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KERALA DEVELOPMENT REPORT: INITIATIVES, ACHIEVEMENTS, AND CHALLENGES

KERALA STATE PLANNING BOARD

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CHAPTER 1

INTRODUCTION

Kerala has been, and remains, the most important example in independent India of the power of public action to improve the well-being of the people and to transform social, political, and cultural conditions in a State. In Kerala, the actions of mass organisations and mass movements against social, political, and economic oppression, and the policy actions of Governments have been the most important constituents of such public action.

The progress made by the State on numerous fronts is based on the strong foundations of earlier achievements in respect of land reforms, health, school education, social justice, gender inclusiveness, and social protection.

When the present Government assumed office in 2016, it inherited an economy that was stagnant in terms of growth and one that had seen little progress in the preceding five years in core areas. Further, the State faced serious resource constraints, basically a consequence of the asymmetry in India's federal system. That the structure of fiscal federalism in India is greatly biased in favour of the Centre is well known. The liberalisation regime has exacerbated the imbalance in the Indian fiscal system. This imbalance is manifested in the mechanism by which resources are shared between the Centre and the States as well as in the decreasing space for borrowing allowed to the State Governments.

Even as the Government of India abandoned Five-Year Plans and disbanded the Planning Commission, the Government of Kerala reiterated its commitment to the planning process. Despite the specific form of capitalist development that now prevails, and despite the constraints that State governments must face, the Government believed that it had to present an alternative to the people. The State government, committed to people's welfare, would address their most important economic, social, and political concerns.

The goal of the Thirteenth Five-Year Plan is a modern, developed Kerala, one that is marked by scientific and technological progress, by the progress of the scientific temper, and by new levels of production and decent employment, particularly for the young women and men who are entering our labour force.

The focus of the 13th Five-Year Plan is to regain the momentum in the economic growth of the State. The strategy for the 13th Plan as a whole included the following:

1. Building a new Kerala through the four missions announced by the Government. In its first year in office, the Government of Kerala put forth a vision of a New Kerala (*nava Keralam*) to be established by means of four important missions, each of which addressed an important area of development. The missions were (i) The LIFE (Livelihood, Inclusion and Financial Empowerment) mission, (ii) the General Education Protection Mission, (iii) the Aardram mission, (iv) the Green Kerala (*haritha keralam*) mission, which focusses on environmental issues.

The missions emphasise sustainable development and people's participation in the following fields:

- i. high-quality school education;
 - ii. people-friendly health facilities;
 - iii. nature-friendly (including organic) agriculture;
 - iv. waste management, a clean environment, and a litter-free Kerala;
 - v. clean water bodies and enhanced water resources; and
 - vi. secure housing and livelihoods.
2. Increasing material production in agriculture and industry.
 3. Generating employment, skill development, livelihood security, and entrepreneurship.
 4. Strengthening Kerala's physical and social infrastructure.
 5. Strengthening the financial infrastructure.
 6. Expanding the role of modern science and technology in society and production, promoting sustainable development, and the modernisation of governance and administration.
 7. Deepening people's planning by local governments.
 8. Extending social protection and the struggle against social exclusion.
 9. Promoting activities centred on heritage, culture, the promotion of tourism, particularly responsible tourism, and building cultural and economic ties with non-resident Malayalis

Thus, the policy of the present Government is to build on the legacy of the State, to defend the historical gains of the people, and to build a secular, democratic, inclusive alternative for social and economic development.

The 13th Five-Year Plan period has been unprecedented. There were extreme weather events: cyclone Ockhi in 2017, and extreme rainfall events followed by floods and mudslides in 2018 and 2019. There was an outbreak of Nipah virus disease in two districts of the State in 2018. There were new stresses on the State economy caused by demonetisation in 2016 and the introduction of GST in 2017.

And in Kerala as elsewhere, the crisis associated with the Covid-19 pandemic has unsettled the economy as never before. The production of goods and services during the Covid-19 pandemic came to an abrupt and almost total halt. Further, the halt to production during the early phases of the Covid-19 pandemic was not locality-specific or scale-specific. Its effects were from top to bottom and across all locations. There was uncertainty about the period that it will take to resume production after the crisis is over. There is still uncertainty about how long it will take to achieve previous levels of production of goods and services, since their resumption involves national and international supply and distribution chains.

Despite the multiple challenges that the State of Kerala has had to confront – with respect to natural disaster, the pandemic, and limited financial resources and other setbacks caused by adverse Central policy – there have been short-term, medium-term, and long-term structural gains in several spheres. This chapter gives an overall introduction to these achievements.

Economic Growth

Kerala's economy grew at a consistent rate of 7 per cent from 2016 to 2019, which is relatively faster than the rate at which the Indian economy grew in 2017-18 and 2018-19. The growth in Gross State Domestic Product and Gross State Value Added exceeded the all-India growth rates, more significantly in 2018-19.

The *Economic Survey* 2020 shows that, despite all the setbacks, the average rate of growth from 2016-17 to 2019-20 (5.4 per cent) was higher than the average rate of growth for the previous four years, 2012-13 to 2015-16 (4.8 per cent).

Table 1 *Gross State Value Added and Gross Domestic Product at Constant Prices, Kerala and India, 2016-17 to 2018-19, in per cent*

Year	Kerala		India	
	Gross State Value Added (at constant prices)	Gross State Domestic Product (at constant prices)	Gross Value Added (at constant prices)	Gross Domestic Product (at constant prices)
2016-17	7.6	7.1	8.0	8.3
2017-18	7.3	6.8	6.6	7.0
2018-19	7.5	7.5	6.0	6.1

Source: Press Note First Revised Estimates of National Income, Consumption Expenditure, Saving and Capital Formation, 2018-19 dated January 31, 2020, MOSPI and Economic Review 2019

The quick estimate of Gross State Value Added (GSVA) at constant (2011-12) prices is Rs 5.01 lakh crore in 2019-20 as against the provisional estimate of Rs 4.89 lakh crore in 2018-19. (Chapter 1, Page 4 of Volume 1). Similarly, at constant (2011-12) prices, the quick estimate of per capita NSDP in 2019-20 was Rs 1,49,563 as against the provisional estimate of Rs 1,45,521 in 2018-19. (Chapter 1, Page 5 of Volume 1).

This consistent rate of growth was achieved in the backdrop of a subdued international and national growth environment. The world economy has been showing signs of low growth, with gross product growth slipping from 3 per cent in 2018 to 2.3 per cent in 2019—the lowest rate since the global financial crisis of 2008-2009.¹ All India growth dipped to 4.2 per cent in 2019-20 from 6.1 per cent in 2018-19.

Economic Planning

Kerala remains the only State to have made a public commitment to continue the planning process. Plans have served as instruments to structure the aspirations of the people into schemes and programmes, and divert the scarce resources of the economy to productive and socially impactful projects.

The Government of Kerala formulated the 13th Five-Year Plan (2017-22), with annual plans to guide the development process in the State. In fact, timely interventions by the Government at times of crises were made possible by reorienting the focus of Plans to address the critical needs of the economy post-floods and landslides.

¹World Economic Situation and Prospects, 2020, United Nations

Table 2 *Plan Outlay and Expenditure, 2016-17 to 2020-21, Rs in crore*

Year	Plan Outlay	Plan Expenditure	Plan Expenditure as per cent of Plan Outlay
2016-17	24000.00	24470.73	101.96
2017-18	26500.00	29896.78	112.82
2018-19	29150.00	26047.32	89.36
2019-20	30610.00	22825.29	74.57

Source: Annual Plans

Sustainable Development Goals

Kerala topped Indian states in progress towards UN Sustainable Development Goals in Niti Aayog's SDG India Index, both in 2018 and 2019. The Sustainable Development Goals (SDG) India Index measures the progress made by Indian States and Union Territories towards implementing the 2030 SDG targets. Kerala ranked first in SDGs relating to health, education, and gender equality in 2018. In 2019, Kerala ranked first in SDGs concerning 'health' and 'industry, innovation and infrastructure' and ranked second in 'education' and 'gender equality.'

Growth of the Productive Forces

Agriculture and Fisheries

When this government assumed office, the year-on-year rate of change in the agriculture sector was negative at -5.1 percent. The growth in crop production was even lower at 7.91 per cent.

Agriculture and agricultural modernisation are key components of the Plan. The emphasis for the agricultural sector in the 13th Five-Year Plan was to enhance productivity, profitability, and sustainability. To enhance productivity, agriculture had to be modernised through science-based inputs and farming practices. Higher profitability meant higher farm business incomes to farmers, and better sustainability emphasised farming practices that keeps in focus the health of the environment.

The agricultural policy of the Government of Kerala has shown results. After consecutive years of decline, annual growth in the agriculture sector increased to 1.72 per cent in 2017-18 with a

0.4 per cent growth in crop production. The production of paddy increased from 5.49 lakh MT in 2015-16 to 5.78 MT in 2018-19. The productivity of paddy increased from 2790 kg/ha in 2015-16 to 2920 kg/ha in 2018-19.

This period saw a leap in vegetable cultivation and production. Area under vegetable cultivation more than doubled from 33425 ha in 2014-15 to 82166 ha in 2018-19, while vegetable production nearly trebled from 4.49 lakh metric tonnes to 12.12 lakh MT in 2019-19. Indeed, the growth further increased to 14.9 lakh tonnes in 2019-2020, an increase of 23 per cent in production compared to 2018-19.

The state government realises that agriculture could be an important staging ground for recovery in the post-Covid economy. It already announced a large-scale agricultural programme that emphasises production, value addition, and marketing.

Kerala's coastline is 590 km long, and the estimated number of fishworkers is 10,44,000. Fisheries is an important sector that received support and saw growth in the past four years. Fish production had declined continuously from 7.27 lakh MT in 2015-16 to 6.73 lakh MT in 2017-18. There was a sharp turnaround in 2018-19 with total fish production increasing to 8.02 lakh MT in 2018-19. Despite the major setback caused by the floods of 2018-19, state-led efforts towards the revitalisation of waterbodies and good fisheries management have also resulted in an increase in inland fish production of about 15 per cent between 2014-15 and 2018-19. Fish seed production has increased from 218 lakh numbers in 2016-17 to 374 lakh numbers in 2018-19, providing a huge impetus for aquaculture.

Industry

A major driver of the improved performance of Kerala's manufacturing sector from 2016-17 onwards has been the turnaround in the performance of PSUs, engaged mainly in the production of chemicals and electrical machinery. This is quite in contrast to the central government policy of promoting public sector privatisation.

The manufacturing sector of Kerala grew at 11.2 per cent at constant prices (2011-12) in 2018-19 compared to 3.7 per cent in 2017-18.

There has been a steady increase in the size of Kerala's manufacturing sector, in value terms, especially so over the last four years. The share of manufacturing in Kerala's GSVA increased

from 9.8 per cent in 2014-15 to 13.2 per cent in 2018-19. According to data from Annual Survey of Industries, Kerala's share in gross value added by India's factory sector increased from 1.2 per cent in 2014-15 to 1.5 per cent in 2017-18. Despite the economic recession, the manufacturing sector of Kerala grew at 1.5 per cent at constant prices (2011-12) in 2019-20.

An important aspect of the industrial scenario lies in presenting Kerala as an attractive destination for industrial investments. Important events like the Ascend 2020 were held to attract investments to the State. Kerala also implemented policy measures to improve the ease of doing business in the State. Kerala Micro Small Medium Enterprises Facilitation Act 2019 is one of the key initiatives under the Ease of Doing Business Reforms of Industries Department for establishing and operating MSME units. During 2019-20, 13,695 MSMEs started with an investment of Rs 1,338.65 crore and they created employment for 46,081 persons.

The Khadi sector in Kerala has registered growth. During 2019-20, the sector provided employment to 13,620 artisans and added cloth and yarn production of Rs 8,575.95 lakh. During 2019-20, Khadi and Village Industries Board could generate 4,135 new employment through the village industries.

Human Development

Education

The visible outcome of the state government's "Public Education Rejuvenation Mission" that started in 2016, and which aimed to raise the quality of teaching and learning in state schools, can be seen in the massive shift of students from unaided to government schools between 2016-17 and 2019-20. In this period five lakh new students sought admission in government and government-aided schools. The last four and a half years saw the Government investing heavily in new-generation public schools throughout Kerala, with the objective of making the best possible school education available to every child in the State.

In many parts of India and the world, school children, particularly underprivileged children, were left stranded by the pandemic. In these circumstances, Kerala made the utmost efforts to reach out to school children and promote academic continuity to them.

Through the implementation of Hi-Tech School project, KITE has converted 44,705 classrooms as Hi-Tech (standard 8 to 12) in 4,752 Government and Aided schools in the State. Smart

classrooms and computer labs for primary classes are nearing completion (Chapter 6, Page 316 of Volume 1).

Despite the Covid-19 pandemic, this year's academic session commenced as in previous years, on June 1, 2020. This was through the digital version of the classes titled 'FIRST BELL' through KITE VICTORS educational channel.

Health

The health scenario in Kerala has been described by international agencies as Good Health at Low Cost and Good Health with Social Justice and Equity. Its health sector has been a model for other States of India not only in terms of gains in the sector, but also in dealing with public health exigencies, as its experience in dealing with the Nipah virus in 2017 and the Covid-19 pandemic has shown.

The Aardram Mission of this Government has improved the functioning of the government hospitals right from the Primary Health Centre to government Medical Colleges. Primary health centres are being converted to people-friendly Family Health Centres. Under the third phase of the Aardram Mission, 212 PHCs were selected for developing into FHCs. In addition, 76 Community Health Centres (CHCs) will be converted into Block Family Health Centers. Because of the improved implementation of the health insurance scheme, more income-poor patients are getting free treatment.

Kerala's Covid-19 containment strategies were varied, and its popular messaging effective. The "Break the Chain" campaign was initiated by the Government to reduce the spread of the virus, through physical distancing, regular hand washing, and use of sanitizers. Mass sanitisation campaigns were conducted, and sanitisers and handwashing facilities were installed in the public spaces. The Government also mobilised its resources to produce hand sanitizers and masks. Special care was accorded to guest workers, or migrant workers from other states.

The GoK created a new health insurance scheme on July 1, 2020 called Karunya Arogya Suraksha Padhathi (KASP) by merging the Pradhan Mantri Jan Arogya Yojana (PM-JAY) with other government-sponsored health insurance schemes viz. Rashtriya Swasthya Bima Yojana (RSBY), Comprehensive Health Insurance Scheme (CHIS), and Senior Citizen Health Insurance Scheme (SCHIS). Implemented under assurance mode for the entire Rs. 5 lakh coverage, a total

of 41.36 Lakhs families are covered under it. About 366 hospitals are so far empanelled, which includes 189 private hospitals and 177 Public hospitals.

Labour

The Government has recognised the importance of guest workers in the State. There were approximately five lakh migrant workers at the time of lockdown in Kerala. They were sheltered in 21,556 camps all over the state, and provided with decent living environs and food. A health insurance scheme was also started for them.

Employment in the organised sector has shown an increasing trend, from 12.1 lakh in 2018 to 12.50 lakh in 2020 (March 31, 2020). In 2020, out of 12.5 lakh persons employed in the organised sector, 5.5 lakh (44.2 per cent) are in the public sector and 6.9 lakh (55.8 per cent) are in the private sector.

Social Schemes

Pensions

Welfare pensions have more than doubled, from Rs 600 in 2016 to Rs 1400 per beneficiary in 2020, with the number of beneficiaries increasing from 35 lakhs to 47 lakhs. Almost one-fourth of these beneficiaries started to receive pension for the first time during the period of this Government. The government announced pensions of two months in advance after the pandemic outbreak. Measures were taken to ensure that the amount reached the home of the beneficiaries without undue delay.

Gender

Though Gender Budgeting has been central to Kerala's plans process since the 11th Plan, it was only in 2017-18 that the first Gender Budget document for the State Plan was released, aggregating resources earmarked for girls/women across departments. More than 10 per cent of Plan funds is allocated for gender development. The gender budget, in fact, constituted 18.4 per cent of the Budget for 2020-21. As a proportion of the Plan, the gender budget has increased from 11.5 per cent in 2017-18 to 14.6 per cent in 2018-19, and then to 16.85 per cent in 2019-20.

For 2020-21, Rs 3809.87 crore has been earmarked under the Gender Budget. Of this Rs 5 crore is earmarked for transgender persons. The Gender Budget is 18.4 per cent of the total State Plan outlay (Chapter 8, Page 424 of Volume 1).

In 2017, the Government started a new department for the welfare of women and children in the State by bifurcating the Social Justice Department. The Department was formed to ensure the physical, psychological, cognitive and emotional development of women and children. Women empowerment programmes and those on gender development are handled by the new department.

The Government of Kerala took up measures to ensure the freedom and safety of women through mechanisms such as Mithra Helpline (181), a 24/7 accessible emergency response service for women in need; the 'EnteKoodu' project that provides shelter for women and children from 5pm to 7am; "She Lodges," a service to ensure accommodation facilities for women travellers; and district-level Pink Patrols and control room for women in the districts. The government brought in a law ensuring that women workers are entitled to safe seating facilities in workspaces.

The inclusion of women in all public spaces, and providing them equal opportunities have been part of the state government policy. Acting on this policy, the Kerala government appointed women sub-inspectors for police stations, and increased the representation of women in the police to 25 per cent. Women police battalions and commando platoons were also established. For the first time in history, 100 women were inducted into Kerala Fireforce Service. Of the total number of persons elected to Local Bodies in the elections of 2020, 54 per cent were women.

Persons with Disabilities

In 2019, Kerala was awarded as the Best State in promoting empowerment among persons with disabilities. The award is in recognition of the innovative projects implemented by the Government for welfare, protection of rights, and empowerment of persons with disabilities. Kerala has adopted a rights-based comprehensive life cycle approach for the welfare of persons with disabilities. The focus of the approach has been undertaking prevention initiatives, early screening, early intervention through District Early Intervention Centres (DEICs) and other health and social sector institutions, education support through special anganwadis, Buds Schools, Model Child Rehabilitation Centres, Special Schools, inclusive education and vocational training, community based rehabilitation and assisted living projects among others.

Service Sectors

Information Technology

The Government of Kerala has made major inroads in the Information Technology (IT) sector in the last four years. The sector saw the entry of world-renowned companies into the State.

The State Government's 2017 IT policy aimed to transform Kerala into a knowledge-based society and leading IT destination that would generate direct and indirect employment opportunities in the sector. It also sought to build the necessary technological infrastructure for the creation of an environment favourable to ICT development, and to enhance the necessary human capital required to both produce and use innovative technologies through education and skill building.

The State received several awards for the Information Technology sector. These include the SKOCH Award 2019 for its e-procurement project; Digital India Award 2019 for initiatives providing comprehensive web and mobile-based services to its citizens; Tech Sabha Award 2019 for co-ordinating flood damage assessment survey process in Kerala; and Governance Now Digital Transformation Awards 2019 for projects such as K- Fi-Digital Infra, Kerala State Portal and m- Keralam mobile app.

Innovations and Startups

Kerala was ranked as the top-performing State in DPIIT's State Startup ranking for the vibrant Startup ecosystem it has created. Under the Kerala Startup Mission, an Integrated Startup complex was created at Kochi, which is one of India's largest innovation hubs with 1.8 lakh sq.ft in area.

There are presently more than 2,500 registered Startups with more than four lakh square feet of incubation space, Rs 1,500 crore external investment, value creation of Rs 1,00,000 crore and an employee base of 25,000. In 2020, 399 Startups were registered in Kerala, showing a growth of 18 per cent over the last year.

The Kerala Startup Mission has been recognised as the world's top Public Business Accelerator by UBI Global, the Stockholm-based intelligence company. To promote innovations in the State, Kerala Development and Strategic Innovation Council has been formed.

Tourism

Tourism was one of the sectors that was badly affected in the last three years. In 2018, it was the Nipah virus scare and the massive floods that deterred tourists. Just as the sector was recovering, floods occurred again in 2019. After both these shocks, the government and the tourism industry have been working together to rebrand the state's tourism sector. This 360-degree marketing campaign included offering attractive packages and an intensive use of online advertising.

The tourism sector rebounded strongly in 2019. There was a 17.2 per cent increase in total tourist arrivals in 2019 compared to 2018. This growth rate of tourist arrivals was the highest after 1995. The growth rate of the inflow of foreign and domestic tourist arrivals, respectively, were 8.5 per cent and 17.8 per cent arrivals in 2019 over 2018 in the State. The total foreign exchange earnings from tourism crossed Rs 10,000 crores for the first time in 2019, reaching Rs 10,271 crore. The total revenue generated from the tourism sector in 2019 registered a 24.1 per cent rise over 2018 to reach Rs 45,011 crore.

BOX 2

Awards received by the State in Tourism

The success of the Tourism sector in Kerala was acknowledged by national and international agencies through awards and accolades. Kerala Tourism won the Pacific Asia Travel Association (PATA) Award for Women's Empowerment, and the Travel Advertisement Broadcast Media and Website award in 2019. The State also received the PATA Gold Awards 2018 for the Best Honeymoon Destination in India, the Lonely Planet Travel Award for Best Destination for Families 2018, and the World Travel Mart Gold Award 2018 for (i) Responsible Tourism and (ii) Managing Success in Tourism. Kerala Tourism also won national-level awards such as the National Tourism Award (2018) for Wayanad Responsible Tourism Project under the Category Best Responsible Tourism Project, and Outstanding Achievement Award for Responsible Tourism Mission at the Indian Responsible Tourism Awards (IRTA 2018).

Infrastructure: A Big Push

Infrastructure development received a push with the revamping of Kerala Infrastructure Investment Board (KIIFB). The revamping of the Board in 2016 significantly altered its scope, power and structure. The Board is an innovative mechanism to build infrastructure by raising funds through extra-budgetary sources, and has the potential to bring about a major transformation in the State by ushering in medium and large infrastructure projects. Some of the major projects financed by KIIFB include the Kerala Fibre Optic Network, Petrochemical and Pharma Park in Kochi, Coastal and Hill Highway, Transgrid 2.0, Life Science Park in Thiruvananthapuram, and the Hi-Tech School Programme. The KIIFB has approved projects of more than Rs 40,000 crore, an investment that will surely pave way for future infrastructure development and economic growth in the State.

The Kollam bypass has been completed and inaugurated, and the Alappuzha bypass work is expected to be completed soon. Construction of Hill Highway and Coastal Highway is progressing. KIIFB sanctioned Rs 1726.397 crore worth projects covering 21 reaches of Hill Highway.

Kerala will become the first State in the country to deploy electric vehicles (EVs) for enforcement activities. The Motor Vehicles Department (MVD) has placed orders for plug-in electric vehicles for 65 Enforcement Squads of the Safe Kerala project for enforcing motor vehicles rules and to ensure road discipline.

KAL is the only PSU having got the CMVR (**expand**) certification for electric autos. KAL has enhanced its production capacity from 7,200 units to 15,000 units per year, and has even received export orders from Nepal.

The “Vega 2” High speed AC passenger boat (120 Pac) was launched between Alappuzha-Kumarakom-Kottayam (Chapter 11, Page 551 of Volume 1).

Local Governments: Unleashing People's Potential

In 1996, The LDF Government initiated the first phase of the People's Campaign to make Kerala a model in devolved governance. In 2016, the second phase of the People's Campaign was launched to further strengthen local governments. In the past four years, local governments

have streamlined the planning process and improved the implementation of Plans, recording high levels of plan expenditure. A notable feature of this period has been the formulation of District Plans.

Local Governments have and are playing a crucial role in times of crises, like during the floods and other distasters of 2018-2019, and in the management and containment of the Covid-19 pandemic.

The recently held election to local bodies in the State in December 2020 has brought in new governments at the helm of affairs in all the tiers of government.

At present, there are 1200 local governments in Kerala, which includes 941 Grama Panchayats, 152 Block Panchayats, 14 District Panchayats, 77 Taluks, 87 Municipalities and 6 Municipal Corporation.

The frontline role played by local bodies and their elected representatives during the Covid-19 pandemic has been widely appreciated by the people of Kerala. Some of the noteworthy activities of local bodies in this period include: the establishment and management of community kitchens during lockdown; cleaning and disinfection activities; organizing and running “break the chain” and social distance campaigns and awareness programmes; providing accommodation, food and other essential support to migrant (“guest”) workers; coordinating home quarantines, counselling and isolation; establishing institutional quarantine for persons returning to Kerala from other parts of India and abroad; establishing and managing Covid First Line Treatment Centres; engaging personnel in health institutions managed by Local Governments; purchasing medicines and other equipment for hospitals run by Local Governments; distributing free medicines; implementing local economic plans to help people who lost jobs; increasing food production and self-sufficiency in the field of agriculture under the Subhiksha Keralam programme; and making arrangements for local dissemination of internet connectivity for schoolchildren.

Community Action to Revive Water Bodies

The Haritha Keralam Mission has done excellent work in water conservation and water preservation during the last four years in the form of river rejuvenation and cleaning activities at the water source. A total of 390 km of rivers and 41,529 km of streams were rejuvenated. Without the enthusiastic participation of people, the task of rejuvenating major rivers could not have been possible by the government. For example, a massive rejuvenation campaign was held on May 12, 2018. The campaign saw the participation of about 50,000 people from various spheres, including the general public, residence associations, neighbourhood groups, self-help groups, schools, clubs, government officials, Kudumbashree groups, youth organisations, and people employed under the National Employment Guarantee Scheme.

Cooperatives and the Kerala Bank

Cooperation and primary cooperatives are Kerala's strength, a rich legacy of our freedom movement. People's confidence in these institutions is part of Kerala's historical heritage. Today, these institutions form the backbone of much rural economic activity in the State. One of the major achievements of the present Government has been strengthening of the cooperative system by forming the Kerala Bank, which will be one of the largest banking networks in the State, in 2019. The new Bank has been formed by merging all the District Cooperative Banks with the Kerala State Co-operative Bank.

A Co-operative Policy was formulated for the first time in the State in 2019-20. The policy envisages a focused development for the co-operative sector with the view to ensure sustainable development of the State

Engagement with Kerala Diaspora

The Government took important measures to increase its engagement with the Kerala diaspora by forming the Loka Kerala Sabha. The Loka Kerala Sabha aims to promote the unique culture and heritage of Kerala among Malayali expatriates. It comprises all members of the State Legislature, Members of Parliament representing Kerala, and persons elected from non-resident Keralites NRKs living within and outside India. The Loka Kerala Sabha will provide a forum to voice the concerns of Non-Resident Keralites (NRKs) and also contribute towards policy formulation.

The first Loka Kerala Sabha was held in 2018. The event brought together persons of eminence in various walks of life to discuss issues concerning Kerala's diaspora.

Resilient Kerala

The State of Kerala has demonstrated an exceptional capacity to deal with crisis. The floods of 2018 saw public action reach new heights. The Government responded to the crisis swiftly, undertaking immediate rescue and relief work. The speedy, meticulous, and people-oriented handling of the crisis by the State won admiration from all over the State – and from other parts of India and the world.

After floods of 2018, the Government laid out a vision for a more climate-resilient State. The crisis was seen an opportunity to rebuild, ensuring better standards of living to all sections of society. As part of this effort, the Rebuild Kerala Initiative was started. Responding to the need of the hour, the Government formulated a Livelihood Development Package to revive the livelihoods lost in the floods. In 2019 and 2020, the Government took adequate precautions to minimise the loss to lives and livelihoods by instituting early warning systems in the State.

Managing the Pandemic

The Government of Kerala took early action with respect to the pandemic. The State was the first to announce a substantial programme, much ahead of other States and the Central Government, to address the anticipated economic impact of the Covid-19 pandemic in the form of a Rs 20,000 crore package.

The many-sided response of the state is discussed in detail in another part of this report. Among the highlights that is that the Government set aside Rs 1,320 crore to disburse welfare pensions in advance for two months in March 2020. Another Rs 100 crore was allocated to provide Rs 1,000 each for families that were not eligible for welfare pensions. In the subsequent two months, Rs 2,000 crore was disbursed as loans through the Kudumbashree scheme, with the State Government bearing the interest component. In addition, Rs 2,000 crore was set aside to provide jobs under the employment guarantee scheme.

The State Government created a five-tier structure outside the health infrastructure comprising home quarantine, Domiciliary Care Centres, Covid First-Line Treatment Centres, Covid Second

Line Treatment Centres and designated Covid Hospitals. These provided care and support to Covid patients. Covid treatment was made free in Government hospitals, including testing. At all times, food was also provided free of cost to all patients. In addition, psychological support was also provided to all Covid positive patients and other persons in quarantine through dedicated psychological support team.

To sum up, the hallmarks of Kerala's response to Covid 19 included a strong public health infrastructure built under Aardram Mission, information dissemination at the highest level spearheaded by the press conferences of the Chief Minister, at which he provided up-to-date information on the status of the pandemic and government action. It included provisioning of food and shelter to the needy in the most difficult times.

The Health Department also launched e-Sanjeevani telemedicine services in Kerala on June 10, 2020. They provide services in a centralised manner. DISHA is the State hub managing the telemedicine activities for the State.

In every one of the crises it has had to face, the Government of Kerala put people's welfare at the centre of its policy response. With respect to the State's response to the pandemic, as early as May 2020, one of India's most senior journalists wrote thus of Kerala's policy approach:

The government gave four assurances to the people and implemented them in letter and spirit. It also did so with complete transparency. First, no one would go hungry and without a safety net of essential commodities and services. Every agency and arm of the government, backed by armies of volunteer citizens, worked hard to deliver on this promise. Secondly, nobody would go without shelter. The way the State looked after large numbers of highly vulnerable migrant workers was certainly a model for other States and also for the central government. Thirdly, everyone would have access to the health system, with its three tiers, as needed. The government's policy approach was unwaveringly to follow the science . . . Free testing was part of the Kerala safety net. There is some evidence to show that proactive testing in the early days of the COVID-19 outbreak helped to flatten the curve and keep the number of cases at a low or manageable level . . . Fourthly, there would be a free and continuous flow of information, as befits a State that takes the rights of its citizens seriously. Chief Minister Pinarayi Vijayan's daily press conferences and the constant communication the government maintained with the people at large built and sustained trust at a high level. (Ram, 2020)

This Report deals with the initiatives and achievements of the Government and people of Kerala, and with the challenges that they face. It is a description and analysis of economic policy and development in Kerala, with an emphasis on the years from 2016 to 2020.

CHAPTER 2.1

'KERALA'S HEALTH: SOME PERSPECTIVES FOR FUTURE DEVELOPMENT'

Despite scholarly debates Kerala model still continues to attract national and international communities with its higher achievements in social development. One of the core areas, among others, where the south Indian state has excelled other Indian states consistently is the health sector. Kerala has consistently topped the list of Indian states in health sector for its palpable achievements with high life expectancy, low infant mortality and low birth and death rate. In the latest report by NITI- Ayog (2019) on the performance of Indian states in the achievement of Sustainable Development Goals (SDGs) Kerala has secured the top position with a score of 74 out of 100. Kerala's excellent achievement in the health sector is not a new or recent phenomenon, but it is already an acknowledged fact. In 1991 for example when the national Infant Mortality Rate crossed 74 the same had remained 13 in Kerala. The same has consistently recurred in other health indices as well making a comparison of the national and other states' averages with Kerala's achievements a difficult task. Kerala became a model for the right kind of social policies that ensured balanced, equitable development, and a steady improvement in health indices. The latest SDG report confirms that the State has maintained this path, despite many setbacks. This achievement, to a certain extent, is attributed to the post independent governments' progressive developmental policies in the erstwhile Travancore and Cochin kingdoms. But Kerala's achievements in health sector are highly attributed to the deliberate policies followed by the post independent successive governments. Kerala is the first state in the country to have its own Palliative Healthcare Policy, formulated in 2008, which led to the integration of infrastructure and partnerships for providing palliative healthcare services within the State's health system.

While Kerala remained literally the only state with a positive sex ratio – with more females than males in its population – there was sharp decline in the rates of fertility, infant mortality etc., from the 1970s itself. The early entry of the state into the third phase of demographic transition signifies its enduring ambitions to remain a welfare oriented state from the beginning. The fact that this did not coincide with large scale industrialisation differentiate Kerala's experience from other countries, especially those in Europe and North America. This scenario has indeed radically transformed with the emergence of neoliberal policy making since the 1990s. The state economy has grown several times further with shifting priorities. Private sector has emerged as a key factor in the area of healthcare. This coincided with the increasing pressure on governments to gradually withdraw from this area. This being a national and global trend the governments in Kerala nevertheless sustained the large investments in public healthcare which has seen a further boost in the last five years.

The result of such keen attention being paid to healthcare is that Kerala still far surpasses other Indian states and the national average by miles in health indices and Kerala's health sector has been a benchmark for other states due to significant gains in health indices such as high life expectancy, low infant mortality, birth rate and death rate. As per the latest Sample Registration System (SRS) the infant mortality rate of Kerala has come down to seven per 1000 live births,

even surpassing the UN set target goal (SDG) of eight, while the national average remains at a dismal 32. Same has remained in the case of all other health indicators signifying large differences. The maternal mortality rate, another example and an important indicator, is at 43 in Kerala comparing to the national average of 113. The achievements of Kerala's health status compared to national scenario are clearly reflected in the health and demographic indicators (see Table 1). Expectancy of Life at Birth in Kerala is much higher than the figures for India. Percentage of death not receiving medical attention of qualified professionals is only one-fourth compared to national average. Percentage of live births without medical attention of qualified professionals received by mothers in Kerala is only 0.1 against 7.8 at national level.

Table 1: Demographic and health profile of Kerala in comparison to all India level

1	Indicators	Male/Female	Kerala	India
	Infant Mortality Rate [#]		7	32
		Male	9	32
		Female	5	33
2	Maternal Mortality Ratio**		43	113
3	Expectancy of Life at Birth***		75.3	69.4
		Male	72.5	68.2
		Female	77.9	70.7
4	Percentage of deaths receiving medical attention*		95.5	80.8
5	Percentage of live births by type of medical attention received by mothers*		99.9	92.8

Source: # SRS 2020 May/* SRS Statistical Report 2018

**Special Bulletin on MMR 2016-18

***SRS Life Table 2014-18

Emerging Health Problems/ challenges of Kerala- since 1990's

Even with the national and international level achievements made by the State in health sector, the main challenge is to sustain the gains achieved. Further, the State is also facing problems of life style diseases (non- communicable diseases), increasing morbidity, emergence and re-emergence of communicable diseases, large scale privatization and health problems of elderly. Other than these, there are new threats to the health scenario of the State like mental health problems, suicide, substance abuse & alcoholism, adolescent health issues and rising number of road traffic accidents. The health status of the marginalised communities like tribes , fisher

folks, scheduled caste and plantation workers still continues to be poor compared to the general population.

Increasing Morbidity: A state-wide study, undertaken by Kerala Sastra Sahitya Parishad (KSSP), a state-wide NGO, showed that reported sickness in Kerala was high. Chen and others have pointed out that the 'perception' factor may be at work in increased morbidity in Kerala: perhaps owing to the high levels of education, more people may perceive themselves to be sick, compared to other states in India. (3). Several rounds of the National Sample Survey Organisation's (NSSO) surveys have pointed to the high level of reported acute sickness and the high level of access to Kerala's health facilities compared to other Indian states.

Burden of lifestyle diseases: Unless we intervene to prevent and control non-communicable diseases, their burden is likely to increase substantially in the future due to the aging population and changes in lifestyle. The high cost of medicines and longer treatment duration constitutes a more significant financial burden to low-income groups. In India, it is estimated that 42 percent of total deaths are due to NCDs. In Kerala, the situation is more severe as more than 52 percent of the total deaths between the productive age group of 30 and 59 are due to NCDs. Incidents of obesity, hyperlipidemia, heart attack, and stroke are also high. Compared to the national average, cancer mortality is exceptionally high in males in Kerala. Every year, 35,000 new cancer cases are getting detected in Kerala, and Nearly 1 lakh people are under treatment for cancer. As per the 2011 Census of India, 0.20 percent of Kerala's population suffers from mental illness, and 0.20 percent suffers from mental retardation compared to a national average of 0.06 percent and 0.12 percent, respectively. Lack of awareness, the general public's attitude, neglect of family members and lack of proper follow-up, etc., are the significant problems noticed.

Emerging and Re-emerging communicable diseases: Apart from these 'lifestyle' diseases, which could be ascribed to large scale transformations in society, Kerala also witnessed the resurgence or appearance of many infectious diseases: epidemics of dengue, chikungunya, leptospirosis, and hepatitis became an annual feature in the State. There has been a shift towards the diseases like dengue, chikungunya, leptospirosis, scrub typhus, Japanese encephalitis, etc. The major reasons for this transition are lack of proper public health policy and co-ordinated local level action for waste management, safe drinking water, and food safety.

Health problems of the elderly: As life expectancy increased, our population's age structure has shown a demographic shift towards an increase in the proportion of elderly. Kerala has the highest proportion of people above the age of 60 years (11.8% as in 2011), which is expected to increase to more than 20% in the forthcoming years. This has contributed to an increase in the prevalence of chronic diseases like cancer and other lifestyle diseases.

Large-scale privatization: The private sector has grown in an environment of poor regulation, high demand for services, and availability of investible funds. Studies point out that Kerala now has one of the highest per capita health and hospitalization (9). Though the private sector has infused modern technology and the latest initiatives in medical care to those who can afford it, in many instances, it is responsible for services of unverified quality peddled to an unsuspecting public through advertising and other inducements.

To tackle these above mentioned issues, concerted and committed efforts with proper inter sectoral co-ordination are essential. Through the recent health policy of the state and the efforts through Aardram Mission, the health scenario of the state is envisaged to be completely transformed.

Policy Interventions- Approach and initiatives under 13th Five Year Plan

Partly as a response to the crisis in health institutions, in 1996, the government of Kerala initiated a bold policy move bringing health institutions such as primary health centers (PHC) and community health centers (CHC) under local self-government (LSG). The expectation was that this would result in the more accountable and efficient running of health institutions. It was also expected that public health, health promotion, and inter-sectoral initiatives in health would thrive through the planned interventions at each local body level. In practice, however, many institutions focused on improving health care facilities, which was directly demanded by the population and this had improved the infrastructure and service in primary and secondary healthcare institutions and widened healthcare delivery. But even after the 25 years of decentralised planning, there exist some systemic deficiencies in the public health institutions and fundamental alterations are warranted to make them genuinely pro-people and patient-friendly.

Hence, *13th Five Year Plan approach* is to provide the best possible preventive, curative, and palliative care in the public sector by improving the infrastructure and quality of the services. By envisaging the successful implementation of Aardram Mission, the approach paper focuses on making Primary Health Centres as Family Health Centres, providing quality treatment services at secondary level and creating a patient friendly environment in government hospitals. Expansion of insurance coverage, achievement of total sanitation, waste disposal and mosquito eradication are some of the other aspects given priority for achieving the healthy life of all segments of population in the state.

Following the global path for attaining sustainable development goals, Kerala's present government promulgated its health policy early on in the course of its tenure. The *Health Policy* of Kerala gives emphasis on strengthening the primary health sector of the State which would play a pivotal role in detection of the diseases and the need for strengthening disease surveillance at the grass root level to prevent the spreading of epidemics. Apart from strengthening the treatment facilities, the policy looks into the need for giving thrust for disease prevention. The policy envisages establishing a publicly funded, free, universal and comprehensive health care system, bringing infant, child and maternal mortality to levels in developed countries and to increase the healthy life expectancy of the population.

The objective of 'Aardram' mission is to deliver patient-friendly quality health care services in Government Hospitals and to add specialty and super specialty facilities in District and Taluk Hospitals. It also envisages developing Primary Health Centre into Family Health Centres, capable of meeting the healthcare needs of all members of the family through personalized service packages and to address the preventive, promotive, curative, palliative, and rehabilitative health care interventions of the local community. When fully functional, this will enable a Web-based appointment system, patient reception, and registration, electronic display boards for each consultant, the facility for patient to wait for their turn, improved amenities in the waiting areas,

location maps and signage, etc. it also envisages to improve clinical management by ensuring guideline-based case management and monitoring quality of services provided. The highlight of this transformation is that the LSGs play the most crucial role in the functioning of family health centers. Availability of drugs has improved at the PHC level, and the government has been recruiting manpower in health despite several Financial setbacks induced by successive years of Flood and the onset of the recent pandemic of Covid 19. Supportive institutions such as the Kerala Institute of Virology have been set up to improve the capabilities in the public sector to deal with catastrophes and emergencies in health.

Achievements under Aardram Mission

The Aardram Mission was started in order to make Government hospitals people-friendly by improving their basic infrastructure and capacity to provide services. The mission aims to improve the efficiency of service and facilities in the Government hospitals with a view to extend treatment at a reasonable cost, time and satisfaction. The major objectives of the mission are: (i) Patient friendly transformation of the outpatient (OP) wings of medical college hospitals and other Government hospitals, (ii) standardisation of the District and taluk level hospitals, (iii) developing the PHCs into FHCs in a phased manner and (iv) ensuring protocol based treatment guidelines in the management of patients in hospitals.

Aardram Mission is implemented in three stages in Government medical college hospitals, District hospitals, taluk hospitals and primary health centres (PHCs). The conversion of PHCs as family health centres (FHCs) with adequate supply of drugs and assured treatment protocols would ensure better health among people and enhance their trust in the public health system.

PHCs and CHSs as Family Health Centres

In the first phase in 2017-18, Government identified 170 PHCs covering all 14 Districts for developing into Family Health Centres. Out of this, 162 FHCs are already made functional and the rest is progressing. In the second phase in 2018-19, 504 PHCs were selected for developing into FHCs in which 315 have been completed and works are progressing in other PHCs in different stages. Transformation of the PHCs into FHCs has evoked encouraging community response. In the third phase 212 PHCs were selected for developing into FHCs using funds under National Health Mission. In addition to this 76 Community Health Centres (CHCs) will be converted into Block Family Health Centre

People friendly OP transformation of District level Hospitals

Aardram Mission aimed to transform all district hospitals as institutions which provide all basic specialty services and essential multi-specialty services. The specialty services include new born care, psychiatric services, physical medicine and rehabilitation services, accident and trauma services, dialysis services and anti-retroviral therapy.

Considering the fact that medical college hospitals and District level hospitals are larger institutions providing outpatient care for a large number of patients every day, patient friendly transformation of the outpatient wings of these hospitals was taken as a priority item under

Aardram Mission. Outpatient transformation with adequate OP registration counter, patient waiting area, adequate seating facility, token system with other amenities like drinking water, toilet facilities, public address system, information education and communication arrangements and signage systems are being incorporated. Support of patient care coordinators for larger institutions on a temporary basis would also be provided. For ensuring quality medical care, OP computerisation, providing adequate facilities in the consultation rooms and a guideline based case management are planned. These are being implemented in Government medical college hospitals and at District level hospitals.

There are a total of 18 General hospitals and 18 District hospitals in the States. Out of this only 17 institutions have been selected for OP transformation (one hospital each in 11 Districts and two hospitals from Kannur, Kasaragod and Wayanad Districts). The construction work of 9 hospitals has been completed. The work in other hospitals is progressing well. Out of the total 86 Taluk hospitals, 75 institutions are selected for standardisation in a phased manner.

Setting Up of Specialty Services in District level hospital through KIIFB

As a part of enhancing the district level hospitals as institutions which provide essential specialty services, cath labs, dialysis centres and CCUs have been set up in district and taluk hospitals through KIIFB. For this purpose, an amount of Rs.150 cr has been provided to incept 44 dialysis centres and 10 cath labs and CCUs. 98 percent works of dialysis centres and 80 percent works of cathlabs and CCUs have already been completed while the balance works are expected to be completed by July 2021.

Table. 2 Setting up of Cath Labs and Dialysis Units (through KIIFB)

Project	Dialysis Centres	Cathlab and CCU
Total Outlay (Rs in cr)	69	80
No. of Centres	44	10
Started Functioning	41	8
Completed	2	0
Progressing	1	2

Source: DHS

Transformation of Medical Colleges

Aardram Mission is aimed to provide patient friendly and quality care services to the outpatient wing of Medical Colleges. As a first step, Medical Colleges at Thiruvananthapuram, Paripally, Alappuzha, Kottayam, Ernakulam, Thrissur, Malappuram and Kozhikode were selected for the implementation of OPD Transformation. The works in 8 Medical Colleges have been completed. The main components of the projects are to make online registration so that patient need not spend more time at hospital, constructing new OP waiting areas, providing drinking water facilities, renovation/reconstruction of toilet blocks, OP rooms for all departments, proper signages to different services, TV and display board, airport Chairs, PA system, providing air conditioners in OP rooms, and providing ramp.

Table 3 Status of Infrastructural Development in Hospitals under Aardram Mission

Type of Hospitals	Phases	Total Institutions	AS Issued	Work Completed	Work Progressing
PHCs into FHCs	1st Phase	170	170	163	7
	2nd Phase	504	432	315	117
	3rd Phase	212	212	0	212
	<i>Total</i>	<i>886</i>	<i>814</i>	<i>478</i>	<i>336</i>
OP s of District level Hospitals	1st Phase	8	8	1	7
	2nd Phase	18	18	0	0
	3rd Phase	10	10	0	0
	<i>Total</i>	<i>36</i>	<i>36</i>	<i>1</i>	<i>7</i>
Medical Colleges	1st Phase	8	8	8	0

Source: Directorate of Health Services

Human Resource Development/Expansion in Health Sector

For implementing the Mission activities, additional posts of one medical officer, two staff nurses and one lab technician each were created in all FHCs. These posts were filled in order to ensure that there will be a minimum of 3 doctors and 4 nurses in the FHCs. In the first phase of Aardram Mission, 830 posts were created consisting of medical officers (170), staff nurse (340), pharmacist (150) and lab technician (170). In the second phase 1000 posts have been created consisting of medical officers (400), staff nurse (400), pharmacist and lab technician (200). Recently 1217 posts have been created (in the cabinet meeting held on 17-02-2021) of which detailed staff positions are yet to be available.

Table 4
Additional Posts Created in Health Services and under Aardram
(From 2016 to 15-01-2021)

Post	Total Health Services	Aardram Mission
Doctors//Medical Officers	982	836
Nurses	1042	937
Pharmacist	189	180
Lab Technician	677	460
Others	470	308

Total*	3360	2721
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- While adding the recently created 1217 posts, a total number of posts created during this 5 year period comes to 4577.

Service delivery of these institutions in terms of clinical care and public health activities have been augmented and outpatient care is provided in the afternoon upto 6.00 PM. Through the implementation of e-Health project, it is expected to further develop individual patient care plan and family health plan based on family health register data. Ward and Panchayat level health plan focusing on preventive, promotive and rehabilitative health care services would be developed in association with Panchayats and with public participation. A new health volunteer system called Arogyasena is being launched as part of Aardram mission. Public health interventions focusing on the re-organisation of the primary health care system based on the epidemiological needs of the Kerala society especially combating the challenge of non-communicable diseases constitute the focus areas of the programme. Treatment guidelines for 53 common medical conditions to be managed at PHC level have been prepared and made available for Medical Officers.

Post creation in District/General/Taluk hospitals in 2017-18 was 891 consisting of 14 Super Specialists, 252 Specialists and Casualty Medical Officers, 197 Staff Nurse, 84 Lab Technicians, and 344 Paramedical Staff.

Training status: Revised job responsibilities and FHC transformation guidelines have already been prepared and module based trainings have been initiated for major categories of staff. Providing comprehensive and continuous training for all category of staff is the policy of the Government to ensure quality of service delivery. To achieve this, State Health Systems Resource Centre (SHSRC) Kerala has been entrusted with the responsibility of training. Three types of training are ongoing namely, team building training, concept based training and skill training.

Aswasam clinics: Aswasam Depression management in Primary Care was started in 149 Family Health Centres across the State. Health workers and staff nurses were trained in screening using PHQ9 and psychological first aid, while doctors were trained in diagnosis and management of depression at Primary Care. Referral Protocol for cases to be seen by DMHP psychiatrist is included in the programme. Number of persons screened in 2019-20 was 25,587 in which number of positive cases was 4901.

Kerala COPD Prevention and Control Programme – SWAAS: Chronic Obstructive Pulmonary Disease (COPD) control programme called SWAAS is implemented from Family Health Centre level onwards in Kerala as part of Aardram Mission. Details are given in the section on 'Non Communicable Diseases' in this chapter.

Aardram People's Health Campaign : Aardram Peoples Health Campaign was launched on November 18, 2019. Following the States level launch, District level and LSG level launching of the campaign have been started in all Districts. This States-wide campaign will be implemented locally under the leadership of respective LSG and Health and Family Welfare Department with active involvement of Missions, line departments/agencies, NGOs, and CBOs. Local level implementation of the campaign starts from the ward level under the leadership of expanded

Ward Health Sanitation and Nutrition Committee (WHSNC). At the Panchayath/Block/Urban area level it will be under the leadership of expanded Arogya Jagratha Committee. District level implementation will be through the coordination of LSG level committees, existing District Health and Family Welfare Society, District Aardram Task force headed by District Panchayath President, District Collector and DMO (Health). Minister in charge of the District, MP and MLA of the Districts would be the chief patrons of the District level committees. At the States level, leadership and guidance for the campaign will be given by Nava Kerala Karma Padhadathi Committee chaired by the Chief Minister along with other ministers and other members. State Level Implementation Committee is functioning under the leadership of Minister for Health as Chairperson and Principal Secretary (Health) as Vice Chairperson. Following are the five areas of focus in this people's campaign:

1. Preventive and promotive health and improvement in health seeking behaviour.
2. Healthy Food
3. Exercise and physical activity promotion
4. Mental health and de-addiction (Alcohol, smoking and substance abuse)
5. Cleanliness and waste disposal

e-Health Project :The e-Health Project targets to link health institutions all over Kerala. The project aims to build a database of individual medical records easily accessible to the medical practitioners. It includes unique patient identification in different settings and exchange of data between different health care delivery units at primary, secondary and tertiary level across State. This could avoid the repeated medical tests and can thereby reduce out of pocket expenses arising out of rush to clinics and labs. The scheme is being implemented in all the fourteen Districts of Kerala with Thiruvananthapuram as the pilot District. E-health is completed in 140 hospitals in which 63 are working as paperless hospitals. Niti Aayog has appreciated the e-health project of the State. Kerala is the only State in the country where the data base of 25921080 people has been collected and stored as electronic records.

Investment in Health Sector during 13th Five Year Plan

Studies have pointed out that the rate of rising in per capita out-of-pocket health expenditure during 1987-2004 has been more than double the rate of growing in cost of living indices. The out of pocket expenditure in health is above 80% in Kerala. Globalization and privatization challenged the foundations of the Kerala model of low-cost health care, which was primarily built on distributive justice. In order to address this issue, a large amount of fund has been pumped into health sector both in terms of budget allocations, KIIFB and RKI.

Both plan as well as non-plan expenditure on health have increased over these five years and in 2020-21, government has spent more than what was estimated in the budget due to unexpected huge demand happened because of pandemic. An addition of more than Rs.2500cr has been spent in 2020-21 in comparison to the year 2017-18.

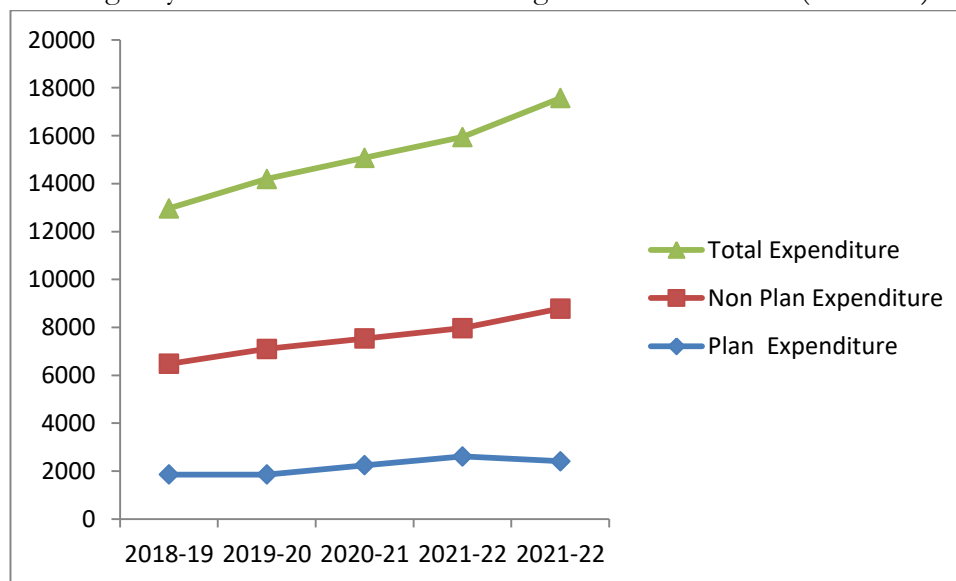
Table 6
Investment in Health and Family Welfare (Rs in crore)

Year	Revenue Expenditure			Capital Expenditure			Total Expenditure		
	Plan	Non Plan	Total	Plan	Non Plan	Total	Plan	Non Plan	Total
2017-18(ACC)	1593.55	4580.85	6174.4	269.4	38	307.39	1862.95	4618.85	6481.79
2018-19(ACC)	1640.16	5206.89	6847.05	222.6	28.91	251.51	1862.76	5235.8	7098.56
2019-20(ACC)	2024.97	5269.62	7294.58	221.64	22.59	244.23	2246.61	5292.21	7538.81
2020-21(RE)	2476.33	5289.98	7766.62	138.53	65.68	204.19	2614.86	5355.66	7970.81
2021-22(BE)	2261.72	6283.21	8544.94	151.42	85.18	236.6	2413.14	6368.39	8781.54

Source: Budget in Brief

The steady increase of budgetary investment both in terms of plan and non-plan expenditure is shown in the figure.

Figure 2
Budgetary Investment in Health during 13th Five Year Plan (Rs. In Cr)



Source: Budget in Brief

Investment through KIIFB

KIIFB, which was launched for financing infrastructure projects in the state, is being instrumental in setting up a wide range of infrastructure development projects under health sector since 2016. Projects with an amount of ₹ 4,240.12/- have been approved by KIIFB and out of these, projects with an amount of ₹ 1,503.42 have already been started. Specialties like cath labs and dialysis centres in district and taluk hospitals could be materialised with KIIFB fund as given the previous sections.

Table 7 Status of KIIFB Approved projects

KIIFB Approved Projects	No. of Projects Approved	57
	Approved Amount (Rs.in Crore)	₹ 4,240.12
KIIFB Tendered Projects	No. of Projects Tendered	28
	Approved Amount of the tendered projects (Rs.in Crore)	₹ 2,471.65
	Tendered Amount (Rs.in Crore)	₹ 1,703.59
KIIFB Started/Awarded Projects	No. of Projects Started/Awarded	24
	Approved Amount of the projects Awarded (Rs.in Crore)	₹ 2,049.63
	Work Contract Amount (Rs.in Crore)	₹ 1,503.42

Source: KIIFB

The projects so far approved for financing are currently under various stages of execution. Some of the major projects of KIIFB under health sector are listed below:

1. Development of Govt. Medical College, Thiruvananthapuram –Improving External Infrastructure and Construction of new OT cum Surgical Ward Block, SAT Paediatrics Block and MLT Block

The first phase development is for improving the external infrastructure including development of internal roads, construction of multilevel parking system, traffic regulations, junction improvements, measures for pedestrian access & safety etc. and Rs.58.37 crore has been approved by KIIFB for this purpose. The project under Phase II has been proposed for the development of Govt. Medical College, Thiruvananthapuram which includes construction of OT cum surgical ward block, paediatrics block and academic block for MLT with a total estimated cost of Rs.194.33 crore. INKEL Ltd is the SPV designated for executing the project.

2. Development of Malabar Cancer Centre, Thalassery Phase-I & Phase-II

The Phase-I project is for the upgradation of MCC as a Post Graduate Institute of Oncology Sciences and Research which shall provide infrastructure of state of art facilities with high quality teaching. The existing hospital lack modern diagnostics and therapeutic equipment, proper emergency service and intensive care units, essential pharmaceuticals and supplies, referral support and resources. There are also space constraints for many departments in the hospital. The scope of work includes construction of new radiotherapy block renovation of main OP building and site development works. The renovation works mainly includes demolition of existing partition wall and leaky toilets and providing new partition wall. Provision of false ceiling, Orthopaedic OP, roofing for open terrace courtyards etc. Site development works includes Rainwater tank, interlocked paved parking, Covered parking, drain, retaining wall etc. The Phase-I works were approved for Rs.75.18 Cr and M/s BSBL is the SPV for the project. KIIFB has also

approved the project submitted by M/s WAPCOS Ltd (SPV) for its Phase-II components like construction of 14 floor hospital building & supporting infrastructure for a total estimated cost of Rs.345 cr.

3. Construction of Cancer Hospital & Research Centre at Govt. Medical College Campus, Kochi

Primarily, cancer treatment facilities are available largely in the tertiary hospitals. Decentralization of the cancer treatment from tertiary hospitals to district/general hospitals will promote early detection of cancer and could be cured large number of cases. Every year 35,000 new cases of cancer are detected in Kerala. The proposed project at Kochi would reduce the burden on RCC, Thiruvananthapuram. The project shall come up in the 12 acre campus in phases. The first phase shall have four blocks, viz., Medical block, Administration block, Services block and Pain & Palliative care block. The total estimate cost approved by KIIIFB for the project is Rs.379.73 Cr and M/s INKEL Ltd is the SPV.

4. Development of Government Medical College, Thrissur

The project approved by KIIIFB includes the construction of a Super specialty block, Connecting passage, development of Ancillary and supporting facilities (Water Supply, Water Conservation & Wastewater Management, Power Supply, Solid Waste Management, Ancillary Facilities, etc.). M/s InKEL is the SPV and the estimated cost for the project is Rs.153.25 cr.

5. Establishment of International Research Institute for Ayurveda - Phase 1

The lack of a dedicated Ayurveda research institute in the state has triggered Government to plan such a research institute with state-of-the-art facilities in the state. The project is intended to promote research work linking Ayurveda with biotechnology and to ensure global standards for Ayurvedic medicines. The Phase-I project includes construction of new 100 bed hospital building, Manuscript building and Nursery building. The hospital building consists of Administrative department, Radiology department, Outpatient department and Services, Rooms (single room, VIP suit, double bedroom and five bed ward), therapy rooms, treatments rooms, Relaxing room (Jacuzzi, Sauna etc), diet kitchen, dining, pharmacy store, central store, meeting room etc. Manuscript building consists of Climate controlled storage chamber for manuscripts, Preservation laboratories and store, Digitalization lab, Special reading chamber, Offices, Digital access library, Digital display area, Conference rooms and Manuscript display area. The nursery building consists of a small laboratory, seed centre, staffroom etc. M/s KITCO Ltd is the entrusted SPV and the total estimated cost for this phase comes to Rs.153.25 cr.

Increase in Hospital Beds and People's Dependence on Government Hospitals

One of the objectives of Aardram Mission is to transform the public health sector making it patient friendly and affordable for the poor and ordinary citizens of our State. The government has designed various strategies to provide an effective healthcare system to the people in the public domain with better infrastructure and quality services. One of the direct outcome of the government's efforts through Aardram Mission is that people's dependence on government hospitals has increased largely since the facilities in Family Health Centres as well as district level hospitals have been enhanced. As seen in Table 5, apart from the transformation of primary, secondary and tertiary institutions, the total number of hospital beds has increased over these five years.

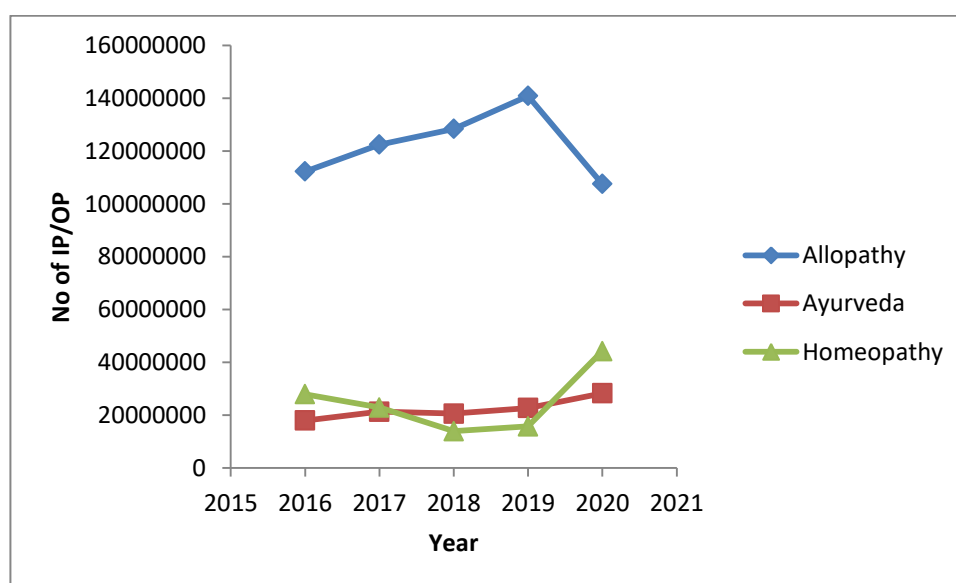
Table 5 Number of hospital beds (from 2016 to 2020)

Year	Allopathy	Ayurveda	Homeopathy
2016	50751	3064	1218
2017	50783	3064	1218
2018	51197	3074	1218
2019	51331	3154	1218
2020	51567	3154	1218

Source: Economic Review of various years

Increased reliance of people on government hospitals is reflected in the increased number of IP/OP patients during this period. As shown in the figure, there has been an increase of nearly 3 crore of patients in Allopathy hospitals from 2016 to 2019 while people have kept away from hospitals in 2020 due to COVID-19. But the dependence on Ayurveda and Homeo institutions has increased in 2020.

Figure: 3 No of Inpatients and Outpatients during 2016-2020



Source: Economic Review of various years

Success stories

Nipah outbreak in 2018 and 2019

Kerala state experienced a first ever outbreak of a novel virus disease, Nipah virus disease, which is considered to be one of the highly fatal emerging zoonotic diseases globally. The outbreak response activities undertaken by Kerala Health system contained the outbreak in the shortest time of 10 days, though we lost very precious 16 lives during the period. All contacts of the confirmed/probable cases including the health care providers of various health facilities were listed out, tracked for their health status daily, samples were tested in probable cases, and continuously monitored till they are out of the maximum incubation period. Thus, about 3500+ contacts, spread over both the affected districts were contacted by our health staff and volunteers. The historic response of our tiny State was subsequently appreciated globally by the World-renowned institutes like Baltimore Institute of Human Virology in July 2018.

Kerala floods

Kerala state experienced another public health challenge, this time in the form of an unusual natural calamity, during the month of July-August 2018, affecting almost all districts of the State. The event started with torrential rain in the Alappuzha district in July third and fourth weeks, followed by northern districts of Wayanad, Malappuram and Kozhikode from 8-8-18, progressed to affect the central and southern parts on subsequent days lasting for about 14 days in its worst form. Actual loss to human life and properties is being assessed, but an approximate estimate is loss of 300+ human life, thousands of animals and property worth about 8500 crores. More than 10,000 kms roads have been damaged extensively. Health care institutions also were affected, and assets lost. Govt of Kerala, responded in a timely and most effective manner in controlling this disaster under the remarkable leadership of Chief Minister, sufficiently supported by Ministers of Health, Revenue, and Local Governments.

Incident command centre and Control Rooms set up in Directorate of Health services and all district headquarters. The control room contact numbers were shared with community also. State and District Disaster Management system were activated from 9.8.18 onwards in northern districts and from 14.8.18 onwards in other districts. State Rapid Response Team convened an emergency meeting to draft guidelines for the control measures. Representative of Regional Director of Health (RDO-Trivandrum) participated and contributed in formulation of the guidelines. At State Control room, separate cells were designated for logistic management, media management, & data management. Available department staff were designated to provide 24 hr service in these control rooms, supplemented by deployment from non-affected regions. These centres monitored the situation twice daily and reported to State and central government. Guidelines for prevention and control of communicable diseases and also for systematic functioning of relief camps were formulated and circulated. A Health inspector/ Multipurpose health worker was entrusted to supervise the health and sanitation part of all relief camps. Local ASHA, AWW and Kudumbasree volunteers and members of WHSNCs instructed to involve in full scale in relief camps. Advisories to Health workers, public and NGOs regarding the preventive health aspects were formulated and circulated in both English and Malayalam languages. Focus given to prevent food borne infection, water borne diseases, Leptospirosis, Snake bites, and any unusual symptoms to be reported immediately to respective PHCs. When the flood water started receding, steps were initiated for safe return of the victims of this disaster-All damaged houses will be restored in a phased manner, temporary shelters will be provided for completely damaged families. Counselling services are arranged for those traumatised in the tragedy. State and District Mental Health teams ensured necessary support to the victims. steps are taken to ensure continuation of treatment of NCD cases. Disease surveillance system was strengthened. Steps are initiated to clean and super chlorinate all drinking water sources and safe disposal of carcasses as per standard guidelines with help from officers of Animal Husbandry department. Steps are also taken to disseminate correct information and status of the flood impact to various media on a regular basis. Social media reports are regularly monitored and steps to regulate misinformation is also taken, to avoid undue panic in the society.

COVID-19 Pandemic

Kerala reported the first case of COVID-19 in the country, less than a month after the disease was first notified by the World Health Organization. Learning from previous experiences managing the two Nipah virus outbreak and recurrent natural disasters, the State responded by activating its public health emergency response system. Kerala quickly established a surveillance system, enhanced its existing infrastructure capacity, and trained its entire workforce to tackle the new challenge. Kerala was the first State in India to start RT-PCR testing in its laboratories. Through a systematic approach of 'Test, 'Trace and 'Treat, the State could prevent the rapid progression of the pandemic and ensured that the health system was never overrun by the sheer number of cases. Kerala is one of the states with the lowest case fatality rates. Kerala is also one of the states which tests the highest number of persons per million population. Even during the lockdown and unlock phases, the govt. took steps to ensure continuum of care to all persons with Non-communicable diseases and other chronic illnesses by providing medicines at home and ensuring access to health care through telemedicine and tele counselling services. Kerala also ensured psychosocial support to all its citizens during the lockdown period and beyond. Elderly and other vulnerable persons were protected by ensuring reverse quarantine. The efforts of Kerala govt. in flattening the curve were widely appreciated by the World Health Organization and many other public health organisations worldwide.

Conclusions

In the NITI Aayogs Performance of States in Health Outcomes Index in June 2019 (Healthy States Progressive India — Report on the Ranks of States and Union Territories), Kerala ranks at the top in terms of overall performance with an overall score of 74.01. However, with respect to annual incremental progress, it ranks at the bottom (16th among 21 larger states). This is because it has already made significant progress in health outcomes, and therefore there are only marginal improvements.

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CHAPTER 2.2

BACKGROUND PAPER ABOUT THE ACHIEVEMENTS OF GENERAL EDUCATION DEPARTMENT OF GOVERNMENT OF KERALA²

Kerala stands well ahead of other states in India with respect to social indicators like literacy and school enrolment, especially the school enrolment of girls, Schedule Caste and Schedule Tribe students. The state Government takes great care in ensuring good quality infrastructure and hygienic environment in schools.

The last 50 years has seen tremendous growth in educational facilities at all levels of education in the state. The General Education department directly manages over 14000 schools, 16000 teachers, and over 20000 non-teaching staff of the state. It administers school education from the pre-primary level to the higher secondary level, as well as teacher- training.

Kerala has achieved a human development index compared to the developed countries of the world.

Historical background

Kerala is the most literate state in India with a 93% literacy rate. Even prior to 1875 the three administrative divisions into which present day Kerala was divided had higher male as well as female literacy rate than the rest of India. In the erstwhile Travancore and Cochin princely states, there was steady increase in female literacy; with growth during 1911 to 1951. In 1890 the all-India male-female literacy ratio stood at 17 to 1, while in Kerala it was only about 5 to 1. By 1951 the male literacy rate was only 1.6 times higher than female literacy. In other words, the difference between male and female rate of literacy was narrower in Kerala than in the rest of the country.

There were several measures taken to promote female literacy such as waiver of school fees for girls in primary schools in Travancore in 1896, and in Cochin in 1901 (Nair, 1981). Around the beginning of the twentieth century, policy measures promoting education of castes considered low in the existing social hierarchy were undertaken by the state. In 1896, Travancore government offered incentives for schools established for the “backward castes” (Gladstone, 1989). In 1906 primary education was made free for students from such castes in Travancore which was followed in Kochi in 1909. In Kochi, the proportion of such students increased from 7 per cent in 1911 to 12 percent in 1920 and to 25 percent in 1926. In Travancore, the number of “backward caste” students increased to 16,000 in 1906 and by 1910 they represented 10 percent of enrolment. While the backward groups still suffered in relation to literacy and education, the provision of free primary education facilitated greater participation from even economically backward groups (Nair, 1981). Table below gives a measure of this progress in terms of the growth of literacy.

² This section is Prepared by Dr. Divya C. Senan, Assistant Professor, Department of Education, University of Kerala

Growth of Literacy in Kerala			
Year	Literacy Rate (Men)	Literacy Rate (Women)	Total
1901	19.15	3.15	11.14
1911	22.25	4.43	13.31
1921	27.88	10.26	19.02
1931	30.89	11.00	21.34
1941	-	-	-
1951	49.79	31.41	40.47
1961	54.97	38.90	46.85
1971	66.62	54.31	60.42
1981	87.74	75.65	80.42
1991	93.62	86.17	89.51

Source: *Economic Review*, Kerala State Planning Board, 1994.

One of the remarkable achievements of education in Kerala is its outstanding successes in achieving universal enrolment of children at the primary level, rapid decline in the number of dropouts at the secondary level, and the availability of educational institutions in the immediate neighbourhood of most households in urban and rural areas. These achievements have received acclaim in India and abroad so much so that parallels have been drawn with the developed countries and with countries like China.

The origin and history of Kerala's development process since ancient times, through the pre-independence period of colonial rule and post-independent rule of democratic governments suggests that several factors underlie Kerala's success in the educational sphere, even when the rest of the country lagged behind. One must, for instance, mention the role played by extensive missionary activities and by the governments of the erstwhile princely states of Travancore and Cochin in the late nineteenth century, and the impact of diverse social reform movements in the early part of the twentieth century. The contribution of the socio-religious reform movements in the beginning of the 20th century, the role of missionaries, and the progressive policies of democratic governments have built the foundations of the state's education, health and social services infrastructure.

The linguistic homogeneity of the state was a great facilitator of the spread of school education as 98 percent of Keralites are native speakers of Malayalam, thereby making the spread of literacy easier and communication smoother. The activities of the Christian missionaries decisively influenced the expansion and development of health and educational facilities in Kerala—especially in central Travancore—by opening their doors to the underprivileged and the so-called untouchables. These led to a mushrooming of schools and colleges across the state. The incentives provided by the job opportunities that opened inside Kerala as well as by the movement of labour from Kerala to other parts of India and to other countries, constituted another important factor. The rise of democratic forces in Kerala in the middle decades of the century contributed equally to the acceleration of educational progress.

In 1817 Rani of Travancore declared the Royal Descript accepting the responsibility of the government in assisting village schools (Tharakan, 1984, 1986). The participation of non-governmental agencies was facilitated by early introduction of grants-in-aid. Protestant

Missionaries who were the first to introduce ‘modern’ education benefited from governmental grants in starting schools as also indigenous Christian agencies subsequently (Mathew, 1987).

In the wake of the Educational Rules in Grant-in-Aid Code of 1894-95, the government of Travancore established 15 schools for educationally and socially backward castes and communities like Muslims, Ezhavas, Pulayas, Marakkans and Kanis. It was followed in a year by another 15 such schools being opened. Several other incentives were provided for preparing teachers for these schools, in addition to fee exemption and special assistances for starting them. The Christian missionaries once again made the most of such opportunities (Mathew, 1987).

By 1901, Travancore had over a thousand schools under the education department, roughly half run by the state and the rest by private management. The schools together enrolled 96,700 pupils (Jeffrey, 2005).

Schools were categorized by three funding models – government, aided and private (unaided). The initiative of imparting education in the indigenous language by missionaries and princely states of Travancore and Cochin led to a rapid expansion of reading and writing in Malayalam.

The influence of socio-political movements was mainly responsible for the rapid spread of liberal and radical ideas among different sections of the people, which in turn created an across-the-board demand for education irrespective of the divides of class and community. The most revealing indicator of this trend was the rise in women’s literacy, which increased threefold during 1931-51 and has not looked back ever since (Krishnakumar, 2001). The general trends in education during this period are shown below.

Growth of Institutions and Enrolment in Travancore (1884-1947)					
Year	Institution		Enrolment (in thousands)		Expenditure of the Government (Rs. thousands)
	Government	Private aided	Government Institutions	Private aided Institutions	
1884 - 85	228	514	13.4	18.4	218
1902 - 03	434	1013	49.4	56.6	641 (1904-05)
1909 - 10	519	805	79.8	56.5	760
1919 - 20	1116	1642	291.0	153.2	2853
1924 - 25	NA	2108	241.8	382.5	3713
1945 - 46	1192	-	393.5	431.5	6316
1946 - 47	1723	2152	555.0	420.6	7853

Source: P.R. Gopinathan Nair: *Education and Economic Change in Kerala*, Centre for Development Studies, Trivandrum, 1978.

In Kochi, the government established 33 vernacular schools in 1818 (Menon, 1995). The Education Code introduced in 1911 abolished fees at primary level and introduced scholarship to poor students (Menon, (ed),1932). In 1921, a Code Revision Committee recommended exemption of fees to the children of depressed classes and half fee concession to Muslims, Ezhavas and other backward classes in English schools, and recasting of scholarship rules by enlarging its scope to include girls, Muslims and other “backward and depressed classes”. This historic evolution in education had achieved substantial gender equity in enrolment in the state.

Gradually, nearly half of the students in lower primary classes became girls. There seemed not much gender disparity in the pre-primary school enrolment either. The proportion of girls was higher in higher classes in schools.

The Education Scenario Today

As per the ‘complete literacy’ norms of National Literacy Mission (NLM) and UNESCO, Kerala became a fully literate state on April 18th, 1991. It had a literacy rate of 91 (against India’s 66). The literacy rate of the state was comparable to the most advanced regions of the world.

The most significant marker of the success of Kerala’s education policy lies in the migration of students from the private and aided school sectors to the government sector schools.

The table shows the new students who sought admission in public funded schools in Kerala, from 2016-17 to 2019-20.

Table *New students who sought admission in public funded schools in Kerala, from 2016-17 to 2019-20*

Management	Standards								Total I to X
	I	II	III	IV	Total (I-IV)	(I-V-VII	V-VII	VIII-X	I-X
From 2016-17 to 2017-18									
Government	5703	3629	3615	2641	15588		5475	38789	59852
Government-aided	6495	6474	6296	5934	25199		58670	12844	96713
Grand Total	12198	10103	9911	8575	40787		64145	51633	156565
From 2017-18 to 2018-19									
Government	5784	5815	5603	5729	22931		12229	35484	70644
Aided	4294	8623	8546	7723	29186		67483	18658	115327
Grand Total	10078	14438	14149	13452	52117		79712	54142	185971
From 2018-19 to 2019-20									

Government	-168	5578	5483	5330	16223	12616	36376	65215
Aided	-3222	7626	7742	7266	19412	63312	15619	98343
Grand Total	-3390	13204	13225	12596	35635	75928	51995	163558

Source: Directorate of General Education, 2019

Improvement in School Infrastructure

A major reason for the attraction of the government school sector for private school students lies in the improvements made in the last four years in school infrastructure. Here, 141 schools have been raised as centres of excellence. Special financial support is provided to the 150-year-old heritage schools. Financial support is also given to 106 higher secondary, 27 VHSE and 181 LP/UP schools in order to improve their infrastructure facilities. Further, 141 RMSA schools were upgraded as Government Schools, thereby creating additional posts to settle the scarcity of the teaching and non-teaching staff. The construction of the buildings of 52 RMSA schools have been completed.

Department of General Education

The Department of General Education is the Government of Kerala's body for school education. It was formed in 1995. The department administers school education from pre-primary level to the higher secondary level and teacher training.

SCERT

The State Council of Educational Research and Training (SCERT Kerala), is an autonomous body of the Department of General Education, established in 1994 as a result of transformation and upgradation of the former State Institute of Education (SIE). It is the apex body in academic matters of school education from pre-primary to higher secondary level. The multifarious functions of the institution ranges from policy formulation, curriculum development, preparation of teaching-learning materials, educational researches, vocationalisation of education etc. to teacher education programmes in the state.

IT@ School/ KITE

In 2001, the Department of General Education, Government of Kerala started a project named IT@School with a vision to improve the effectiveness of the entire department through proper e-governance mechanism, to train teachers in latest ICT innovations, to create a IT literate community, to improve the quality of education via latest ICT technology and finally to improve the quality of education via ICT technology.

Later in August 2017, IT@School was transformed in to Kerala Infrastructure and Technology for Education (KITE).

Table *The Project through the years*

2000	A task force was formulated headed by Prof. U. R. Rao & the Vision Document was submitted.
2001	IT@School Project was established and IT campaigns were conducted state wide
2002	Network of Master trainers and School IT Co-ordinators were formed and Teacher empowerment programmes started
2003	IT became a Compulsory subject in State Curriculum, IT practical exams undertaken.
2004	District Resource Centres of the Project were setup and IT enabled contents developed.
2005	IT@School Linux was developed so was the launch of EDUSAT ViCTERS network
2006	Complete shift to Free Software, Handbooks and supplements developed
	IT practical exam were conducted entirely on FOSS.
2008	<p>Broadband connectivity was provided to all schools in the state</p> <p>Piloting of ICT enabled education from IT education commenced</p> <p>Laptops were issued to all schools in the state</p> <p>IT@School was selected as the nodal agency for all e-governance initiatives within Department of General Education.</p> <p>IT@School Project enabled a complete FOSS implementation within the Education department</p>
2009	<p>The shift to ICT enabled education was at pace</p> <p>ViCTERS educational channel was made available in all local cable networks</p> <p>Electrification of classrooms was initiated by the Project</p> <p>IT@School Project was expanded to Upper Primary and Higher Secondary sections</p>
2010	<p>Complete implementation of ICT enabled education in the state commences.</p> <p>School Wiki was launched by the Project</p>

	Model ICT schools with Smart Classrooms are being implemented state wide. Training for over 28,000 Student School IT Co-ordinators was undertaken
2011	HarithaVidhayalam Educational Reality Show- first of its kind in the country
2012	IT theory exam in High schools also integrated into software. SSLC Exam and Career specific content developed for VICTERS
2013	Hardware Training for Vocational Higher Secondary students
2014	Multimedia rooms and Smart boards to 748 schools and Upgradation of VICTERS channel from Analogue to Digital transmission
2015	VPNoBB connection provided to 1390 schools
2016	Pilot implementation of Hi-Tech school programme in the State. Broadband connectivity to all LP and UP school SchoolWiki re-launched Massive training for Student School IT Co-ordinators

Since 2003, Information Technology has become a compulsory subject in the state school curriculum. As part of in-house content creation, the project worked with SCERT to create textbooks and CDs. In September 2004, India launched a satellite called EDUSAT to improve education in the country. Kerala is the first state in India to utilize EDUSAT. The IT@School project uses the EDUSAT network, to broadcast an educational channel called Virtual Classroom Technologies for Rural Schools (ViCTERS). ViCTERS is India's first broadband network on EDUSAT and Kerala has become the model state in India to implement ViCTERS (Das, 2010; IT@School, 2013). IT@School is one of the biggest deployments of FOSS-enabled instruction in the world. The project has been utilizing the FOSS (Free and Open Source Software) Linux based OS 'UBUNTU' since 2005 to avoid any kind of license restrictions, which has also been used to develop the data resource centers and IT based content. IT@School provided ICT infrastructure to 4071 schools during 2007-2012. The ICT enabled education started as a state-wide implementation project in 2010. r. By 2013 the project started with providing hardware training to the Vocational Higher Secondary Education institutes to build a robust system for supporting the state wide ICT enabled education. The ViCTERS channel had an essential landmark in 2014 when it was completely turned digital and the channel had its own broadcasting station. A separate team of production takes care of the writing, production and after production of the content broadcasted on the channel daily for 17 hours from 6 AM to 11 PM, whilst the students and teachers are involved in the process of producing various shows as well.

The next major step in the direction of ICT enabled education was installing of broadband in around 1400 schools in 2015. This laid the path for using this infrastructure to enable digital online resources in the classroom teaching. The pilot phase of Hi-Tech School Project in 2016

carried this forward by installing broadband in Lower Primary and Upper Primary schools across state and testing out the initial form of platforms like samagra and sampoorna. These initiatives were implemented on a larger scale by 2018, while new initiatives to involve children and parents like Little Kites and Sametham were introduced as well (Gaur, Ashish, 2020).

Kerala is now the first state in the country to achieve total digital education by bringing primary schools too in the ambit by 2019-20. The hi-tech school project aimed at imparting Information and Communication Technology (ICT) enabled education from classes eight to 12. Kerala Infrastructure and Technology for Education (KITE) has implemented the prestigious project in 45000 classrooms in 4752 government and aided high schools, higher secondary schools as well as vocational higher secondary schools in the state

The high-tech school project aims to ensure IT-enabled education facilities for children in classes VIII to XII. As part of this project, the government supplied 59772 laptops, 43525 multimedia projects, 41789 mounting kits, 41878 HDMI cable, 40616 face plate, 23104 screens, 42739 USB speakers, 4714 DSLR cameras, 4545 LED 42' televisions and 4720 full HD web cams. The beneficiaries were 4752 Government schools in the High School, Higher Secondary and Vocational Higher Secondary streams. Broadband connectivity has been provided to 13980 government and aided schools, including 9941 primary and upper primary schools.

School Wiki is an online resource bank which aims to foster a culture of collaborative learning among students by building an encyclopaedia about all schools in Kerala. School Wiki currently features details of over 15,000 schools in Kerala and provides a macro view on the schools' elementary data, historical references, infrastructure, renowned Alumni, School websites, School Map, Blogs, Class Magazines, supporting images and videos. It already has over 30,997 articles in Malayalam, which are accessed by 13,000 users as it increases each day.

'Samagra' e-Resource Portal, a platform to enhance leaning and communication in Hi-Tech classrooms, has been developed. Digital resources for classes 1 to 12, numbering 31031, have been made available in the Samagra resource portal: the resources include 5482 videos, 8271 images, 6476 interactives, 10026 other files and 776 audios. Samagra portal also contains 5.5 lakhs of micro/unit plans and 8.89 lakhs macro plans prepared by teachers.

Sametham is an initiative which aims at achieving better transparency about the data related to public schools by making it accessible to the people in an easy manner. Its aim is to share the authentic data of academic and infrastructural details of the public, aided and recognized unaided schools in Kerala with the public. Sametham opens the doors to view the basic details of schools including its physical infrastructure, governing mechanisms etc so as the schools and community can come closer to work in tandem with each other.

The largest Student IT Network in the Country, 'Little KITEs' IT Clubs, has been established in 2060 schools, with 1,15,344 students as its members. The project, Little KITEs IT Clubs, is an initiative by KITE to instil genuine interest and creativity among students, by providing training in animation, cyber safety, Malayalam computing, electronic hardware, Internet of Things (IoT) devices, and 3D character modelling. With approximately 1.25 lakh student members in over

2060 schools, Little KITEs is the largest ICT network of students in the country. Over 50,000 students have been trained in specific areas as part of this initiative. In August 2019, KITE conducted a two-day residential State-level Camp for 1143 Little KITEs, who were champions in the sub-district wise camps where as many as 13440 student members competed. Through Little KITEs, students are trained in Internet of Things (IoT) devices, Blender (FOSS based 3D computer graphics software), Character Rigging (creating 3D models of, for instance, dining table, glass and fruit basket), and 3D animation (solar system, flight of birds). Students themselves designed the characters and created animation for them. They were also given training in Mobile App development (torch app, QR Code scanner), electronic voting machines using Raspberry Pi electro brike, IoT device model which enabled operating lights and fans in a network using sound signals and text messages, development of light applications using App Inventor and PyQt servers for creating server, client programmes required for this purpose etc. As part of the Little KITES, Digital Magazines of over 2000 schools have been made available online, which can be viewed from the 'Digital Magazine' link in School Wiki portal.

KITE's Open Online course (KOOL), an online training programme, has been set up to provide training to teachers, without interrupting that regular working hours in schools. 'Sametham' portal provides basic information regarding the schools of the State, including their physical infrastructure and governance mechanisms, approved classes, details of student in each class, and details of teachers and non-teaching staff, to the general public.

Sampoorna is a School Management Software which was initially launched in 2010 as a part of its e-Governance initiatives. The platform has now been made mandatory by the State Government to capture and manage the database of the students of all grades. The application is based upon a FOSS platform as and aims to serve as the single platform for details of students such as transfer certificates, reports, entry forms, etc. It also plans to include other detailed information on school facilities soon, such as infrastructure, equipments, furniture, sanitation facilities etc. It also plans to be used to include information about students such as the attendance detail, their learning progress and evaluation of their learning-based activities which the teachers and parents can access at ease.

Another highlight is the Textbook Intending system, which is a web application used for collecting the textbook requirements from the schools. The application which is called "TEXTBOOK SUPPLY MONITORING SYSTEM", helps schools to submit their total print order requirement to the Text Book Officer, who then forwards the details to KBPS (Kerala Books and Publications Society). The books would be supplied through the societies in each school. Thus, one of the focus areas of this system is to ensure better tracking and more effective monitoring of the distribution of books in the public schools of Kerala.

State Institute of Educational Technology (SIET) has been organizing the Kerala State Children's Educational Film Festival every year since 2008 to promote excellence in Educational video programmes and to create awareness among students who are interested in the field of film production.

Another highlight is the ‘Vayana Vasantham’ portal. School library renovation and classroom library launch were conducted through this portal. It is the nodal agency of the General Education Department’s ‘Sasthrarangam’ project.

Another project, ‘Sasthrajalakam’, provides opportunities to students to conduct experiments in institutions of higher education and take part in interactions. Nearly 2,100 students took part in residential workshops conducted as part of the programme in 42 colleges and universities. It is a three-day residential programme organized by colleges and universities for selected students from 9th grade. The students are given training based on innovative Science curriculum and are provided lectures by eminent experts from ISRO, IISER etc. It was implemented in 42 centres all over Kerala. Schools students were given practical experience in artificial intelligence, nanotechnology, and bioinformatics with the support of various universities and institutes. Students got to interact with Nobel Prize winner Richard Roberts, scientists Viktor Kozlov and Suresh Pillai, and academic Achuthsankar S. Nair.

To bring visually-challenged students to the main stream, learning materials in audio form was introduced with the help of Prasara Bharathi. The programme ‘Kettu Kettu Padikaam’ was initially broadcasted through All India radio and intend to distribute the CD of this audio clips to the students free of cost.

In a first in the country, the State Institute of Educational Technology (SIET), an autonomous institution under the General Education Department, has made digital contents in tribal languages named ‘Gothramozhi’ so as to make tribal children learn their own languages in a much easier way. SIET has made the digital contents in Adiya, Paniya, Oorali and Kattunaikkar tribal languages for Class I.

IT@School Project Approaches and Strategies

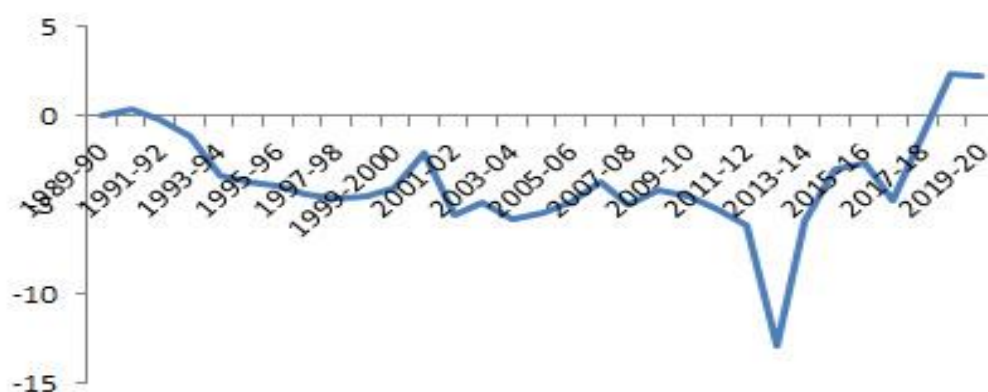
The Project has been divided into three phases: IT-education, ICT-enabled education and ICT-embedded education. IT-education focuses on teaching students the basic aspects of hardware, software and programming. In the ICT-enabled education, the learner enhances learning on different subjects with the support of technology. The ICT embedded education focuses on designing courses with ICT and making ICT an integral part of the learning environment. As part of the implementation strategy, the project established offices in each district and appointed district coordinators in each district. Then the project recruited 200 high school teachers as master trainers who work closely with district coordinators to train the teachers in their school districts. At the school level, 5600 high school teachers were selected as School Information Technology Coordinators (SITC), who are responsible for implementing the ICT activities. To support SITC in ICT-enabled education, each school has ten students selected as Student School IT Coordinators (SSITC) with a total of 28,000 in the state. These student coordinators help other students—and sometimes-even teachers—to resolve technical difficulties in the class.

Pothuvidyabhyasa Samrakshana Yajnam

General Education Protection Mission (Pothuvidyabhyasa Samrakshana Yajnam) project aims to make Kerala a fully digitalised state in education sector. The state government would facilitate necessary physical, academic and digital contents which are required for implementing this programme. This programme is closely monitored and evaluated by the Panchayat-Constituency-District-State level mission teams. The main objective of the 'Public Education Protection Mission' launched by the Government has been to raise the quality of teaching and learning in schools in the State. The focus has been on the development of school infrastructure as well as enrichment of academic and social aspects of school education. The mission has managed to bring together a wide range of persons, including teachers, parents, alumni, and people's representatives, towards the goal of creating high quality public educational institutions across the State.

The programme to revive public education in Kerala has led to a huge improvement in enrolment in government and government-aided schools in Kerala. Around 1,56,565 new students sought admission in government and government-aided schools in Kerala during the academic year 2017-18. The corresponding numbers were 1,85,971 for the year 2018-19 and 1,63,558 for the year 2019-20 (Table 2.1.2). Such a phenomenon has occurred for the first time in the field of general education in Kerala after the academic year 1991-92.

Figure : Trend of schools enrolment since 1989-90



Source: Director of General Education, 2019

Highlights of Kerala's Recent Achievements in Education

The total number of students enrolled in schools in Kerala from Standards 1 to 10 was 37.2 lakh in 2019-20. Of these, 31.4 per cent or 11.7 lakh students were enrolled in government schools, 58.1 per cent or 21.6 lakh students in aided schools, and the remaining 10.5 per cent or 3.9 lakh students in unaided schools. Between 2016-17 and 2019-20, the proportion of students enrolled in government schools increased by one percentage point, from 30.4 per cent to 31.4 per cent.

In 2018-19, there were 3.2 lakh students enrolled for higher education programmes (both graduate and postgraduate programmes) in colleges of Kerala in the Arts, Science and Commerce streams. Out of these, 68 per cent or 2.2 lakh students were females. Also, 15 per

cent of these students (numbering 48,503) belonged to the Scheduled Castes and Tribes (Scheduled Castes and Tribes, together, accounted for 10.94 per cent of Kerala's population in 2011). Of the students who were enrolled in government and aided colleges in Kerala in 2018-19 for engineering graduate degrees, 41.3 per cent were women. Among students who were enrolled for engineering postgraduate degrees in such colleges, 64.9 per cent were women.

Since Kerala has already achieved universal literacy, recently Kerala State Literacy Mission Authority (KSLMA) has entered into new avenues with focussed and specialised literacy programmes viz., environmental literacy, literacy of SC/ST, literacy programmes for migrant workers, literacy for transgender etc, which are more relevant in the context of Kerala.

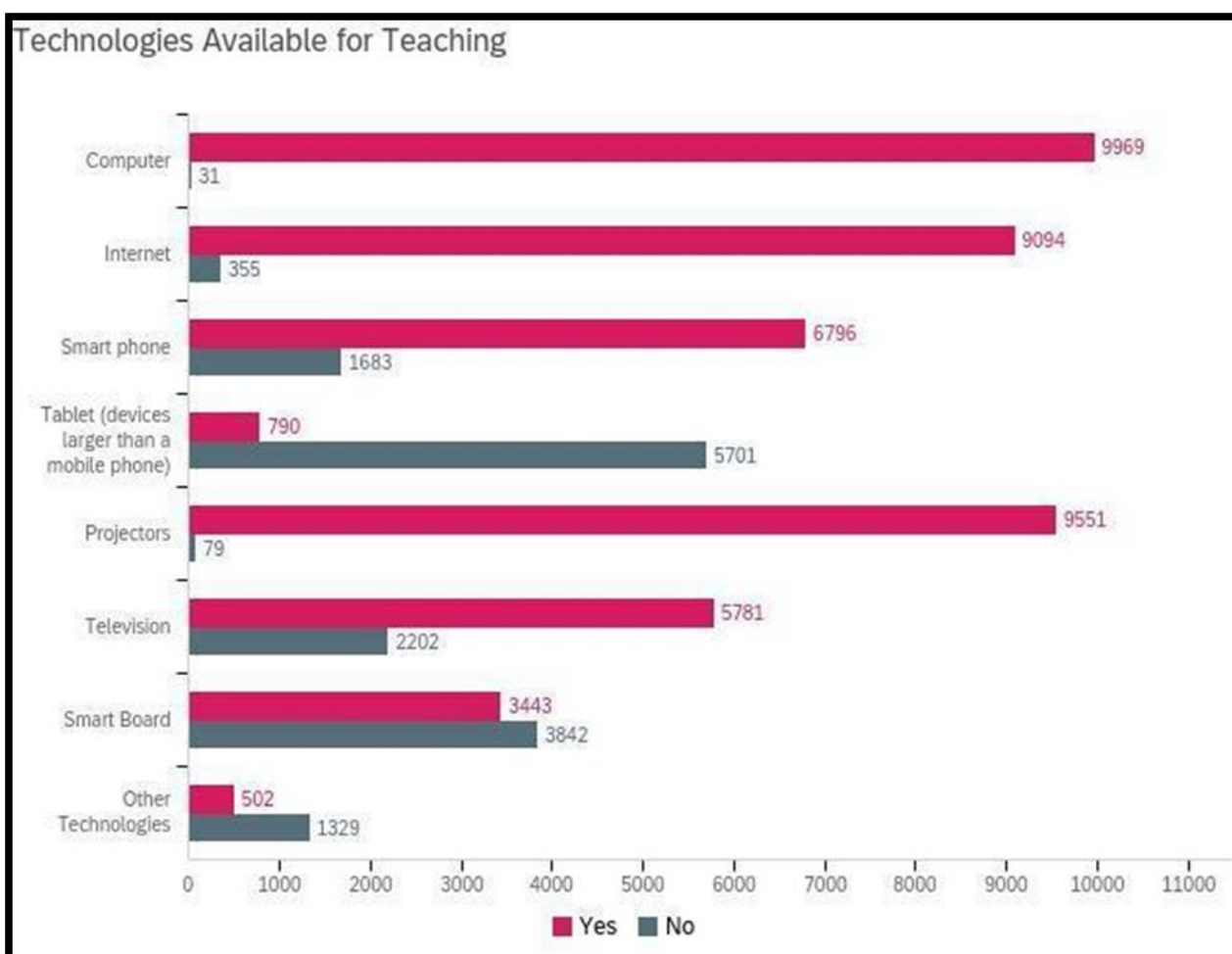
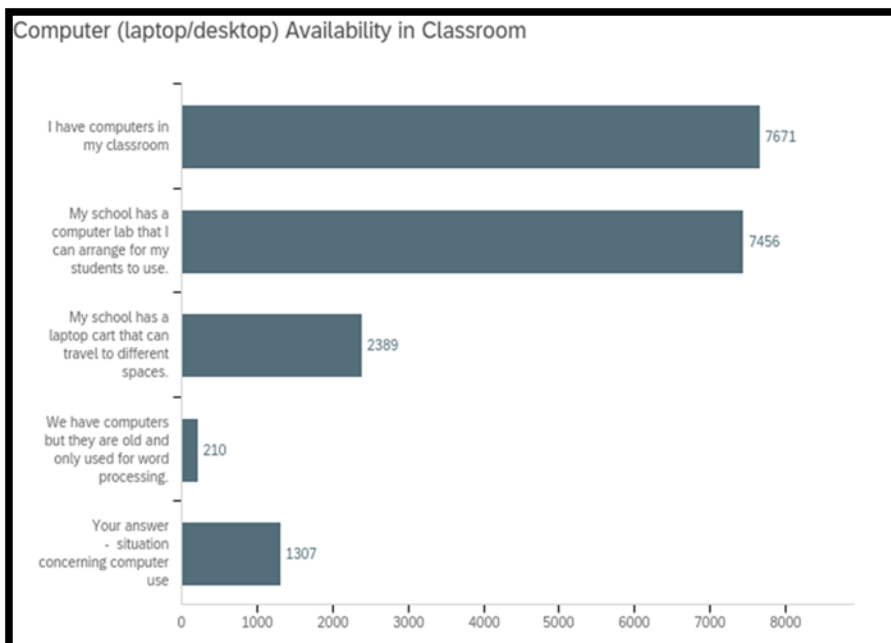
Various programmes like 'Aksharalaksham' to wipe out illiteracy, 'Aksharasagaram' for the coastal regions, 'Samagra' for the SC category, 'Navachetana' for ST category, 'changathi' for migrant labourers from other states, 'Samanwaya' for transgenders have been implemented. Environmental, constitutional and renaissance values related to democratic educational programmes are being organised as a part of Social literacy programmes.

In order to give awareness on bio-diversity, agriculture and the environmental issues, Bio-diversity parks have been set up to materialise the concept of 'Campus a text book'. Bio diversity parks started functioning in 12,000 schools in the State.

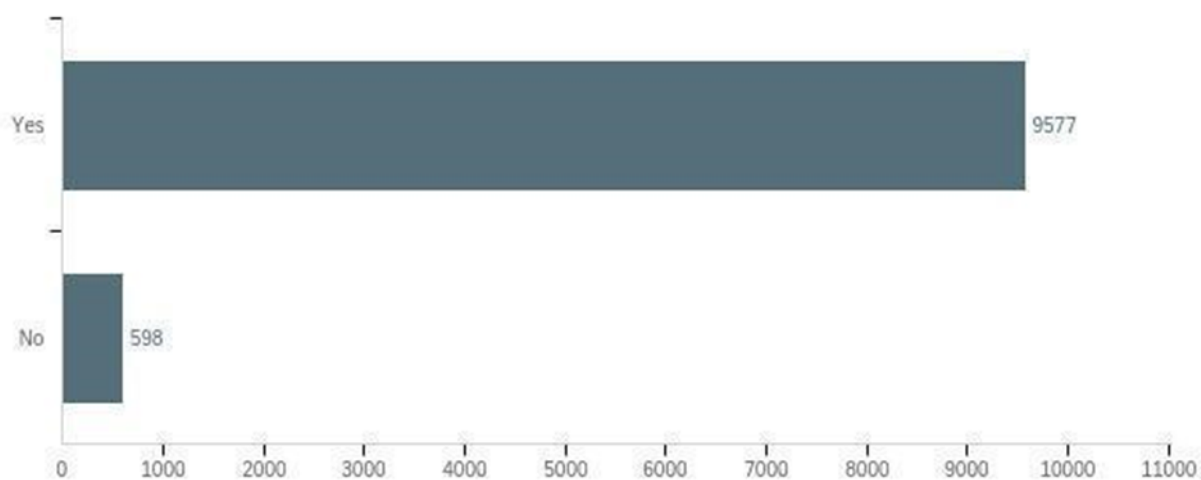
'SITAR' an innovative programme is also developed for the students who excel in a particular area of interest and thereby providing them chance to receive learning experience in many of the professional educational centres in and across the state and country. (Source: Kerala State Planning Board)

Sradha, a programme by government to support the students from Class 3 to Class 8, who require additional academic support, has been initiated. 2,60,877 students benefitted out of this scheme last year. As part of sraddha, a special focus on mathematics has been envisaged by providing 'operational mathematical skills' to the students who have not attained minimum essentials in mathematics.

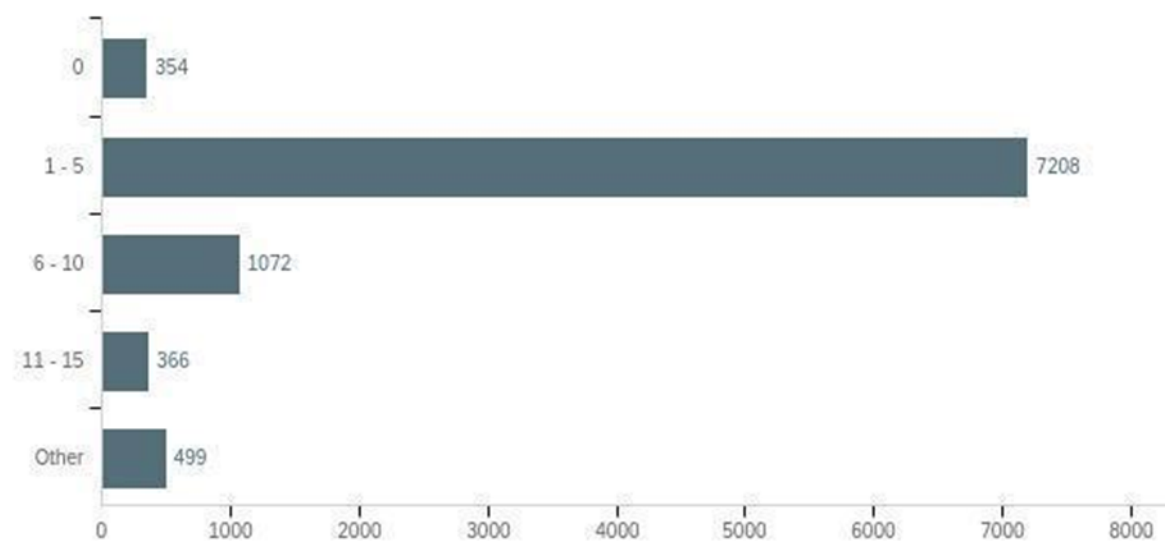
Widespread implementation of the Information and Communication Technologies and in all fields of education have enabled the convergence of a wide array of technology- based and technology-mediated resources for teaching and learning. Moreover, it attracted a large group of students to the learning fraternity. It has therefore become possible to employ ICT and other innovative initiatives as an omnibus support system for education. A collaborative study entitled 'Report on Kerala Government's Hi Tech School Programme Implementation' by Ohio University, USA and University of Kerala, India (Thankachan, Briju; Senan, Divya & Rosen, Mathew 2020) reveals the following conclusions that are given graphically. The overall response from survey, interview, and observation of the mixed methodology study implemented among the high school and higher secondary teachers of Kerala showed that Kerala teachers and students alike have benefitted immensely from the recent changes and state-wide initiatives such as KITE that have brought ICT to their schools

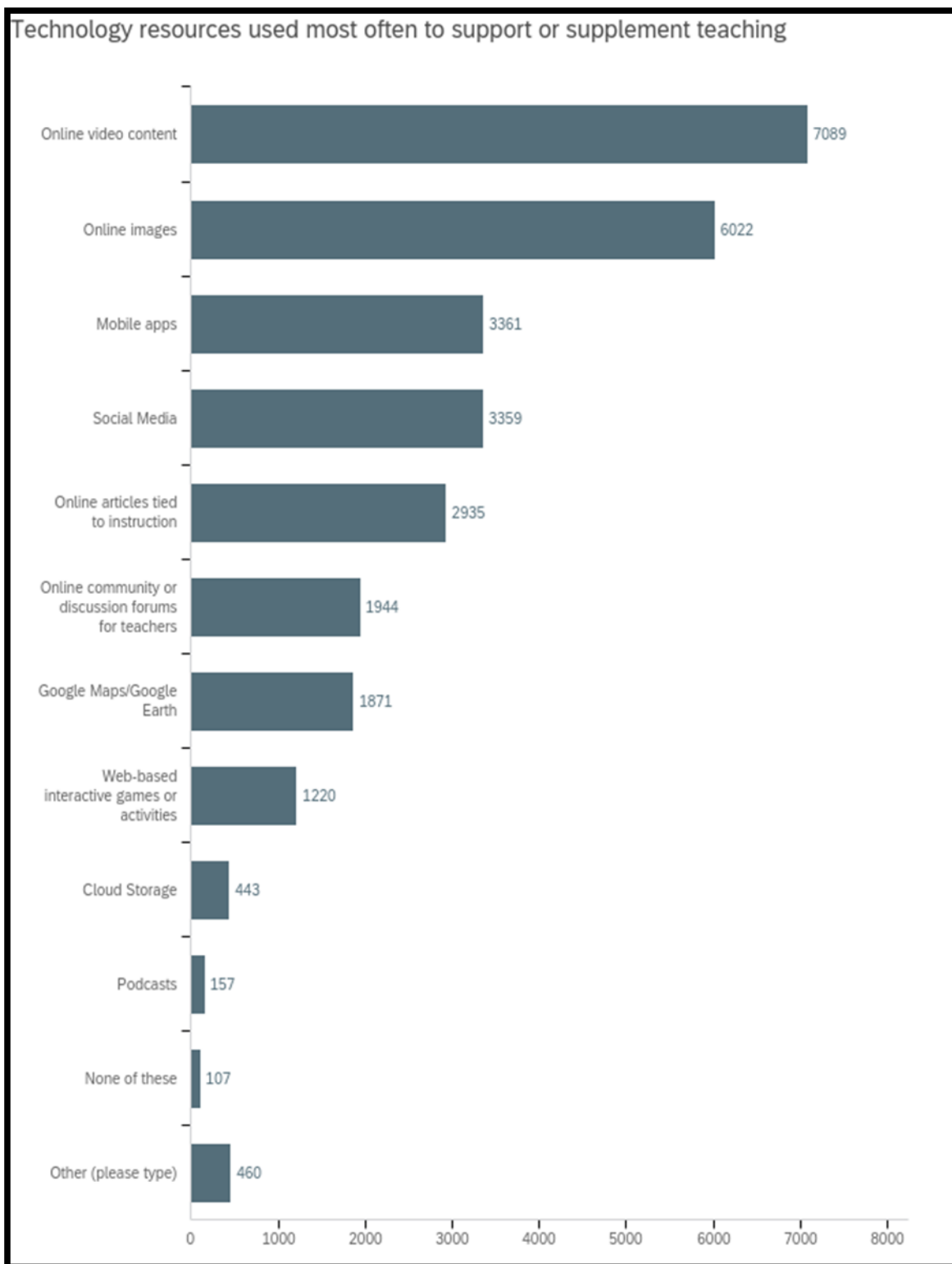


Training received to use ICT to support teaching and learning.



Number of training participated in ICT during past academic year





During the COVID lockdown and after, to ensure that students remain engaged with their syllabus amid the lockdown, the General Education Department has initiated an online career guidance programme. Class X and Class XII students are set to benefit from the programme streamlined to enable them to pick courses in line with their skills. The Career Guidance Adolescent Counselling Cell functioning under the higher secondary section was entrusted with the task. Training was carried out using platforms like WhatsApp video calls and live video

streaming on smartphones, with trainers clearing students' doubts through two-way communication. For Class X students, the department has also arranged an online aptitude test called K-DAT (Kerala Differential Aptitude Test) to help students select courses suiting their aptitude.

The General Education Department implemented several programmes named 'Avadhikaala Santhoshangal' during the lockdown to let the students engage in many hands-on experiential learning projects.

The Department of Education, Kerala, announced the 'First Bell' scheme on May 29, 2020. It starts telecasting virtual classes from June 1, via KITE (Kerala Infrastructure and Technology for Education) Vickers (Versatile ICT Enabled Resource for Students) the educational channel of the state government of Kerala. SCERT monitored the implementation, with the technical coordination of KITE. The sessions are scheduled from 9 .30 am to 5.30 pm, Monday to Friday for all classes from 1 to 10 and 12th, through ViCTERS channel. The duration of the classes varies from thirty minutes to two hours and the classes are available simultaneously on Vickers channel and website, mobile app and social media pages for free. It is a temporary arrangement during the pandemic situation and was not treated as an alternative for classroom education. The government also set up "Ayalpakka Padhanakendrangaal" ('neighbourhood study centres'). The KSFE Vidyashree scheme has been announced to provide laptops to the students at subsidised rates.

CHAPTER 2.3

PROTECTION OF LABOUR RIGHTS

Kerala has a long tradition of protection of labour rights and union activity. Historically, the ground for this was laid by a) the social reform movements of the second half of the 19th century that aimed to abolish caste hierarchies in work and at work places, b) the advances made in education and health, and c) the early progressive welfare measures implemented by the rulers of native states, particularly of Travancore. These factors worked together to establish the basis for a relatively progressive social consciousness in Kerala from the late 19th century onwards.

With the emergence of agricultural workers' movements against the feudal landed class in Kerala, several unions were established. These included the Travancore Labour Association in Alappuzha started in 1922 and the Quilon Labour Union that in 1936 became the Quilon Factory Workers Union. Its members worked in the cashew industry, in cotton mills, saw mills, tile factories and engineering works. They together campaigned for legislative measures for the protection of labour rights. The initial struggles were aimed at the right to form unions, the implementation of fair wages and good working conditions. These movements were broad-based and attracted the working class in large numbers. Following the central government's enactment of the Minimum Wages Act in 1948, and as a result of struggles by cashew workers, the first Minimum Wages Committee was formed in 1952 by the then Government of Travancore-Cochin, which later became part of the expanded state of Kerala in 1956 (Parpola and Kannan, 2017).

Trade union movements became part of the early political process in Kerala: indeed, the political leadership that arose in the state essentially emerged from the trade union movements. The first state government of Kerala introduced the land reform movement in Kerala, which aimed at land redistribution from the landed to the landless agricultural workers in Kerala. The right of ownership over cultivated land was conferred to tenants through the Kerala Land Reforms (Amendment) Act 1969.

Such movements in Kerala had developed over the years a fairly competent mechanism to protect labour rights within the state. The right to work freely, without being attached or bonded, and without being discriminated on the basis of identity had come to existence globally. In India, various labour laws in the country were in place, some of them predating the adoption of the Constitution of the country, some of them appearing during the immediate period following Independence.

The stake-holders in protecting labour rights consist of the workers, the employers and the government. The need for different rights is represented by labour representatives, usually trade unions. The legislative body enacts laws and the executive arm implements. In Kerala, the active role of trade unions and political leadership ensured that legitimate claims to rights were enacted as laws and policies of the state. The Labour Department, established in 1946, is the government body that is entrusted with ensuring smooth industrial relations.

Labour department conduct inspections of establishments under various Labour laws. Labour department conducts various inspections under Inter State Migrant Workmen (RE&CS) Act-1979, Building and other Construction Workers (RE&CS) Act-1996, Kerala Shops & Commercial Establishment Act-1960, Maternity Benefit Act-1961, Payment of Bonus Act-1965 and Payment of Wages Act-1936.

For providing workers with paid weekly leave, overtime pay, minimum wages, seating facility and other benefits, special drives are being conducted at the state level, and squad inspections at the district level. The Enforcement wing of the Department of Labour is working to maintain a work-friendly environment and ensure that workers receive the benefits they are legally entitled to. In addition, the Wage Protection System has been implemented to ensure minimum wages for workers in the unorganized sector and to ensure transparency in the distribution of wages. The Wage Protection System (WPS)/E-Payment is a flagship program of Labour Department of Kerala, introduced in 2015, which aims at ensuring disbursement of wages to through banks, and monitoring of such disbursements to ensure the payment of minimum wages and above.

Labour Department is instrumental in maintaining cordial industrial relations. The industrial disputes are settled mainly through the intervention of the conciliation officers through the process of conciliation. If conciliation fails, the dispute is referred to adjudication by Labour Courts/ Industrial Tribunals. Besides DLO is the conciliation officer of the Kerala Head Load Workers Act, 1978 with powers to settle/decide disputes.

The Government of Kerala, under the chairmanship of Labour commissioner, for maintaining industrial peace and harmony, constitutes the Industrial Relations committees. The members of the IRC are persons having thorough knowledge about the issues experienced by the employers and workmen. Equal number of representatives from employers and trade union are included in the IRC. The Industrial Relations committees through discussions arrive at decisions on wage revision, bonus, service conditions of the workers of the respective industry etc. Though the decisions / settlements of IRC are not enforceable by law, the settlement / decision taken by the committee are considered as a general agreement in the State as a whole. At present 11 Industrial Relations committees are functioning for different sectors, like the Motor Transport industry, the Cashew, Toddy and Coir industries, Private hospitals, the Textile and Plantation Labour industries and the newspaper industry among others.

The Industrial Relations Committees have intervened in disputes arising on bonus fixation in the Coir, Cashew & Textile sectors. Major salary fixation issues that have arisen on the plantation sector have also been settled with the intervention from IRCs.

The present government has introduced the following labour legislations during its tenure.

- Minimum Wages Act Amendment

Appointed Deputy Labour Commissioner as Claim authority & increased penalty on violations under act.

- Kerala Shops & Commercial Establishment Act amendment: Introduced provisions for ensuring the below.
Sitting facilities to the employees.
Consent from women employees on working in between 9 pm & 6 am.
Constituting internal compliance committee for female employees.
Increased penalties on violations of Act.
Introduced provision for mandating eight hours working time for sales promotion employees.
Introduced auto renewal facility which ensures the applicant could automatically download their renewal approvals by online on payment of prescribed fees.
- Maternity Benefit Act Amendment:
 - Introduced maternity leave from 12 weeks to 26 weeks & mandated to employees on both public & private sector.
 - Industrial Dispute Act 1947 Amendment
Sales promotion employees have been updated under the Act.
 - Contract Labour Rules Amendment & Inter State Migrant Workmen Rules Amendment
Introduced auto-renewal facility under the Act
 - The Kerala Investment Promotion and Facilitation Act, 2018-Granting Approvals
Introduced provision on mandating the registration and license should be granted on the same day which application was made
 - Contract Labour Act, Inter State Migrant Workmen Act, Kerala Shops & Commercial establishment Act & Motor Transport Worker's Act.
 - Payment of Wages Act Amendment
 - Appointed Industrial Tribunals as Claim authority.

Support to workers during the COVID-19 lockdown

Labour Welfare Boards announced ex-gratia financial assistance to workers during the lockdown. Apart from direct financial assistance, some of the Boards have also offered interest-free loans.

The bonus was paid to all the members who were members of the Head Load Workers Welfare Board before 14th April, 2020. An amount of Rs.30 crore was spent for 2,43,504 members.

The Construction Welfare Board gave Rs.1000/- to all the members who had completed two years and renewed their membership in 2018. There were about 15 lakh such members and an amount of Rs. 200 crore was spent. The Motor Workers Welfare Fund Board provided financial assistance.

The Abkari Workers Welfare Board disbursed up to Rs. 5000 to bar workers as assistance, and up to Rs.10,000 as an interest free loan. An amount of Rs.1000 was distributed to all members working in hospitals, petrol pumps and gas agencies, and to self-employed persons by Kerala Shops and Commercial Establishments Labour Welfare Board. An amount of Rs. 10,000 was distributed for Covid-affected members, and Rs.5000 for members in isolation.

Kerala Agricultural Workers Welfare Fund Board distributed an amount of Rs. 7500 to its registered members who tested Covid positive, and Rs.1000 was given to members who were in isolation because of Covid-19.

Covid-19 Pandemic and Interventions for Guest Workers

The number of guest workers who lost their jobs and income was 4,34,280 as estimated by the Department of Labour. They were sheltered in 21,556 camps all over the state. Food, water and recreational facilities, like television and indoor games were provided to them in the camps. As a result of such pro-active interventions from the Labour Department, no guest worker was deprived of food, drinking water and other adequate physical amenities. Building owners had been warned strictly against any kind of unlawful eviction. The State set the best example by providing food to workers through 'Community Kitchens' managed by Kudumbashree workers. Kerala has taken care of guest workers by providing them with decent accommodation, health care and all their needs during the lockdown period.

The Government of Kerala transported the guest workers in a phased manner back to their respective home destinations. As on 03/06/2020, 102 numbers of train had carried more than 1,38,870 workers to various home destinations. The rest were transported later.

In the wake of the COVID-19 pandemic containment activities, the Labour Department had started helpline/call centers in all districts, along with the Labour Commissionerate call centre that worked 24x7 to address the grievances of guest workers. An adequate number of multilingual personnel had been deployed in call-centers to converse with the workers and families.

The Kerala model of migrant management has been lauded by many. Kerala as a State has set an example for its systematic and organised labour welfare initiatives.

CHAPTER 2.4

SOCIAL MOBILISATION AND COMMUNITY PARTICIPATION

Social Mobilisation and Community Participation

Kerala has had a long history of social mobilisation and community participation in social provisioning. The peasant struggle of 1960s, literacy mission, public library movement, and people's planning are examples of such social mobilisation with large community participation in Kerala. The history of social movements in Kerala show that mass movements have led to major social transformations. The movements for social provisioning also depict a unique mix of both government intervention and people's participation.

History of Mass Movements in Kerala

A major chapter in the history of mass mobilisation in Kerala was the mass movements conducted by peasant organisations including Kerala Karshaka Sangham in the 1960s. These struggles at the beginning of 1960s emerged first as an attempt to get the Agrarian Relations Bill approved by the President of India, then to include the act in the Ninth Schedule of the Constitution of India to make it immune from the judicial processes, and later it developed into a mobilisation for implementation of the land reform. The Kerala Agrarian Relations Bill introduced in December 1957 for achieving the goal of land reforms was a turning point in the history of agrarian movements in Kerala. The government sought to confer ownership rights on tenant cultivators, to grant permanent ownership of land for the agricultural labourers, who reside in their premises at the mercy of landlords, and to attain an equal distribution of land by putting a ceiling on the individual land holdings so as to distribute the surplus land among the landless. Introduction of the Bill was a signpost in the history of land legislation in post-independent India. The Bill paved the way for a uniform system of agrarian relations throughout Kerala.

To popularise the issue, Kerala Karshaka Sangham engaged in multiple struggles during the period, including 26-day peasant march from Kasaragod to Thiruvananthapuram conducted in June 1960. The demands included setting up of more land tribunals, the speedy disposal of tenancy cases, implementation of the full provisions of the Kerala Agrarian Relations Act, and tax and debt relief. These mass movements formed the background on which the land reform laws were enacted and implemented in the State.

Initiated by the Government, the literacy campaign saw large participation from the people and mass organisations such as Kerala Shashtra Sahitya Parishad. Later on, it was taken up by such organisations as their own mission. These efforts were crucial in achieving high rates of literacy in the State. The total literacy movement in Kerala was first initiated at Ernakulam District and Kottayam Municipality in the late 80's. The campaign for total literacy in Ernakulam district of Kerala was a fusion between the district administration, voluntary groups, social activists and others, and was spearheaded by the Kerala Shashtra Sahitya Parishad (KSSP). Ernakulam achieved this objective on February 4, 1990 and along with it the unique distinction of being the first district in the country to become 'fully' literate. Ernakulam declared itself 'totally literate' and that

declaration led to the launching of a statewide campaign in Kerala, a campaign more challenging in size and complexity. The Kerala State Literacy Campaign covered 18 lakh persons in the age group of 6-60 years within a span of one year. On 18th of April 1991, Kerala became the first total literate state in India while the overall literacy of India was just 52 per cent.

Another significant achievement in spreading education was the library movement. Factors such as the national movement, the social reform movements, the formation of community organisations, the rapid growth of political consciousness, the struggle for responsible government, and the emergence of political parties during the 1920s and 1930s accelerated the growth of libraries and hastened the birth of library movement in Kerala. The beginning of public library movement in Kerala started in 1829 with the establishment of Thiruvananthapuram Public library, which is one of the oldest public libraries in India. The Kerala Grandhasala Sangham played the pivotal role in spearheading library movement in the State. It launched a mass and popular movement of establishing a network of libraries throughout the State. From the very beginning, the library movement took up the cause of literacy. The Sangham initiated a number of programmes such as adult education programmes, established nursery schools, condensed courses for women, and established libraries for spreading education. The library movement was a popular movement with active involvement of the masses.

Decentralised planning is one of the finest examples of community participation in the State. The Government of Kerala initiated people's planning in 1996 empowered by the 73rd and 74th amendment to the Indian Constitution. The people's plan campaign broadened and deepened the process of democratic decentralisation in the State.

Mass mobilisation and community participation in public service is a unique feature and strength of Kerala. The Government of Kerala in 2016 aimed to build on this strength and formulated missions and activities that would utilise this strength in achieving the objectives outlined in the Plan.

Social Mobilisation and Community Participation in Present Times

Second Phase of Democratic Decentralisation

The present Government initiated the second phase of democratic decentralisation. The last four years has seen major changes in the functioning of Local Governments in the State. Local Governments have become important institutions of governance for translating public action to effective outcomes. The role played by these institutions is exemplary be it floods of 2018 and 2019 or the Covid-19 pandemic. Decentralised and participatory process has helped Government to reach out to masses. Community participation in planning, in development process, and in emergency situations was significant in the last four years.

The second phase of People's Plan, launched in 2016, aimed to further consolidate and strengthen the role of local bodies in governance. At present, there are 1200 local governments in Kerala, which includes 941 Grama Panchayats, 152 Block Panchayats, 14 District Panchayats, 77 Taluks, 87 Municipalities and 6 Municipal Corporation. The recently held election to local bodies in the State in December 2020 has brought in new governments at the helm of affairs in all the tiers of government.

Haritha Keralam Mission

The Haritha Kerala Mission envisaged enhancement of cleanliness and environmental health of Kerala's water systems and to institute scientific waste management systems in the State. Haritha Kerala Mission activities including the revitalisation of the rivers and cleaning of the ponds were done with community participation. In many places, the youth organisations took it upon themselves to actively take up this activity.

Another important sphere of intervention was in the agriculture sector. Along with community participation through Kudumbasree, an initiative to form local groups of people interested in agriculture was undertaken by the youth organisations and other social organisations. They are engaged in farming activities across the State.

The Haritha Keralam Mission has done efficacious activities in the sector of water conservation and water preservation during the last four years in the form of river rejuvenation and cleaning activities at the water source. A total of 390 km of rivers and 41,529 km of streams were rejuvenated. The revival and rejuvenation of the Varattar river was made possible. Kuttemperoor River, Killiyar, Kolarayar, Vadakkepuzha, Chalamkode torrent, MuttamParappa torrent, Kamprayar, Perumthodu, Poonur river, Kottarakkara Pandivayal torrent, and other polluted water sources were cleaned and made free water flow possible. The Meenachilaar-Meenantharayar-Kodoorar reunion was also made possible. The rejuvenation of streams of Meenachilaar-Meenantharayar-Kodoorar was undertaken by making use of the social mobilisation potential of Kerala society together with the expertise of the Government department. A massive rejuvenation campaign was held on May 12, 2018 named "*All to water bodies*". The campaign saw participation from around 50,000 people from various spheres including from general public, residence associations, neighbourhood groups, self-help groups, schools, clubs, government officials, Kudumbashree, youth organisations, and people employed under National Employment Guarantee Scheme. People's participation was a major element in the rejuvenation of streams in the regions including those around Airattunada and Kottathil regions.

Through Meenachilaar-Meenantharayar-Kodoorar reunion measures, cultivation was resumed on more than 4000 acres. 54,362 wells have been recharged in the last four years; 23,158 wells newly constructed; 13,942 wells upgraded; 18,203 ponds were constructed and 23,628 ponds were upgraded. Through these activities, 1,21,81,650 cubic meters of water storage were ensured.

These activities were led by the Employment Guarantee Scheme (MNREGS) and with the support of local bodies.

The Haritha Keralam Mission organised a wide public campaign named *ini njanozhukatte* (Now, Let Me Flow) for recovery of water streams in the state. Through this 7,291 km of water streams in the state were cleaned and made free flow of water possible.

Another example of use of social mobilisation for the Haritha Kerala mission can be seen in the cleaning of the ponds at Chottanikkara and Mulanthuruthy. The cleaning of the two ponds saw the participation of the people, Kudumbashree, labourers, local youth club members and local stakeholders. National Service Scheme volunteers also participated in the renovation of Chottanikkara Vayalilpadam Pond.

Life Mission

Government of Kerala initiated a comprehensive housing scheme for the construction of new houses for homeless with land and housing complexes for the homeless without land under the Life Mission. The role of community participation and mass mobilisation in this regard needs to be pointed out. While the housing scheme was initiated by the Government of Kerala, different mass and class organisations, cooperative organisation, employees' unions, NGOs', philanthropic institution and individuals also took part actively in the provision of housing facilities to those without homes.

Floods

The floods of 2018 brought out the extent and strength of community participation in the State. People from all corners and all walks of life joined hands to support the affected persons. The response to crisis was one of widespread and selfless public action by the administration and citizens. The spontaneous social commitment and the spirit of fraternity shown by fishworkers and youth, who led some of the most heroic rescue and relief efforts, were exemplary. The speedy, meticulous, and people-oriented handling of crisis by the State won admiration from other parts of India and the world.

The spontaneous support from the fishworkers during the floods of 2018 requires a special mention. The fishworkers brought in the fishing vessels and undertook rescue operation for those who were stranded during the floods. As many as 669 boats went out with 4,537 fishworkers during floods. The use of the fishing vessels, the expertise of the fishworkers, location-specific knowledge of the local volunteers helped in efficient organisation of the relief and rescue operations.

Floods also saw the massive participation of the youth, in rescue activities, and procurement and distribution of the relief materials. The Government was also quick to realise the facts on the ground and facilitated the social mobilisation that emerged all across the State.

To organise these efforts in a more concerted manner in the future, the Government of Kerala created the coastal wardens, about 177 members of the fishing community including five women were appointed as coastal wardens. A youth brigade under the Kerala Youth Welfare Board was formed to prepare young volunteers with youth participation to adequately deal with the conditions presented by natural disasters. 1000 young people between the ages of 18 and 25 who are willing and capable were selected and recruited as volunteers. From these, 100 physically fit and dedicated youth were trained in disaster management and rescue operations and provided with the necessary rescue equipment. In addition, teams were set up in various areas such as counselling, technical expertise and surveying.

Covid-19

The covid-19 pandemic saw public action in its strongest form. Social mobilisations and local level involvement played a crucial role in containment of the pandemic and offering support and assistance to the needy. The Government started community kitchens and delivered cooked food and other provisions to the disadvantaged or those who were in quarantine.

BOX

Youth movements were pervasively present in the measures to combat the issues that rose out of Covid-19 and the associated lockdown. The volunteers of youth organisations cleaned the then yet-to-be completed Medical College hospital in Kasaragod so as to turn it into a Covid-19 speciality centre. The youth organisations took up the humanitarian act of cremating/burying the people who died because of the Covid-19 following the protocol in force at the time. The youth organisations were also present in the community kitchen preparing, packing, and distributing the food. Kerala State Youth Welfare Board formed Kerala Voluntary Youth Action Force in every nook and corner of the state to provide a helping hand to people unable to venture outside their houses for buying essential items and medicines on account of the lockdown. The volunteers reached out to the people on the basis of the phone calls received from them. The local volunteers of the action force collected money and drew up the list of items needed including medicines. These items were bought from the nearby grocery, vegetable, or medical shops and delivered to the needy.

The state government mobilised its resources to produce hand sanitizers and masks. Along with the public sector companies including Kerala Drugs and Pharmaceutical Ltd, youth movements and other organisations also began to produce hand sanitizer, and Kudumbashree began to produce masks.

Local self-governing bodies formed their emergency committees and set up groups to clean public areas. The mass organisations sanitized buses and set up sinks in bus stations for passengers to wash their hands and faces.

BOX

Kudumbashree created a three-tier whatsapp group to spread awareness among the people which currently has 1.9 lakh groups with 22.5 lakh members. Whatsapp network was used for "Break the Chain" campaign and motivational campaign. NHG loan linkage programme initiated through Kudumbashree as NHGs represents 45 lakhs families. Kudumbashree volunteers actively took part in the activities for material packing centres of LSGs. Kudumbashree in convergence with Local Self-Governments started Community Kitchen to prepare food and it was delivered to those under home quarantine and for needy people.

Kudumbashree units started production of cloth masks from March 15, 2020 onwards and rapidly increased their production. From March 15, 2020 to April 7, 2020 it produced 18.5 lakh masks. Starting from March 18, 2020 till April 7, 2020 Kudumbashree units produced 4492.85 litres of sanitisers.

All elderly in the home quarantine were mapped by Kudumbashree and they are being called regularly through phone connecting them to the health / local body if needed. Asraya and Snehitha Calling Bell activities were strengthened In the context of the pandemic, Snehitha focussed on giving mental support to people who are quarantined, their family members, elderly, women and children who are in the threat of domestic violence, and also to the general public.

More than 16,268 JLGs across the state voluntarily stood together for Community kitchens and donated their products generously for the social cause. Rice, banana, vegetables and tubers are the important categories supplied as per local availability and requirements. The collection, transportation and distribution activities are being organized and coordinated by respective district mission teams in rapport with the LSGI officials and peoples representatives.

Among these, the proactiveness with which the support system was build and administered for the guest workers through mass mobilisation deserves a special mention. The Covid19 pandemic and restrictions and lockdowns associated with it created a situation in which the students were not able to attend regular school classes. To ensure that the students are continuously engaged in the educational activities, Government of Kerala started online classes. The non-availability of the infrastructure for the students to attend online classes came up as an issue. The people of Kerala individually and as part of multiple mass and class organisation set out to provide TV to the students who lacked the facility to attend the classes. Certain groups provided their buildings and spaces for students to sit and watch online class regularly following covid19 protocol.

Fund Collection Drives for Chief Minister's Distress Relief Fund (CMDRF)

Contribution to the CMDRF has gained the identity of social mobilisation during the current government. The State faced with different natural disasters –floods and landslides of 2018 and 2019, and Covid19 pandemic – called upon the people to assist the government in its relief activities through the contribution to the CMDRF. Collection of funds for CMDRF was taken up as a campaign by the organisations, NGOs, and individuals.

BOX

Kozhikode Airport Accident

A more recent example of social mobilisation efforts is the rescue efforts undertaken after the flight crash at Kozhikode airport on August 7, 2020.

Following the incident, people from the area surrounding the airport rushed to the crash site and rescued trapped victims from the aircraft along with the authorities. Passengers were evacuated in about three hours and taken to various hospitals in Kozhikode and Malappuram districts. People also willing came forward to give blood to those victims who needed it. Undaunted by the pandemic, people came out wholeheartedly to undertake rescue efforts.

The history of social mobilisation and community participation in Kerala can be traced from the social reform movements and national struggles. It has played a prominent role in the development of the infrastructure for social provisioning. While the social mobilisation and community participation remain part of Kerala's socio-political fabric for long, it was after 2016 a concerted effort from the part of the Government to tap into this potential for the rebuilding of Kerala become stronger.

CHAPTER 2.5

ASSEMBLAGE OF A SKILLED LABOUR FORCE

Education and skills form the basis for a livelihood and labour centric growth as mentioned above. How prepared is Kerala to move in this direction? We take stock of the level of education and skills in the general population as reported in the PLFS 2018-19. We look at general education in Kerala, compared with All India, technical education and finally at vocational training.

Table 1 reports the level of general education in Kerala and India. As can be seen the share of population below primary level of education is only about 7 % in Kerala compared to the All India level of 27 %. Among the below primary level population is 19 % all India, while it is almost double at 35 % among women. Contrasting to this Kerala had only 6 % males below primary and women closely matched at 8%. The largest share of population for Kerala was with education of middle level schooling, at 29% followed by secondary level schooling at 20% and then higher secondary at 15%. While it can be stated that the educational achievement of Kerala population is higher than the All India average, when it comes to human capital as a resource for value added production the fact that about 79 % of the population had only higher secondary level of education or lower, may not augur well for an economy aspiring to grow on high technology and skill intensive sectors. As we had seen earlier, the current growth path of the economy is constrained by the skills available in the economy. The sectors that are attracting the school educated ones are the ones that are expanding, mostly, probably due to the easy availability of skills.

Table 1 *Level of General Education of Kerala and India population 2018-19 (percentage)*

	India				Kerala			
Level	Male	Female	Third Gen	Total	Male	Female	Third Gen	Total
Below Primary	19.4	35.0	46.0	27.2	6.0	7.9	0.0	7.0
Primary	12.0	12.1	9.6	12.0	7.7	8.6	34.4	8.2
Middle	23.4	19.0	16.1	21.2	29.9	27.3	41.6	28.5
Secondary	16.5	12.6	14.8	14.6	21.8	18.6	0.0	20.1
Higher Secondary	13.7	10.6	5.0	12.2	14.8	14.9	0.0	14.8
Diploma	1.9	0.7	1.0	1.3	7.7	5.8	0.0	6.7
Graduate	10.3	7.6	6.7	8.9	9.3	12.7	0.0	11.1
Post Graduate and above	2.9	2.5	1.0	2.7	2.9	4.3	24.0	3.6
Total	100	100	100	100	100	100	100	100

Source : PLFS 2018-19

Table 2 shows the share of population with some level of technical education. As can be seen most of the population does not have any form technical education in India. In Kerala the share of population that have had some form of technical education is marginally better than the national average. Even then the share is very large at 90 % having no technical education. This shows the lack of technical skills in the population. Without such skills the production of goods and services would also remain limited.

Table 2 *Share of population with Technical Education -Kerala and India population 2018-19*

	India				Kerala			
	Male	Female	3 rd Gen	Total	Male	Female	3 rd Gen	Total
Technical Degree	1.5	0.8	0	1.2	2	2.1	0	2.1
Diploma below graduate	1.8	0.7	0	1.2	7.3	6.6	0	7
Diploma above graduate	0	0.7	0.4	0	0.5	1	1.3	0
No Tech Edn	96	98	100	97	89.6	90.1	100	89.9

Source: PLFS 2018-19

Table 3 shows the share of population with some vocational training as of 2018-19. In this case the Kerala population is no different from the All India. More than 88% of the population in Kerala have not undergone any vocational training, same as that of the Indian average. Formal vocational training was acquired only by 3.8 % of the Kerala population. This brings out the lack of skill training at the national level and regional level.

Table 3 *Share of population with Vocational Training- 2018-19*

	INDIA			Kerala		
Training	Male	Female	Total	Male	Female	Total
Formal Vocational Training	2.8	2.0	2.4	3.4	4.2	3.8
Hereditary training	3.1	1.2	2.1	0.9	0.2	0.5
Self learning	3.5	1.5	2.5	0.7	0.4	0.5
On the job learning	5.3	1.2	3.3	5.9	1.3	3.4
Others	1.0	1.0	1.0	3.5	3.5	3.5
No training	84.3	93.1	88.7	85.6	90.4	88.2
Total	100	100	100	100	100	100

Source: PLFS 2018-19

Based on the analysis of education and skills it may be possible now to identify a category called the skill poor. Skill poor may be identified as that set of the population that has not undergone

any form of education or skill training, such that they have only their sheer labour power to contribute to the growth process. India has about 14.6 % of the population with no general education, no technical education and no vocational training in the rural areas and about 7 % in the urban areas. For Kerala this was 1.8% and 1 % respectively. Thus compared to all India, that share of the population that must depend on sheer labour power to earn their living is negligible in Kerala. Such a population may be called the skill poor. However, primary or less education with no technical or vocational training also does not count much of a skill as it provides only very basic language and mathematical skills. Table 4 shows various combinations of such gradations in terms of skill in India and Kerala. From the table it is visible that while Kerala has achieved much in terms of general education, it has had limited success in skill development, especially in terms of technical and vocational training. While general education helps in diversifying to various occupations, the lack of specialised skill training would limit the potential of a human capital oriented growth.

Table 4 *The Skill poor in India and Kerala 2018-19*

India						
	Rural			Urban		
	Male	Female	Total	Male	Female	Total
Not literate, no tech edn, no vocation tr.	8.8	20.6	14.6	4.1	10.1	7.1
Primary or less , no tech edn, no vocation tr.	14.0	15.2	14.6	10.0	11.4	10.7
Not literate but with tech or vocation tr.	16.8	18.9	17.8	10.9	12.9	11.9
primary or less(excluding illiterate) with tech or vocation training	14.8	12.1	13.5	13.2	11.5	12.3
More than primary	45.6	33.3	39.6	61.8	54.1	58.0
Total	100	100	100	100	100	100
Kerala						
Not literate, no tech edn, no vocation tr.	1.4	2.1	1.8	0.7	1.3	1.0
Primary or less , no tech edn, no vocation tr.	8.6	9.1	8.9	6.7	6.8	6.8
Not literate but with tech or vocation tr.	8.3	11.7	10.1	9.3	10.5	9.9
primary or less(excluding illiterate) with tech or vocation training	15.4	15.9	15.7	15.1	14.8	14.9
More than primary	66.3	61.1	63.6	68.2	66.7	67.4
Total	100	100	100	100	100	100

Source: PLFS 2018-19

The Government of Kerala has taken various measures to enhance the skill content in the Kerala population. One of the pioneering attempt is the setting up a non-profit public company, the Kerala Academy for Skills Excellence (KASE), as a nodal agency for carrying out skill development activities in the state³. This apex agency for skill development in Kerala has been incorporated under Section 25 of the Companies Act, 1956. KASE has the objective of developing the skills of young people in Kerala to meet international standards of employment. KASE aims to set up, support and manage institutions to enhance the employability skills of young people and their standards of competence, and promote technology that can meet the needs of various industries across the world. KASE also works as a public company that provides accreditations to institutions on the basis of their expertise in developing skills. It is managed by an Advisory Council headed by the Chief Minister as the Chairperson and the Minister for Labour and Skills as Vice Chairperson.

KASE works through the following four models:

1. **CoEs Centres of Excellence through International Skill Training and Employability Programme (iSTEP)**
2. **Community Skill Parks—Kaushal Kendra's**
3. Accreditation Programme
4. Skill Training Certificates

KASE works on a partnership basis with several organisations such as Erma Group, A Gulf-based conglomerate operating in oil and natural gas, power and utilities, travel, food, healthcare and automotive sectors; ICA: A nation-wide institution that provides training in accounts and finance; Sadhbhavana Group: A service provider in education, The NSDC a non-profit company under the Ministry of Skill Development and Entrepreneurship that provides funding for skill training; Team Lease: A company that works on a PPP model with various government departments across states in India, Pragmatic Educational Society: This organisation, with its objective of 'Skilling India', provides job-oriented courses and training among others.

Major Initiatives under KASE include *International Skill Training and Employability Programme (iSTEP)* which plans to set up CoEs in various fields under KASE, where the centres would be a public-private initiative. The private (or public) partner would, along with KASE, make a master plan for each CoE and act as an operator. The CoE will be managed by the operator and respond to market forces in designing and implementing courses such as Nursing, Oil rigging; Security personnel, teaching, hospitality, entrepreneurship. Besides CoEs, iSTEP chapters have been set up in ITIs and engineering colleges in Kerala that are similar to a youth cadre programme, training students in developing their skills and entrepreneurship spirit. These include iSTEP for students and iSTEP Youth Brigade.

³ The information given on the various initiatives of KASE and other skill development initiatives is drawn from Abraham and Sasikumar (2017)

Kaushal Kendras are community skill-training hubs focusing on the rural population. In these Kendras, students are provided training in technical and vocational skills through resources like the Assessment and Career Guidance Cell, Digital Laboratory, Language Lab and Multi-skill Centres. These help students in identifying and developing their aptitude, and give them access to resources for learning and developing their communication skills. The Multi-skill Centres provide round-the-year placement-linked practical learning.

KASE provides accreditation from the Government of Kerala to organisations conducting skill-training courses. The institutions seeking accreditation are obliged to have courses based on the approved syllabus and curriculum, have industry tie-ups for on-the-job training and internships, ensure placements for atleast 60 per cent of the students in each course, carry out research with domestic and foreign institutions and engage in consultancy support for the industry.

Skill Development Programme, ASSET (Advanced Soft Skills and English Language Training): KASE along with the Kerala State Welfare Corporation for Forward Communities set up ASSET, through which it plans to provide skill development and career guidance to young people. The programme seeks to identify the areas of interest of participants in the first phase and train them in the second phase. After completion of the training, the candidates are put in touch with companies through job fairs in employability centres under KASE.

Construction Academy—Indian Institute of Infrastructure and Construction (IIIC): An academy for developing skill sets in infrastructure and construction sector, by KASE. The institution plans to provide courses on construction engineering and management that are of international standards; it will also offer skill training in masonry, plumbing, electrical and other technical jobs. This training is expected to make people employable in national and international markets. Personnel from the level of workers to the higher managerial cadre will be trained and nurtured by the institution.

Kerala State Institute of Design (KSID): Merged with KASE in April 2014, Kerala State Institute of Design (KSID) seeks to promote education in design, technology and management skills. KSID functions with the support of the National Institute of Design, Ahmedabad.

Employability centres through KASE: Other than through the employment exchanges, the Government of Kerala plans to provide value added services via employability centres under KASE. Rather than trying to employ in the public sector alone (as employment exchanges aimed for), the employability centres under KASE seek to place the skilled and trained youth in the private sector as well.

SkillJobs⁴ is an exclusive Job Portal developed and managed by Department of Training, Government of Kerala, India for facilitating employment opportunities for Skilled Professionals and skilled workers. This Job Portal 'SkillJobs' will enable them to register and update their resumes and to be visible for the prospective employers all over the world.

⁴ <http://www.skilljobs.kerala.gov.in/jobportal.html>

Employability Centres: The Employability Centres conduct skill gap analysis through tests, which include technical and psychometric analysis, after which training is provided to fill this gap. After training, testing and certificates are issued to the successful candidates. Training is also provided in improving communication skills, attending job interviews, preparing CVs, etc.

Kerala's labour force participation rate had been declining, both among males and females, mostly due to increasing years of education, greater share of retirees among the aged and women's withdrawal from workforce, while the working age group, educated and males have increased their participation. In text book parlance this indicates the dominance of primary workers and exit of secondary workers, a sign of maturing labour supply (Abraham, 2013). This is also substantiated by the nature of employment in Kerala. For the first time, in 2017-18, there was a larger share of regular wage workers than casual wage workers. The industrial structure of employment in Kerala displays a maturing of structural transformation in employment as well, with more workers entering non-farm sectors. The trend of transformation we see in Kerala is similar to the All India trend, only more accentuated (Abraham, 2019). Women, though they continue to be highly concentrated within a few sectors, are diversifying to non-traditional sectors. There are signs of movement towards higher skills among both males and females in both sectors. However, such movement to non-conventional sectors are slow, and a fifth of the total employment still continues to be in elementary occupation. The change in the educational composition of workers in the sectors seems to suggest that the overall productivity growth in the economy was indeed driven by two factors, namely, changes in sectoral growth and increasing skill component in high productivity sectors. This indicates that education and skills play a very important role in productivity growth in the economy. Yet as per the current patterns most sectors do not attract educated workers. There is a marked shift in the nature of employment from casual wage employment to regular wage employment. In terms of industrial distribution of workers, women workers are highly concentrated in a few sectors compared to males but this condition is slowly changing. Since 2011-12 there has been a turnaround with the share of organised sector employment increasing in both rural and urban areas across both males and females.

High reservation wages and slow growth of labour absorbing sectors have pushed up both unemployment and underemployment in Kerala, which had recorded high unemployment rates in the past. Unemployment among the educated youth, 15-29 age group and 30-44 age group is the severest. Moreover, the trend seemed to accentuate during the period 2011-12 to 2017-18. This is really worrisome as Kerala has an increasing share of population who are undergoing higher education. It is essential that the future of Kerala's development path is locked on to the future of this educated.

In terms of broad policy focus, the state needs to accelerate the pace of transformation in the labour market, mainly through demand-side interventions. In the experience of developed and many developing countries, it was the supply side transition that was difficult and long drawn. In Kerala, this supply side transition was achieved in a relatively short span through public action and state intervention. But the concomitant demand-side transition had been slower. Both the size and composition of labour demand require state attention for such a transformation from low value adding employment to high value adding employment. Currently, the typical conditions of the vicious cycle of poor demand conditions and resultant low wages in a developing economy, is being tackled through institutional and state interventions such as state contributed welfare and social security measures for the workers. The long-term viability of such interventions of the state depends on the fiscal capacity of the state.

Given that labour demand is derived demand, the labour market transition to high-productivity and high-wage economy is closely linked to the development path that Kerala would take. The recent history of Kerala directs us to a development vision that must encompass economic growth and transformation that is ecologically sustainable and socially equitable. Such a vision would demand a state-driven institutional environment with the following specifics: an institutional environment that encourages entrepreneurship; an innovation system that can transform product and process regimes leveraging institutions of innovation and new technology; an institutional environment that encourages sustainable use of local resources, both human and physical; access and participation of the marginalised in the transformation and its benefits; a skill development eco-system that encourages public-private cooperation and responds efficiently to market demand. Growth with equity and sustainability can be the imagined future for Kerala and in its course transform the nature of labour demand within the state as well.

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CHAPTER 3: TAPPING NEW GROWTH OPPORTUNITIES

CHAPTER 3.1

INDUSTRY: A NEW WAY FORWARD

Part 1: Structure and Growth of the Industrial Sector

The manufacturing sector in Kerala is relatively small in size. It accounted for a share of only 12.8 per cent of Kerala's Gross State Value Added (GSVA) (at constant 2011-12 prices) and 11.8 per cent of total employment in the State in 2017-18.⁵ In comparison, the manufacturing sector accounted for 18.0 per cent of India's and 29.3 per cent of China's GDP in 2017.⁶

I. A Revival in Manufacturing in Kerala

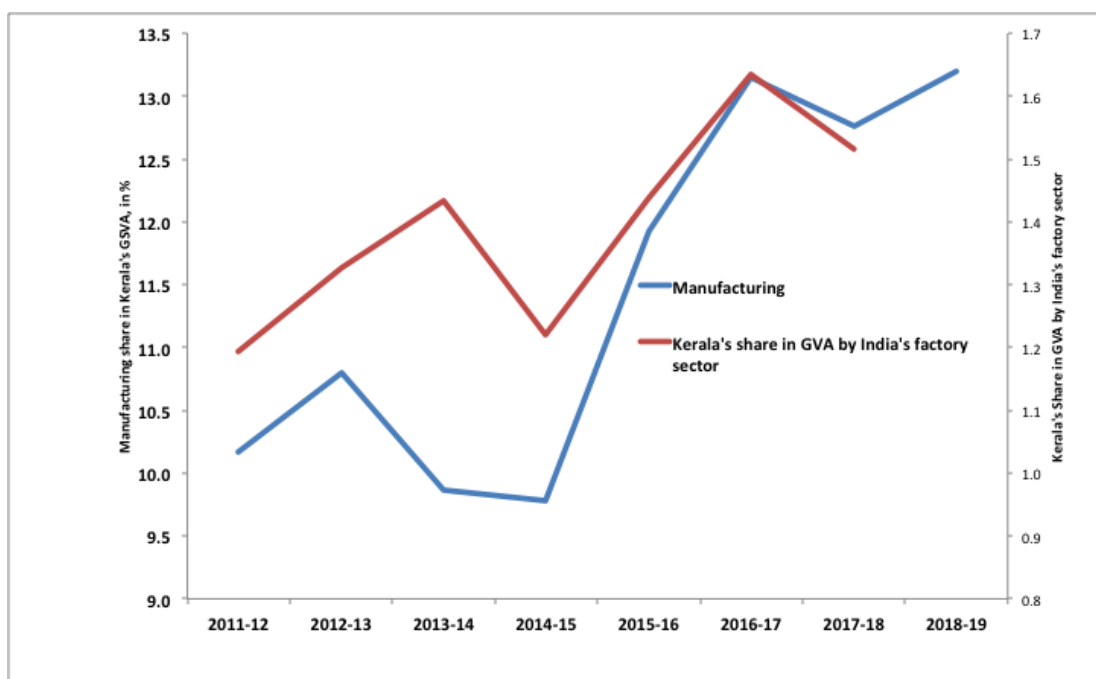
At the same time, it needs to be highlighted that there has been a steady increase in the size of Kerala's manufacturing sector, in value terms, especially so over the last four years. More importantly, Kerala has achieved substantial progress with respect to modernizing and diversifying its industrial sector.

The share of manufacturing in Kerala's GSVA increased from 9.8 per cent in 2014-15 to 13.2 per cent in 2018-19. According to data from Annual Survey of Industries, Kerala's share in gross value added by India's factory sector increased from 1.2 per cent in 2014-15 to 1.5 per cent in 2017-18 (see Figure 1).

Figure 1: Manufacturing's Share in Kerala's GSVA and Kerala's Share in GVA by India's factory sector

⁵ Employment data based on the Periodic Labour Force Survey (PLFS) carried out by India's Central Statistical Office in 2017-18.

⁶ Manufacturing as a share of India's GVA at basic prices in 2017-18. The Chinese share is obtained from the World Bank's *World Development Indicators*. Available at: <http://data.worldbank.org/indicator>.



Source: Directorate of Economics and Statistics and Annual Survey of Industries

According to the Periodic Labour Force Survey (PLFS) data, the manufacturing sector in Kerala employed 15 lakh workers (which comprised 12.8 per cent of the State's total workforce of 127 lakh) in 2017-18. They include workers in the factory sector numbering 3.1 lakh in 2017-18. The factory sector is almost identical with the organized manufacturing sector. The factory sector comprises factories that employ more than 10 workers and operate with the aid of electric power (as well as factories that employ more than 20 workers without the aid of electric power). Annual Survey of Industries (ASI) published by the Government of India's Ministry of Statistics and Programme Implementation (MOSPI) is the main source of data on the factory sector. In 2017-18, 3.1 lakh factory workers in Kerala were employed in 7649 factories across the State (see Table 1; see also Tables 2 and 3).

Table 1: Key Aspects of the Factory Sectors of Kerala and India, 2017-18

	Kerala	India	Kerala's share in India, in %
Number of factories	7649	2,37,684	3.22
Number of factory workers	3,10,326	1,56,14,598	1.99
Fixed capital, in Rupees lakh	43466	3293410	1.32
Gross Value Added, in Rupees lakh	22342	1474854	1.51

Source: Annual Survey of Industries, as reported in Thomas (2020).

Workers in traditional industries, importantly coir, cashew and handloom, form a substantial share of Kerala's manufacturing workforce. In fact, a few resources-based industries accounted for 42.3 per cent or 1.35 lakh workers out of the 3.1 lakh workers in Kerala's factory sector (in 2016-17). These industries include: food products and beverages (cashew processing is a major component of this), beedi manufacturing, and textiles (which include coir processing and handlooms).

It needs to be noted that there has been a substantial reduction over the years in the size of the workforce engaged in traditional industries in Kerala. This is because of structural problems faced by some of these industries (such as cashew) as well as the withdrawal of younger generation of educated workers from industries characterized by low wages. See Tables 4 and 5 on the structure of manufacturing sector in Kerala.

At the same time, it is worth highlighting that a new set of modern industries is growing in size in Kerala. The top industries in Kerala with respect to value added are chemicals, refined petroleum products, rubber and plastic products, electronic products, and pharmaceuticals and medicinal botanical products.

A More Modern Industrial Sector

With the above-referred structural changes, Kerala's factory sector has become more modern and technologically more advanced. With respect to the cumulative investment in fixed capital in India's factory sector, Kerala's share was only 0.79 per cent in 2011-12, but rose impressively to 1.32 per cent by 2017-18. This implies that investment in the factory sector in Kerala has grown faster than the corresponding national average during the years after 2011-12. Faster rate of investment has resulted in gains in output and value added growth for Kerala. With respect to gross value added by India's factory sector, Kerala's share was only 1.10 per cent in 2011-12, rose to 1.44 per cent in 2015-16, and rose still further to 1.51 per cent by 2017-18 (see Table 2).

Table 2: *Key Aspects of the Factory Sector: Kerala's Shares in India, 2011-12 to 2017-18*

	2011-12	2015-16	2017-18
Number of factories	3.23	3.25	3.22
Number of factory workers	2.93	2.37	1.99
Fixed capital	0.79	1.37	1.32
Gross Value Added	1.10	1.44	1.51

Source: Annual Survey of Industries, as reported in Thomas (2020).

In 2011-12, fixed capital per factory worker was Rs.3.9 lakh in Kerala while the corresponding national average was Rs. 14.5 lakh (both in current prices). Thus fixed capital invested per factory worker in Kerala was only 27.1 per cent of the national average in 2011-12. However, by 2017-18, fixed capital per factory worker in Kerala improved considerably to reach 66.4 per cent of the national level (see Table 3).

Table 3: *Key Ratios related to the Factory Sector; Kerala and India, 2011-12 to 2017-18*

Fixed capital per worker in Rupees Lakh

	Kerala	India	Ratio for Kerala as a share of the ratio for India, in %
2011-12	3.9	14.5	27.1
2015-16	11.3	19.6	57.7
2017-18	14.0	21.1	66.4

Gross Value added per employee in Rupees Lakh

	Kerala	India	Ratio for Kerala as a share of the ratio for India, in %
2011-12	2.7	7.3	37.7
2015-16	5.4	8.9	60.6
2017-18	7.2	9.4	76.2

Emoluments (annual) per employee in Rupees Lakh

	Kerala	India	Ratio for Kerala as a share of the ratio for India, in %
2011-12	1.1	1.6	66.8
2015-16	2.0	2.4	84.1
2017-18	2.3	2.7	87.6

Fixed capital per factory in Rupees Lakh

	Kerala	India	Ratio for Kerala as a share of the ratio for India, in %
2011-12	219.9	896.1	24.5
2015-16	507.2	1205.3	42.1
2017-18	568.3	1385.6	41.0

Source: Annual Survey of Industries, as reported in Thomas (2020).

With the infusion of industrial investments into the State, Kerala's factory sector has achieved greater competitiveness. With respect to emoluments received per factory worker as well as labour productivity, Kerala has lagged behind the corresponding national averages. As already mentioned, this is partly because of the continuing dominance of traditional industries in total factory employment in Kerala. In 2011-12, the salary received by an average factory employee in

the State was 66.8 per cent of the salary received by an average factory employee in the country as a whole. At the same time, gross value added per factory worker in Kerala was only 37.7 per cent of the corresponding national figure (in 2011-12). In other words, in 2011-12, Kerala's factory sector had lagged behind the corresponding national averages much more with respect to labour productivity than with respect to emoluments per worker (see Table 3; also see Thomas 2020).

However, by 2017-18, there was a substantial improvement for Kerala's factory sector both with respect to labour productivity and emoluments per worker. These figures for Kerala were 76.2 per cent and 87.6 per cent respectively of the corresponding Indian averages (by 2017-18) (see Table 3; also see Thomas 2020).

Table 4: *Structure and Relative Size with respect to Employment and Value Added: Shares of Industries in total factory sector of Kerala and Shares of Kerala's Industries in total by the respective industries in India, 2016-17*

Industries	Shares in Kerala's total factory sector		Kerala's Shares in India	
	Employment	Value added	Employment	Value added
Food Products and beverages (10, 11)	30.5	11.9	5.3	1.4
Tobacco products (12)	4.8	0.3	3.3	0.2
Textiles (13)	6.9	2.9	1.4	0.6
Garments (14)	2.6	1.5	0.7	0.7
Footwear (15)	2.7	1.6	2.2	2.0
Wood and wood products (16)	2.6	0.9	9.0	2.8
Paper and paper products (17)	1.1	0.4	1.4	0.3
Printing and reproduction of recorded media (18)	1.9	4.8	3.8	5.9
Refined petroleum products (19)	4.2	12.1	8.7	1.0
Chemical products and pharmaceuticals (20, 21)	6.6	19.2	1.4	1.2
Rubber and plastics products (22)	7.2	10.5	3.3	2.7
Other non-metallic mineral products (23)	6.0	4.7	1.8	1.0
Basic metals (24)	1.5	1.2	0.5	0.2
Fabricated metal products (25)	1.5	0.7	0.7	0.2
Electronic, computer and optical Products (26)	4.2	5.2	6.0	2.3
Electrical Equipment (27)	1.6	1.6	1.0	0.4
Machinery and equipment (28)	0.8	0.7	0.3	0.1
Motor vehicles (29)	0.1	0.1	0.0	0.0

Other transport equipment (ships and boats)(30)	1.6	3.5	1.6	1.5
Furniture, jewellery, medical and dental instruments, toys (31, 32)	2.4	10.0	1.8	5.6
All Industries	100	100	2.1	1.0

Note: Figures in brackets refer to the divisions (in two digits) to which each of these industries belong according to National Industrial Classification (NIC) – 2008.

Source: Annual Survey of Industries data on persons engaged and gross value added.

Turnaround in the Performance of Public Sector Units

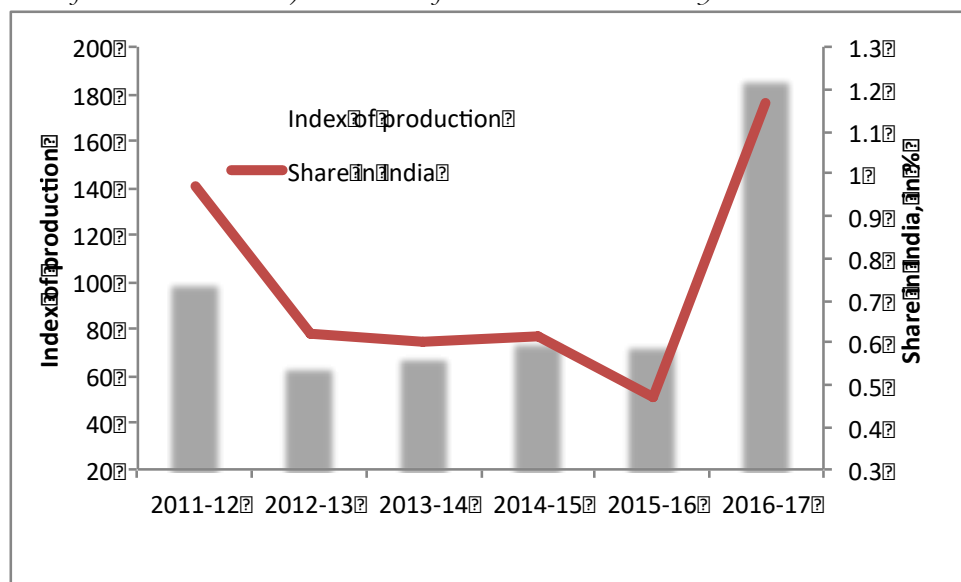
The progress that Kerala's industrial sector has achieved with respect to modernization over the last few years has been partly on account of the improved performance of public sector units, especially State public sector units, in Kerala. Bharat Petroleum Corporation Limited's (BPCL)-Kochi Refinery has been undergoing a major expansion of its refining and petrochemical production capabilities and this holds great promise for the chemical and allied industries in Kerala. Between 2011-12 and 2016-17, the value addition by refined petroleum products increased by eight times in Kerala. In fact, the growth of value added by manufacturing sector as a whole as well a number of industries including chemicals, garments, pharmaceuticals, furniture, jewellery and medical instruments has been much faster in Kerala compared to the corresponding national averages (according to ASI data).

Kerala has a number of State and Central public sector units engaged in diverse areas of manufacturing, mainly chemicals, engineering and electronics. Some of the PSUs in the State, such as Travancore Cochin Chemicals (TCC) and Keltron, have been pioneers in the country in their respective fields of production (caustic soda and electronics respectively). However, the performance of many of the PSUs in Kerala has been rather lacklustre during the recent times. A major highlight of the improved performance of Kerala's manufacturing sector from 2016-17 onwards is a turnaround in the performance of some of these PSUs, engaged mainly in the production of chemicals and electrical machinery.

Kerala Minerals and Metals Limited (KMML), Travancore Titanium Products (ITP) Limited, Travancore-Cochin Chemicals Limited (TCC) and Transformers and Electricals Kerala (TELK) Limited were some of the major PSUs, which sharply improved their performance from 2016-17 onwards. All the above-referred PSUs except KMML had registered losses in 2015-16. However, in a significant turnaround, all these four State PSUs made substantial profits in 2016-17. Kerala State Drugs and Pharmaceuticals (KSDP) Limited, which turned profitable by 2017-18, has been going through a significant phase of modernization and capacity expansion. Figure 2 shows that, by 2015-16, value added in chemicals and pharmaceutical industries in Kerala had declined to 73 per cent only of the corresponding value in 2011-12, However, in 2016-17, value added by these

industries improved sharply to 187 per cent of the 2011-12 level (see Figure 2; also see Thomas 2020).

Figure 2: Chemicals and Pharmaceutical Industries in Kerala: Index of Production (Gross Value Added) (with index for 2011-12 = 100) and Share of Kerala in value added by these industries in India



Source: Annual Survey of Industries.

New Opportunities in Modern Industries

Another positive aspect has been the emergence of a few new modern industries in the State, especially in the private sector. The number of workers engaged in the manufacture of electronic components in Kerala rose from 2930 only in 2012-13 to 10263 by 2016-17 (see Table 5). Workers engaged in the manufacture of medical and dental instruments and supplies increased from 1023 only in 2012-13 to 3207 in 2016-17 (see Table 5).

Table 5: Employment in Selected Major Industries, Kerala and India, 2016-17, in numbers

Industries	Kerala	India	Kerala's share in India
Rubber products (221)	15506	210679	7.4
Refined petroleum products (192)	13203	130938	10.1
Chemical products (201, 202)	11036	761630	1.4
Manu of electronic components (261)	10263	83890	12.2
Pharmaceuticals, medicinal chemical and botanical products (210)	10154	679891	1.5
Footwear (152)	8498	265036	3.2
Garments (141)	8384	778319	1.1
Plastic products (222)	7450	489824	1.5
Printing and services related to printing (181)	6177	160407	3.9

Ships and boats (301)	4320	17967	24.0
Electric motors, transformers and generators (271)	3548	200804	1.8
Medical and dental instruments and supplies (325)	3207	60762	5.3
Furniture (310)	3151	70189	4.5

Source: Annual Survey of Industries data.

A highlight of this positive transformation has been the emergence of a class of Kerala-based entrepreneurs who have been successful in setting up a number of technologically advanced enterprises. Some of these units in areas such as medical equipment, spice extraction and food processing have achieved international recognition for the quality of the products they produce (such as bold bags or oleoresins). In recent years, Kerala has emerged as a highly favourable location for technology startups, with the Kerala Startup Mission and other institutions playing an important facilitative role.

Kerala's Strengths in Micro and Small Industries

Kerala's share in India with respect to micro, small and medium enterprises (MSME) is bigger than Kerala's share in India's population (which was 2.76 per cent in 2011). We have data on unincorporated non-agricultural enterprises (excluding construction) in India from the 73rd round of the National Sample Survey (NSS). According to this data, there were 23.8 lakh unincorporated non-agricultural enterprises (excluding construction) in Kerala in 2015-16 employing a total of 44.9 lakh workers. This may be compared to the size of the non-agricultural workforce in Kerala, which was 105.7 lakh in 2017-18, according to the latest PLFS (the size of Kerala's workforce was 127 lakhs in that year) (see Table 6; also see Thomas 2020).

Table 6: *Unincorporated non-agricultural enterprises (excluding construction) and workers, Kerala and India, 2015-16, in lakh numbers*

	In lakh numbers				Kerala's share in	
	Kerala		India		India, in %	
	Enterpris es	Workers	Enterprise s	Workers	Enterpris es	Workers
OAEs	17.9	21.2	533.6	690.8	3.3	3.1
Establishments	5.9	23.7	100.3	421.9	5.9	5.6
Total	23.8	44.9	633.9	1112.7	3.8	4.0
Enterprises by sector						
Manufacturing	5.5	10.1	196.6	360.4	2.8	2.8
Trading	7.4	14.5	230.4	387.4	3.2	3.7
Other Services	10.9	20.3	206.9	364.8	5.3	5.6
Total	23.8	44.9	633.9	1112.7	3.8	4.0

Source: 73rd round of the National Sample Survey (NSS) on unincorporated non-agricultural enterprises (excluding construction), July 2015-June 2016.

Unincorporated non-agricultural enterprises in Kerala comprised 17.9 lakh own-account enterprises (OAEs) with a total workforce of 21.2 lakh and 5.9 lakh establishments with a total workforce of 23.7 lakh. OAEs are enterprises that run without any hired worker employed on a regular basis while establishments employ at least one hired worker on a regular basis (see Table 6; also see Thomas 2020).

In 2015-16, Kerala's share in India with respect to unincorporated non-agricultural enterprises was 3.8 per cent. If we consider only the establishments, Kerala's share in India was 5.9 per cent (see Table 6; also see Thomas 2020).

Unincorporated non-agricultural enterprises in Kerala comprised 5.5 lakh manufacturing enterprises, 7.4 lakh trading enterprises, and 10.9 lakh enterprises in other services activities (in 2015-16). Employment in unincorporated manufacturing enterprises in Kerala was 10.1 lakh, which was 2.8 per cent of the corresponding employment at the national level (according to PLFS data, total manufacturing employment in Kerala in 2017-18 was 15 lakh).

In 2015-16, annual gross value added (GVA) per worker in unincorporated OAEs and establishments in Kerala were Rs.1.16 lakh and Rs.7.60 lakh respectively. The corresponding national averages were Rs.0.95 lakh and Rs.6.4 lakh respectively. Average annual emoluments received hired worker was Rs.1.26 lakh in Kerala compared to the national average of Rs.0.87 lakh (see Table 6; also see Thomas 2020).

According to data from the Directorate of Industries and Commerce, Government of Kerala, 65,662 new MSME units started operations in Kerala during the five years from 2015-16 to 2019-20. While 15,138 of these enterprises were in the services sector, more than 33,000 new enterprises were started in the manufacturing sector (between 2015-16 to 2019-20). Of these, the major investment had been into agro- and food processing industries (11,286 new enterprises), followed by textiles and garments (8308 new enterprises) and light engineering industries (7764 new enterprises) (see Table 7).

Table 7: *Year wise details of new MSME units started in Kerala under each subsector*

Name of subsector	2015-16	2016-17	2017-18	2018-19	2019-20*	Total
Agro and Food-based	2388	2395	2553	2712	1238	11286
Textiles and	1910	1695	1947	1858	898	8308

Garments						
General /mechanical/light Engineering	2003	1606	2001	1533	621	7764
Service Activities	3134	3057	3679	3259	2009	15138
Wood Products	891	775	871	644	280	3461
Cement Products	385	344	469	329	141	1668
Printing & Allied	366	322	392	348	162	1590
Paper Products	190	158	163	192	80	783
Information Technology	349	263	316	294	116	1338
Others	4243	3098	3077	2657	1251	14326
Total	15859	13713	15468	13826	6796	65662

*Data only up to 30/09/19.

Source: Directorate of Industries & commerce.

Part 2: Sources of Growth

I. Agro- and Food-Processing Industries

As the Approach Paper to the Thirteenth Five-Year Plan notes, there are immense opportunities in Kerala for the development of food-and agro-based industries, particularly industries that have deep linkages with Kerala's agricultural and natural resources. The potential for the growth of agro-based industries in Kerala arises on account of both supply and demand factors. On the supply side, Kerala produces a rich variety of agricultural products, including rice, coconut, rubber, pepper, cardamom, banana, and pineapple. The State has enormous forest and marine resources.

On the demand side, a relatively large market for food and agro-based products exists within Kerala. Average per capita consumption expenditure in rural Kerala is almost twice as large as the average per capita consumption expenditure in rural India (in 2011-12, according to National Sample Survey data). However, there are also important challenges for the growth of agro- and food-based industries in Kerala. Some of these challenges are discussed below.

Revival of Agricultural Production -- Critical for the Growth of Agro-Based Industries

A sharp increase in the production (as well as productivity in cultivation) of agricultural products such as coconut and spices is critical for the growth of agro-and food-processing industries in Kerala. The promotion of food and agro-based industries in the State should go hand-in-hand with the mission for building a *Haritha Keralam*. In fact, the setting up of processing industries, which will help to ensure higher returns to farmers for their agricultural products, will be an essential complement to any plan to revive agricultural production in Kerala.

Evolving New Models for Procurement of Agricultural Products

A distinctive feature of the agricultural sector in Kerala is the domineering role played by small farmers, who carry out cultivation in homestead or other small plots of land. At the same time, however, the smallness in size poses a challenge with respect to the collection and procurement of agricultural products, both for farmers and for the processing industries (Thomas 2020).

Given the absence of a sufficient network for the procurement of agricultural products, farmers of several agricultural products often complain that they do not get good prices for their products (especially products such as jack fruit, which do not have much commercial value within Kerala). At the same time, agro-processing industries, especially small and medium enterprises, find it difficult to deal with the large numbers of small farmers spread across the State when they have to procure agricultural products as raw material for their industries.

While Kerala is known to be a major producer of a rich variety of agricultural products, very little of the processing of these products occurs within the State. At the same time, the existing agro-processing industries in Kerala suffer due to shortage of raw material or source raw material from outside the State. Some of the jackfruit-processing and spices-extraction unit units in

Kerala have pointed to the difficulty in collecting the rawmaterial (jackfruits or spices) from Kerala although the State is a large producer of these products (Thomas 2020).

Kerala is a major producer of pineapple (especially Ernakulam, Kottayam and Idukki districts). Vazhakkulam in Ernakulam district has emerged as a leading centre in the country in the trading of pineapple. Despite the easy availability of pineapple within the State, there is very little activity in Kerala in pineapple processing and value addition. This is a severe loss of opportunity for the State as value-added products from pineapple are likely to attract huge markets within the country and outside (including in East Asian countries and countries in the Middle East). Pineapple farmers in Kerala point out that processing of pineapple within the State will help them in achieving higher and more stable prices for pineapple (Thomas 2020).⁷

Processing of Meat, Milk and Egg

Kerala is a major consumer of meat, milk and egg products. The State can do much more in generating employment opportunities in these sectors based on the large domestic demand. As of now, Kerala depends on imports to meet a large share of its requirements of meat, milk and egg products. There is very little processing of these products within the State. Even facilities such as modern slaughterhouses are relatively scarce in the State. Setting up of industrial units and modern facilities for the processing and value addition of meat, milk and egg will help to satisfy the demand for these (value-added) products within the State and also aid employment generation in this sector. This will also encourage more farmers in Kerala to take up animal husbandry and poultry farming, and also to adopt modern methods of production and value addition in these economic activities.

As in other parts of India, the facilities for storage and transport of fruits, vegetables and other agro-based products from the farm to the market (cold storages, for instance) are poor in Kerala too.

Benefits to Health and Tourism Sectors

A revival of the agricultural sector and agro-processing industries in Kerala will have hugely beneficial impacts in the areas of health and tourism in the State. Easier availability of better (tastier and healthier) food products will be a big boon for the local population as well as for tourists. Kerala has much to learn from the East Asian countries including Thailand, Malaysia and Taiwan in successfully combining agriculture, agro-processing industries, tourism, and the

⁷ Vazhakulam Agro And Fruit Processing Company Limited (VAFPCCL), which is owned jointly by Kerala State Government (70%) and farmers in the region (30% of the total shares). has been set up with the objective of processing and value addition of fruits including pineapple, mangoes, and ginger. The company is located in Vazhakkulam in Ernakulam district, is well connected to Kochi International Airport and the Kochi Sea Port by road. VAFPCCL has facilities for processing (including juice extraction and concentration and Aseptic filling of fruit juices like pineapple and mango) of fruits. The factory has facilities for production of juices in Tetra Pak packages. VAFPCCL also has an Integrated pack house, which has facilities for pre-cooling and packing of fresh pineapple and other fruits (which can be further exported). VAFPCCL has the potential to emerge as a major player in the processing of fruits and vegetables produced in Kerala (and also Tamil Nadu), especially in the Ernakulam, Idukki and Kottayam districts.

hotel and restaurant business. There should be a conscious campaign in the State to include greater amounts of locally grown vegetables and fruits in Malayalee cuisine.

Ii. Chemical and Petrochemical Industries

Expansion by BPCL-Kochi Refinery and its Implications

Bharat Petroleum Corporation Limited's (BPCL)-Kochi Refinery has undertaken a major expansion (investment amounting to Rs.4588 crores) of its refining capacity, and this holds great promise for the chemical and allied industries in Kerala. After its expansion, BPCL-Kochi Refinery's refining capacity is expected to increase from the current 9.5 million metric tons per annum (MMTPA) to 15 MMTPA. BPCL-Kochi Refinery will then have the largest refining capacity among public-sector refinery units in India. With the increase in its refining capacity, BPCL-Kochi Refinery will be producing approximately 300,000 MMTPA of Propylene and 90,000 MMPTA of Ethylene. Propylene and Ethylene are key ingredients for a wide range of downstream industries in the areas of petrochemicals and specialty chemicals.

Petrochemical Complex at Kochi

The State government has plans to set up a petrochemical complex at Kochi in land owned by Fertilizers and Chemicals Travancore Limited (FACT). After its completion, the petrochemical complex is likely to attract large private investments in the area of chemicals and petrochemicals. The upcoming complex will have some distinct advantages, given its proximity to BPCL-Kochi Refinery, Petronet LNG Limited, chemical units such as Travancore Cochin Limited (TCC), and port facilities. There is potential to begin the manufacture of plastics, polymers, fibers, and personal and home care products in the private sector.

Petrochemicals, Specialty Chemicals, Biochemicals and Pharmaceuticals

Kerala has bright prospects in the areas of petrochemicals, specialty chemicals and pharmaceuticals. It is easier to convert the output from these industries into products that have a ready market in Kerala.

Petrochemicals are key ingredients for a wide variety of products including industrial grade paints and coatings, latex paint formulations, water proofing paints, bonding, adhesion and hardening chemicals, adhesives for plastic tapes, labels, self-adhesive envelopes, medical and construction adhesives, new generation plastics and plasticizers, all-purpose plasticizer for PVC and vinyl chloride copolymers, herbicides, plasticisers and textile finishing, super absorbent polymer used for diapers, rheological modifiers in surface coatings, personal care products, benign dyestuffs and non-phosphate detergents (Sukumaran Nair, 2020).

Specialty chemicals include adhesives, agrichemicals, cleaning materials, cosmetic additives, construction chemicals, elastomers, flavors, fragrances, food additives, industrial gases, lubricants, polymers, surfactants, and textile auxiliaries (Source: https://en.wikipedia.org/wiki/Speciality_chemicals)

Biochemicals is another area in which there is great potential for growth in Kerala. Biochemicals include “enzymes, hormones, pheromones, etc., which either occur naturally or are manufactured to be identical to naturally occurring substances.” (Source: <http://www.businessdictionary.com/definition/biochemicals.html>). One of the distinguishing features of the biochemical industry is that its products are typically of low volumes but of high value. The applications of biochemical include oleoresins, natural pesticides, therapeutic products, and human insulin. A Kerala-based company Synthite is a major player in the production of oleoresins. Agricultural and natural resources of Kerala will have greater industrial applications with the emergence of a dynamic biotech and biochemical industry (for example, oleoresins are produced from spices or herbs).

Building Linkages

There exist some linkages between units in the chemicals and petrochemical sector in Kerala. The notable ones include the relationship between BPCL-Kochi Refinery and TCC (Ethylene produced by BPCL-Kochi Refinery and chlorine produced by TCC are used to produce PVC). Other units that collaborate by using each other's products are TCC and KMML and TTP and Malabar Cement. There should be greater number of such collaborations (to use each other's products), particularly in the context of the increased refining capacity of BPCL-Kochi Refinery.

Prospects in Bulk Chemicals

Bulk chemicals form an important category of chemical products manufactured by State PSUs in Kerala (for example, caustic soda produced by TCC). Bulk chemicals are basic ingredients for several industries. At the same time, it is difficult to transport bulk chemicals over long distances. Therefore, the expansion in the production of bulk chemicals in Kerala should be guided by the demand emerging from downstream industries (that use bulk chemicals) within the State. It may not be easy to sell bulk chemicals produced in Kerala in other States.

Paint Industry

Paint industry is another area in which Kerala-based firms will have good potential, given the availability of petrochemical ingredients from BPCL-Kochi Refinery. As is well known, there is a large market for paint in Kerala, especially paint used for house construction purposes. At the same time, more than 80 per cent of the paint consumed in Kerala today is manufactured outside the State.

However, it may be difficult for a new private player from Kerala to compete head on with the established players in the consumer paint industry in India. One possibility is that Kerala-based firms could find some niche areas within the paint industry, such as industrial paint or corrosion resistant paint.

Titanium Minerals

The mineral sands available along the coastal regions of Neendakara and Kayamkulam are rich in Titanium and Zirconium, which have applications in a range of industries, including electronics, electric vehicles, aviation, aerospace, and chemical and defence production industries. Kerala has to fully exploit the potential of its rich mineral sands by way of sustainable mining, mineral separation, and further conversion to value added products. As of now, State public sector units, KMML and TTP, are engaged in value addition, with the production of Titanium dioxide (Sukumaran Nair, 2020).

The current demand for Titanium dioxide is indeed huge in India. In fact, domestic production accounts for only 27 per cent of the total demand for Titanium dioxide in the country. The rest (73 per cent) of the domestic demand is met by imports. KMML can make use of this large demand (for Titanium dioxide) for its future growth. While KMML's main strength is its capability to produce Titanium dioxide in large volumes, TTP's strength is mainly in producing versatile products based on Titanium. TTP has the potential to enter into specialty chemicals and specialty paints, such as paint in prussian blue colour.

There are possibilities for the setting up of an industrial complex (in, for instance, Chavara) for the manufacture of downstream products based on titanium and zirconium. Previous studies have identified the technical feasibility and commercial viability for the manufacture of titanium mill products, zirconium carbonate and pearlescent pigments. Various Titanium mill products (following metallurgical processing out of titanium sponge) include tubes, sheets, bars, pipes, and coils, which are used in industries including aviation, aerospace, aircraft, chemical and defense industries (Sukumaran Nair 2020).

Urea Manufacturing

FACT in Kochi was engaged in the production of Urea. However, its Urea fertilizer plant was abandoned in 2002 and the caprolactam plant has not been operating for over a decade. At the same time, India has been importing around 90 lakh MT of urea every year mostly from China and Oman. India is, in fact, one of the largest importers of urea fertilizer worldwide.

The Central government has announced plans to revive five fertilizer (ammonia and urea) manufacturing plants in the public sector, which had been closed down during the 2000-2002 period (citing, at that time, the relatively high cost of production in these units). These are the plants of Fertilizer Corporation of India (FCIL) and Hindustan Fertilizer Corporation Ltd (HFCL) at Talcher (Odisha), Ramagundam (Andhra Pradesh), Gorakhpur (Uttar Pradesh), Sindri (Jharkhand) and Barauni (Bihar). The government expects that the revival of urea production will reduce the country's dependence on imports from China. FACT's plant at Ambalamedu (Kochi) had a capacity of producing 3.3 lakh tonnes of urea per annum when it was closed down in 2002. FACT has approached Government of India with a proposal for a new Urea plant. If this proposal receives approval, FACT's Urea plant, which will have access to natural gas as feedstock, will emerge as a major Urea producer with relatively low investment and low cost of

production.⁸ FACT will then be able to meet the Urea requirements for agriculture in several south Indian States.

Cement Manufacturing

There is a large market for cement within Kerala. However, more than 90 per cent of Kerala's current demand for cement is met by cement procured from other States. Cement produced in Tamil Nadu and Andhra Pradesh supply nearly 70 per cent and 20 per cent respectively of the Kerala market (for cement). As of now, the major Kerala-based cement manufacturer (Malabar Cements) has a share of only around 6 to 8 per cent of the market for cement within the State. Cement manufacturing units in Kerala should make use of the large market for cement from within the State.

III. Electronics

Kerala was one of the first Indian States to recognize the importance of electronics manufacturing when the State government set up Keltron in 1973. Despite its early start, Kerala lags behind some other Indian States, notably Tamil Nadu and Karnataka, in electronic hardware manufacturing. At the same time, the growth of the electronics industry in India, at the national level, has also been far below the country's potential in this sector. While Kerala has been more successful in the IT industry than in electronics hardware manufacturing, it is not yet a leading State in terms of IT revenues. At the same time, industry sources say that the nature of software development in the State and the skill levels of its IT workers provide Kerala some niche advantages.

Given such a context, Kerala should think of ways to revive manufacturing of electronic and IT hardware in the State. First, the market for electronic and IT goods in Kerala is relatively large and sophisticated. The State government itself is a large consumer of electronic and IT hardware products. Secondly, Kerala should build on the unique advantages of the IT sector in the State and also make good use of the skill sets of its IT workforce. Globally, there is now a growing integration between the IT and electronic sectors and between software and hardware production. With IT sector itself going through fundamental changes, it is important that Kerala turn its attention to diversifying into hardware manufacturing as well.

Thirdly, large numbers of engineers and professionals from Kerala work in advanced areas of electronic design and manufacturing in many parts of the world. The State can encourage some of them to return and start enterprises in Kerala. Some of these non-resident Keralites can act as mentors to technology start-ups from the State, providing technology, expertise and financial assistance to young entrepreneurs.

⁸ To set up a modern Urea plant in Ambalamedu, with an annual production capacity of 12.7 lakh tonnes (2200 tonnes per day of ammonia and 3850 tonnes per day of urea), investment required will be of the order of approximately Rs. 4500 crores.

IV. Medical Equipment, Healthcare and Biotechnology

With respect to research and manufacturing in the area of medical devices, Kerala already possesses some expertise and key advantages, including the presence of a few leading research centres, availability of skilled workers, and favourable natural environment. Combining these advantages with the State's strengths in the IT sector, Kerala can emerge as a significant player in the medical devices sector. Kerala should devise strategies to nurture entrepreneurs capable of setting up high technology firms in the health sector across the State. Given the critical importance of the medical devices sector on the one hand, and the large dependence in the country now on imported medical devices, Kerala can contribute significantly to the national efforts to build technological and manufacturing capabilities in this sector.

In the medium to long run, Kerala could become a leading centre of research and high-end manufacturing in the areas of diagnostics, biotechnology and pharmaceuticals, as well as of medical devices. In addition to the existence of some leading research institutions and the availability of skilled labour, one of Kerala's key strengths in the above-referred areas is the State's health infrastructure itself. The wide network of hospitals, health professionals and patients (who are educated and health conscious) across Kerala provide an enabling environment, including a rich source of data, for researchers in all fields relating to health. The State should particularly encourage startups and high technology SMEs in research and high-end manufacturing in these areas.

Biotechnology offers the potential for the development of a range of value-added products in Kerala, especially given the State's rich natural diversity. Kerala has a number of academic and research institutions in the areas of biotechnology and life sciences, which are considered as among the best in the country. These institutions have created a critical mass of human resources, which is an important asset for Kerala in the biotechnology and life sciences industries.

V. Anchor Industries: Industrial Corridor, Ports, Shipping, Logistics, and Inland Water Transport System

Kerala has taken steps to implement the high-tech industrial corridor project connecting Kochi and Palakkad. Kochi-Palakkad Hi-Tech Industrial Corridor will be part of the Chennai-Bengaluru Industrial Corridor Project. The corridor is expected to stimulate large investments in the areas of high technology manufacturing, agro-processing, IT, biotechnology, and life sciences. After its full implementation, the Corridor Project will be one of the key centres for Kerala's industrial growth.

International experience suggests that there are important possibilities for industrial growth based around ports. Singapore provides a good example. The advantages offered by the Singapore port provided the momentum to that city-state's emergence in later years as an international hub for shipping, logistics and distribution, and communication and information.

With the setting up of the Vizhinjam port, the Kerala coast will have two major ports (Vallarpadam in Kochi is the other major port) and a number of minor and intermediate ports.

Given such a context, the study aims to understand the potential for the growth of various industries in Kerala, mainly around the Vizhinjam and Vallarpadam ports.

Costs related to transport and logistics form a substantial chunk of the overall costs in chemicals, minerals and related industries in Kerala. In fact, in the case of cement manufacturing units in Kerala, transport-related costs account for almost 70 per cent of the overall costs.

An effective inland water transport system can go a long way in reducing costs associated with the transport of cement and heavy chemicals in Kerala.

In Kerala, an inland water transport system will be preferred over road transport with respect to the safety aspect too. Transporting over dimensional consignments (ODCs), which carry large equipment or heavy chemicals, through Kerala's crowded roads is a highly risky affair.

VI. Textile and Garments

There is a large market for cloth in Kerala. At the same time, however, employment creation in Kerala within the textiles and garment sectors is rather limited. There is large potential for an expansion of enterprises and workers in the textiles, garments, and related industries in Kerala.

There are 20 textile mills in Kerala in the public or cooperative sectors (7 of these mills are State public sector units while the remaining 13 are in the cooperative sector), which together employ approximately 5000 workers. There are also a few major private sector groups in the textile-spinning sector in Kerala. There include the mills run by the Patodia Group in Aluva (GTN) and by Pricot in Kanjikode, Palakkad.

However, the textile sector in Kerala has been going through a difficult phase, with almost all of the mills in the public and cooperative sectors registering losses.

A revival of the textile and garment sectors in Kerala has been one of the important agendas of the State Government.

According to the 2011-12 NSSO survey, there were a total of 1.7 lakh workers in Kerala in the textile industry, which also included workers in the coir industry. At the same time, the garment industry in Kerala provided employment to 3.3 lakh workers, which also included employment in small, tailoring establishments. The textile and the garment industries together provided employment to 5 lakh workers in Kerala, which accounted for 27.6 % of the total manufacturing employment in the State (of 18.1 lakh) in 2011-12 (see Table 5; also see Thomas 2020).

The major centres of textile production in India are located in Tamil Nadu and Gujarat, and these States provided employment for 16.8 lakh and 10.5 lakh textile workers respectively in 2011-12. There were 5.7 lakh textile workers in Maharashtra. A majority of the textile workers across the country are engaged in small, unregistered firms, working with powerlooms or handlooms (Thomas 2020).

In 2016-17, there were 220 factories in Kerala engaged in the spinning, weaving and finishing of textiles, and they employed a total of 14,300 textile workers. In the same years, there were 4409 factories in Tamil Nadu in the spinning, weaving and finishing of textiles, employing 3.0 lakh workers (see Thomas 2020).

As already mentioned, the garment industry provided employment to 3.3 lakh workers in Kerala in 2011-12, according to NSSO data (see Table 5). This included employment in small, tailoring establishments. But if we look at employment only in the relatively large garment factories (employing at least 10 workers), the number is much smaller. In 2016-17, there were only 44 garment factories in Kerala employing a total of 8384 workers. In comparison, there were 936 garment factories in Karnataka employing a total of 2.7 lakh factory workers. Tamil Nadu had 1315 garment factories but total factory employment in the garment sector in that State was less than in Karnataka: 1.1 lakh garment workers (all for 2016-17) (see Thomas 2020). Bangalore in Karnataka and Tiruppur in Tamil Nadu are two of the largest centres of garment production in the country.

Textile Spinning Sector in Kerala: Major Challenges

The spinning sector in Kerala faces some important challenges including: (a) relatively small size and technologically backward condition of the industry in Kerala (b) excess capacity in the spinning sector in India (c) fluctuations in raw material prices (c) competition from firms in other State and China (d) and other challenges faced by the industry.

Kerala does not produce the raw material needed for the spinning sector -- cotton or synthetics. Further, the yarn produced by the spinning mills in Kerala is processed outside the State – in textile centres such as Bhiwandi in Maharashtra. In this way, the spinning sector in Kerala is geographically isolated, with limited forward or backward integration. Most of the spinning mills in Kerala, particularly those in the public and cooperative sectors, use old machinery and outdated technologies. Technological backwardness is a factor that reduces the productivity levels of public or cooperative sector spinning mills in Kerala (Thomas 2020).

The textile industry in India began to face difficulties after 2011-12, with the general slowdown in the economy. The large capacities (in textile spinning) that were created during the boom period (2003-2008) has emerged as a major issue for the industry. One of the major challenges facing the Indian textile industry is that some of India's competitor countries, introducing Vietnam and Pakistan, face very little duties in their export markets. This is because of the Free Trade Agreements (FTAs) entered by these countries with their trading partners.

Garment Industry in Kerala: Major Challenges and Opportunities

Kerala has a large and sophisticated market for all types of garments. In addition to the large home market, garment firms in Kerala can also take advantage of the demand for Kerala-specific designs from a sizeable export market comprising non-resident Keralites.

Compared to the spinning and weaving sectors, value addition is much higher in the garment sector. Compared to the spinning and weaving sectors, capital requirements are low in the garment sector. Therefore, there is greater scope for entrepreneurship in the garment industry. At the same time, however, relatively small players in the garment sector face stiff competition from the bigger firms. For instance, in the case of the undergarment manufacturing industry, big brands such as Jockey command dominance because of their large volumes of production and their financial and marketing strengths (Thomas 2020).

Kerala's potential in the garment industry emerge partly from the changing nature of the garment industry worldwide. Globally, the trend in the market is towards 'fast fashion models' in garments. This has reduced the lead-time, that is, the time between the initiation and completion of a production process. This implies that more than scale, flexibility and skill are going to become important in determining success in the garment industry. In such a context, Kerala's garment manufacturers will have an advantage because of the relatively large home and export market they can leverage (Chinju Johny 2020).

The other advantage is the large availability in Kerala of skilled workers and professionals in the garment and fashion sector. The industry should work closely with fashion and design institutes in Kerala. The garment sector should take good advantage of online marketing strategies. The State government should play the role of a facilitator in triggering the growth of the garment sector in the private sector. Special attention should be devoted to the nurturing of woman entrepreneurs.

VII. Handloom and Powerloom Sectors in Kerala

The handloom and powerloom industry provide employment to a sizeable section of the workforce in Kerala. As already noted, there were 1.7 lakh workers in the textile industry in Kerala in 2011-12 (including workers in the coir industry). It is likely that 90% of these workers are in the informal sector, which include workers engaged in handlooms and powerlooms.

The handloom and powerloom industries in Kerala are characterized by low levels of productivity and poor conditions of work. According to persons associated with a handloom cooperative society in Kalliassery, Kannur, a worker engaged in handloom weaving is able to weave only 5 to 6 metres of cloth in a day. A worker is able to earn only around Rs.350-400 a day (although a worker's total earnings in a day, including the benefits such as PF she receives would amount to Rs.645) (Thomas 2020).

While a handloom worker is able to produce only 5 to 6 metres of cloth in a day, a worker in the newly set up high-tech weaving factory in Pinarayi (in Kannur) can oversee the production of upto 450 metres of cloth in a day.⁹ Compared to handlooms, productivity levels are much higher even in powerlooms.

⁹ Based on the author's field research in Kannur, Kerala (2019).

Working conditions are very poor for workers engaged in handlooms and powerlooms (noise levels are particularly high in powerlooms). Cooperative societies should be able to provide toilet and other facilities, especially for women workers engaged in these industries.

It is clear that in handlooms and other traditional sectors, both technological and organizational innovations are needed to increase productivity, improve wages, and at the same time, avoid job losses. The promotion of handlooms should be done along with measures for improvement of value added per worker.

Handlooms should be encouraged to work on products/areas where it can create a niche market (such as high design furnishings or sarees). Handloom cooperatives should work with design institutions such as National Institute of Fashion Technology (NIFT) so that they can come up with innovative designs and marketing strategies. Another option would be a tie up between handloom weaving societies and the tourism sector (Thomas 2020).

The State government has engaged handloom cooperative societies in Kerala to supply cloth for the School Uniform Scheme of the Government. Handloom workers and leaders of cooperative societies have agreed that the School Uniform Scheme has helped to revive the sector to some extent. The Government is planning to extend the School Uniform Scheme to cover a greater number of students in the State. A demand from powerloom cooperative societies has been that they should also be allowed to benefit from the scheme.

VIII. Other Traditional Industries

Cashew Industry

The cashew industry in Kerala has been facing a severe crisis from 2013-14 onwards. In 2018, according to industry observers, the crisis affected more than 80% of the 834 registered cashew factories in Kerala, and close to 20% of all cashew factories had been burdened with stressed assets (as declared by banks from which these factories had taken loans) (Thomas 2020).

According to some estimates, the cashew industry in Kerala employs as many as 2 lakh workers, mostly women. The public sector units in the cashew industry – Kerala State Cashew Development Corporation and CAPEX – together employ approximately 16,000 workers. The rest of the cashew workers (that is, approximately 90% of the cashew workers) are engaged in cashew factories in the private sector. Therefore, the crisis that has affected private-sector cashew factories has rendered several women workers jobless.

A major reason for the problems facing small- and medium-scale cashew factories has been the fluctuations in the price of raw cashew nut (RCN), which affect the working capital requirements in the industry. In recent years, the price of raw cashew nut has risen to as high as 2400 dollars per ton. The rise in international prices of raw cashew nut along with the depreciation of the Indian Rupee (against the dollar) meant that the working capital requirements in the industry have soared to very high levels. The cashew processing industry was particularly affected by a

rise in the import duties (to 9.7%) on raw cashew nut imposed during 2014-15 (the import duties have now been reduced to 2.5%).

A field study carried out in 2018 found that a cashew-factory owner employing 100 workers requires approximately 1.2 tons of raw cashew nut on a daily basis. When the raw cashew nut prices increased to 2400 dollars per ton and the Rupee-dollar exchange rate depreciated to Rs.70 per dollar (as it happened in some months in 2018), such a factory required working capital of approximately Rs. 2 lakh per day. Assuming that the factory operates for 200 days, the annual working capital requirement for such a factory would be approximately Rs. 4 crores a year (Thomas 2020).

Banks had been providing large working capital loans to cashew factories in Kollam, especially during periods when the industry was generating profits. Typically banks have been giving loans to cashew factories with houses or land owned by the factory-owner as collateral. However, many of the cashew factories have started incurring losses as the prices of raw cashew nut began to climb upwards from 2013-14 onwards. At the same time, there has also been a general decline in the export demand for cashew, especially from developed countries (Thomas 2020).

The cashew industry in Kerala continues to employ traditional technologies for cashew processing. In fact, the industry in Kerala believes that the handcrafted (drum roasting technique) cashew processed in Kollam has a distinctive flavor and this provides them a unique marketing advantage. At the same time, the cost of processing of cashew in Kerala is higher than the costs in other Indian States and in Vietnam, partly on account of the traditional nature of production technique employed in Kerala.

Coir Processing

One of the important challenges faced by coir industry in Kerala is the shortage of raw material, namely coconut husk, which is processed into coir fibre and coir products. There has been a general stagnation in coconut cultivation in Kerala in recent years. There have also been other constraints to the collection and processing of coconut husk in Kerala. They include the relatively small size of land holdings in which coconut is cultivated in the State and environmental issues involved in processing of husk.

At the same time, the neighbouring State of Tamil Nadu has distinct advantages compared to Kerala with respect to the availability of raw material. Pollachi in Tamil Nadu has emerged as a major centre for the coir industry. In fact, there are several units in Tamil Nadu, which make use of coir pith, which is a byproduct in the conversion of coir husk into coir fibre. Coir pith is extensively used for agriculture and poultry farming in Tamil Nadu. Tamil Nadu and China (for coir mattresses) have made major advances in coir processing.

Modernizing the Traditional Sectors

The government is taking steps to modernize the traditional industries in the State, including coir, cashew and handloom. As already noted, these industries continue to employ a substantial

part of the State's total workforce. Modernization of traditional industries will include (but will not be limited to) mechanization of production processes in these industries. Moreover, with modernization, Kerala's traditional industries will strive to diversify into new products (such as geo-textiles in the coir sector), and evolve effective marketing and distribution strategies. Rather than displacing workers (a strategy involving mechanization alone may result in this), modernization will lead to overall expansion of the industry and the creation of greater value addition per worker.

The State Government has taken several steps to modernize the coir sector. The initiatives include plans for technology-enabled procurement and decentralized fiber extraction. The procurement process will be carried out by Kudumbasree units/farmer producer companies, making use of mobile based aggregated procurement platform. For the traditional spinning and weaving sector, the strategy involves the building of linkages with eco-tourism projects (which highlight the history of coir). At the same time, industrial spinning and weaving sectors will be modernized.

For achieving a brighter future, the coir industry in Kerala has to venture into new products and innovative marketing strategies. Already the State Government has encouraged diversification into industrial coir with a focus on non-woven, coir geo textiles, coir composite/ injection molded coir and coir composite board. Given coir's properties such as tensile strength, it has applications in sectors such as automobiles and aerospace. The coir sector requires entrepreneurs who can take advantage of the research in the area of coir and related material.

IX. Knowledge Economy Clusters in Thiruvananthapuram, Kochi and Kozhikode-Kannur

Thiruvananthapuram has the potential to emerge as one of the most dynamic centres of knowledge economy within the country, with a distinctive advantage in biotechnology and life sciences. The premier academic and research institutions in Thiruvananthapuram include the Rajiv Gandhi Center for Biotechnology (RGCB), Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST) and Indian Institute of Science Education and Research (IISER).

Kerala State Industrial Development Corporation (KSIDC) has set up a Life Sciences Park in Thiruvananthapuram. Within the Life Sciences Park, the Institute of Advanced Virology has started operations in 2019. A facility for the manufacture of medical equipment is also being set up within the Life Sciences Park.

Kochi and its surrounding areas also offer exciting potential for the growth of biotechnology. Cochin University of Science and Technology (CUSAT) and Mahatma Gandhi University (in Kottayam) carry out research in this field. Kerala State Drugs and Pharmaceuticals (KSDP) Limited has pharmaceutical production facilities in Alappuzha. Kerala is planning to set up a Pharma Park in Kochi, which will be developed along with the Petrochemical Park, both of which are being set up adjacent to BPCL-KRL (Kochi Refinery Limited). Pharma Park in Kochi could provide space for firms that are engaged in research and high-end manufacturing in the areas of pharmaceuticals and biotechnology.

A third cluster of biotechnology and life sciences industries could be developed in the northern part of Kerala, which will take advantage of the academic and research institutions as well as the rich biodiversity in this region, including Kozhikode, Kannur and Wayanad. Both Kozhikode and Kannur have international airports, and they can benefit, in particular, from their relative proximity to Bangalore (firms in high technology areas considering a shift out of an overcrowded Bangalore may consider setting up their bases in these cities).

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Part 3: Industrial Policy and Agencies for Transformation

I. Industrial Policy: The Need for a Sharper Vision

Industrial policy and agencies for economic transformation are both important factors while charting a new path for industrial growth in Kerala. Industrial policy for Kerala should recognize the State's unique challenges and opportunities. As the Approach Paper for the Thirteenth Five Year Plan points out, Kerala as a region is *not* suited for industrial units that require vast tracts of land, industries that degrade environment, or industries that are based solely on cheap and unskilled labour. At the same time, as the Approach Paper argues, Kerala should aim to set up a modern industrial sector that builds on the distinctive advantages of the State's rich natural resources and skilled workers.

Kerala's future industrial growth should be based increasingly on private enterprise. In fact, there is enormous potential for saving mobilization and entrepreneurship within the State. Kerala's distinctive advantages include workers and entrepreneurs in the State who are educated, with many of them professionally qualified and having exposure to new technologies and the wider world. Given the nature of capital and entrepreneurship within the State and given also the unique conditions of its geography and natural environment, industrial growth in Kerala could be led by small and medium enterprises -- enterprises that are innovative and high value adding.

It needs to be emphasized that Kerala's future economic growth should be led increasingly by knowledge-based, high technology, and innovative industries and sectors. Kerala should have a plan to harness the latest advances in areas such as biotechnology, life sciences, nanotechnology, and material research for the State's future economic growth. At the same time, Kerala should also try to transform its traditional industries, including handloom, coir and cashew, making use of new technologies, especially in design and marketing. With a population of close to 35 million (in 2012), which has one of the highest levels of per capita consumption in the country, Kerala is a large market for a range of new-technology products, including electronics, IT, and health-related products.

While Kerala's future industrial growth may be led by the private sector, public sector institutions, especially public sector units (PSUs) under the State government, will play an important facilitating role. There are 103 State PSUs in Kerala, which include 42 PSUs under the Industries Department. State and Central PSUs in Kerala possess enormous resources, which include the expertise of their staff, access to advanced technologies including machinery and testing facilities, as well as ownership of land and buildings in prime locations across the State.

State public sector units in Kerala could become the prime movers for a range of public-private partnerships in advanced technologies across the State. State PSUs could provide incubator facilities for startups and small and medium enterprises. They can set up research centres and training facilities to nurture high technology entrepreneurship.

Consider, for instance, Keltron. Keltron has production facilities in several locations across Kerala. Keltron could set up a research centre in advanced electronics, which may encourage

researchers and professionals in the area of electronics to associate with the public sector unit. It is possible that many professionals who are non-resident Keralites may be keen to work in Kerala on a visiting fellowship or other arrangements. Keltron could encourage some of these researchers or a selected number of young engineers to set up startups, making use of its incubator facilities. This could set the stage for transforming Keltron into a major facilitator for entrepreneurship in advanced electronics.

One of the important means to promote innovative industries is through the building of strong linkages among three institutions: universities or academic institutions, industry, and the government. The long-term foundations built in the State in the areas of health and education provides a launching pad for the State in knowledge-intensive industries. Universities and academic institutions in Kerala should be encouraged to work in cutting edge areas of technology and also to work closely with industry. Students and faculty members should be encouraged to set up startups and high technology enterprises. The potential for university-industry-government linkages are the highest in sectors such as life sciences, biotechnology and advanced electronics.

The State government has already implemented a number of reform measures to ease the process of setting up an enterprise in Kerala. They have been aimed to reduce the delays faced by a prospective entrepreneur in getting permissions from the relevant authorities, getting land allotted to set up the factory, and obtaining permits for construction and electricity connection. The State has also achieved much progress in making the process of finding information and obtaining permissions online.

At the same time, it is important to recognize that industrial policy for Kerala should not be about competing with other Indian States in 'Ease of Doing Business.' The 'Ease of Doing Business' ranking, which is mainly based on a methodology recommended by the World Bank, attach importance to the cheapness of land and labour. Given its relative shortage of land and semi-skilled labour, Kerala may find it difficult to compete with many other Indian States in attracting labour-intensive or resource-intensive industries. Instead, industrial policy in Kerala should focus more clearly on encouraging enterprises that are based on innovation, new technologies and entrepreneurship.

II. Industrial Promotion Agencies

A number of governmental or public-sector agencies are involved in the promotion of private industrial units in Kerala. They include the Department of Industries and Commerce (DIC), Government of Kerala, Small Industries Development Corporation (SIDCO), Kerala State Industrial Development Corporation (KSIDC), and Kerala Industrial Infrastructure Development Corporation (KINFRA).

The above-referred agencies in Kerala should understand that industrial promotion policies for startups and high technology enterprises are not the same as the policies needed for promoting conventional industries. The agencies should try to reinvent and adapt themselves to the changing demands of industrial promotion. KSIDC could consider the possibility of providing

venture capital to new enterprises. KINFRA and KSIDC could consider ways to reduce the initial cost to borne by the entrepreneur on account of land and buildings.

There is some degree of overlap between the promotional functions and policies of these various agencies. A number of agencies are involved in the development and allotment of land needed for industrial growth. They include DIC, SIDCO, KSIDC and KINFRA. Of these, while the DIC aims to promote and allot land for micro and small industrial units, KSIDC is mandated to aid the growth of medium and large industrial units. At the same time, there are substantial differences in the policies for land allocation of the various agencies, and the cost of renting/purchasing industrial land from them.

There is need for building greater synergies between the activities of the various promotional agencies. There are, for instance, entrepreneur development schemes overseen by DIC and KSIDC. There is much to gain by achieving greater coordination between the activities of the various agencies in each of these cases.

The revival of agriculture and agro-processing industries in Kerala will require coordinated efforts from various quarters, including the State Government Departments of agriculture, industry, and tourism, local self-governments, research institutions, NGOs, health and nutrition professionals, and the media. In fact, the State Government could launch a major campaign for the building of a strong agro and food production sector in Kerala – similar to the earlier campaigns for mass literacy and democratic decentralization.

III. Institutions for Technology Acquisition and Continued Innovations

There are many potential entrepreneurs in Kerala (including migrant returnees from the Gulf countries) who are seeking opportunities to set up industries, including agro-based industries, in the State. However, a major hurdle for an entrepreneur planning to set up an agro- or food-based industrial unit is that she does not have enough information about or access to the relevant technologies (relating to products, processes and machinery). A good example is the case of *Neera* processing units, which have been set up in recent years in many places in the State. The private entrepreneurs or cooperative societies that set up these units made fairly large investments (amounting to rupees one crore or more) and often purchased state-of-the art machinery (in most cases imported). However, many of them lacked the technological knowledge and professional skills (relating to product, processes and markets) needed to succeed in such an industry, and some of them said they were even unable to get proper repair and maintenance services for their machinery (Thomas 2020).

The food and agro-based industries is a sector in which MNCs and large Indian corporates occupy a commandeering market position. This creates difficulties for small and medium enterprises to compete with the bigger firms.

The State government should consider setting up institutions that support entrepreneurs with acquisition and learning of technologies.

The State needs to evolve multiple strategies to access technologies in the chemicals and petrochemical sector, especially in the new and emerging areas (such as biochemicals). There should be efforts to promote interaction between industry and universities or academic and research institutions in Kerala. Industry-academia collaborations are likely to be more important in the areas of biochemical and biotechnology. In several areas of chemicals and petrochemicals, Kerala-based firms could consider entering into joint ventures with leading firms in the respective fields or purchasing technologies from them.

IV. Local Governments

Local governments have played an important role in industrial development in many parts of the world, notably China. Local governments can contribute effectively to the development of industries in rural areas, and in particular to industries such as food processing and garments.

In Kerala, local governments can potentially emerge as the main pillar for rural industrialization in the State. There are two reasons for such an optimism. First, local governments in Kerala have been empowered – both politically and in terms of financial resources allocated for them – to a greater extent than in other parts of India. At the same time, however, local governments in Kerala have only had limited success in the sphere of industrial development.

Secondly, as the Approach Paper to the Thirteenth Five-Year Plan of Government of Kerala notes, there is large scope in the State for the development of industrial units that are relatively small (with respect to the requirements of land and capital), and yet could be characterized as ‘smart’ (making effective use of advanced technologies). Kerala is particularly suited for the development of agro- and food-processing industries. Local governments can play an effective role in the development of these industries in Kerala.

There are two important ways in which local self-governments can intervene in industrial development: first, as a regulator and, secondly, as an agency for planning and promotion of industries. Representatives of industry associations point out that entrepreneurs face several difficulties on account of LSGIs’ rules related to industries. Entrepreneurs have to go through a long process – often taking several weeks -- to obtain licenses from the local bodies. These licenses have to be renewed after a certain period. Panchayats can cancel the licenses and issue ‘stop memos’ to the units. There have been many instances in which the licenses had been cancelled on account of even minor complaints received by the Panchayats (Thomas 2020).

At the same time, officials from LSG Department point out that they are constrained by the rules and regulations related to industry at the local level. As of now an entrepreneur has to obtain clearances from several departments including Town and Country Planning, Fire and Safety, and Pollution Control Board before they apply for license from the local government. It was felt that some of these rules and requirements are outdated and can be simplified or done away with. If the rules are simplified and local bodies are given greater powers in giving permissions to industries, the process of obtaining licenses will be much faster for the entrepreneur (she will not have to try to obtain clearances from individual departments).

According to the Panchayat Act, panchayats can issue licenses for industrial units for a period of five years. It was felt that the process of renewal of license should be made easier. The State Government has already initiated several measures to achieve greater ease of doing business in the State. As part of this, there will be changes in rules related to issue of industrial licenses by panchayats.

LSGIs Role in Promotion of Industries

LSGIs should play an active role in planning for and promoting industrial development. As of now, LSGIs allocate only around two per cent of their total fund allocation for the industrial sector. This allocation will have to go up. There is also need for an attitudinal shift: LSGIs should see themselves as enablers and facilitators for industrial growth. There should be an effective plan at local level about the appropriate nature of industrial development for each Panchayats. In fact, LSGIs have started new initiatives including 'Entrepreneurs Club' to promote entrepreneurship and industrial growth.

There should be healthy competition between local governments to facilitate industrial development in their respective Panchayats. LSGIs could be ranked in terms of their success in promoting industrial development. Often when various ward members or councillors compete to get a share of the total budget in a panchayat, it results in investments whose size and scale are less than optimal. Therefore, it is important for panchayats to have a long-term plan with respect to the nature of industrial development.

V. The Role of Industries Department

The Industries Department should play an active part in making use of the funds available with LSGIs. In fact, it should vigorously campaign to obtain a substantial share of funds for industrial development from the LSGIs. As of now, the Departments of Animal Husbandry, Dairy and Fisheries have been successful in obtaining funds from the LSGIs because of their proactive interventions. In the planning process for industrial development at the local level, Industrial Extension Officers (IEOs) of the Industries Department can play an important role. They can work closely with the LSGs to promote industrial development.

Processing of agro and food products has great potential for growth in Kerala. LSGIs should be actively involved in identifying products and in promoting entrepreneurs in these fields. They should, in particular, try to obtain assistance from technically qualified persons in the panchayat, especially young engineers.

Kudumbashree can work with LSGIs for the promotion of agro and food based industries in particular.

VI. Public Sector Units

Among Indian States, Kerala has one of the largest numbers of public sector units set up by the State government. Many of the public sector units in the State had been pioneers in India in their respective areas of operation. Travancore Cochin Chemicals (TCC) and other chemicals-based units in the Aluva-Kochi region had been important players in India's chemical industry at the time they had been set up (and at least until the 1960s). Kerala was one of the first Indian States to recognize the importance of electronics manufacturing when the State government set up Keltron in 1973. Later, Kerala was one of the first States in the country to set up an IT park when Technopark started operations in Thiruvananthapuram in 1995.

In addition to State PSUs, Kerala also has a number of Central PSUs. They include Fertilizers & Chemicals Travancore Limited (FACT) in Kochi, Kochi Refineries Limited (of Bharat Petroleum Corporation Limited (BPCL)) and Cochin Shipyard Limited (CSL) and Instrumentation Limited (IL) in Palakkad.

PSUs as Facilitators for Private Entrepreneurship

PSUs in Kerala should play the role of facilitators for the promotion of entrepreneurship, especially high-technology entrepreneurship. Chemical-based PSUs could initiate special efforts to promote downstream industries in the area of chemicals and petrochemicals. The upcoming Petrochemical Park and Pharma Park could emerge as important avenues for public-private participation. KSIDC should launch special programmes to encourage private investors to begin manufacture of downstream products in chemicals and petrochemicals. As already mentioned, there is huge potential for promoting electronics, biotechnology and other high technology sectors with assistance from State and Central public sector institutions in these fields.

Greater Autonomy for PSUs

It is felt that State PSUs in Kerala should have greater autonomy with respect to making operational and strategic decisions. State PSUs could be awarded specific ratings (based on various parameters) as it is done in the case of Central-sector PSUs (they are categorized as *maharatna*, *navaratna* and *miniratna* companies). State PSUs that obtain high ratings could be given greater autonomy and freedom in making their decisions.

It is also felt that there is need for a professional Board to oversee the activities of PSUs in Kerala. The Board should comprise professionals with expertise in technological, financial, and other managerial aspects related to each company. The members of these Boards could meet at regular intervals and offer advice and guide the management and the government on strategic issues related to PSUs.

VII. University – Industry Linkages for Technology Upgrading

In the medium to long-term, Kerala should take steps to enhance its human resource capabilities in the areas of biotechnology, life sciences and other advanced technologies. Universities in Kerala could take the initiative for this. Academic and research institutions in Kerala should try to build collaborations with leading technology institutions in India and abroad. Such

collaborations could lead to the exchange of students and faculty members, joint research projects and publications, and to a faster growth in the formation of technology firms in Kerala.

Universities and academic institutions in Kerala should be encouraged to work in cutting edge areas of technology and also to work closely with industry. Students and faculty members should be encouraged to set up startups and high technology enterprises.

CHAPTER 3.2

INFORMATION TECHNOLOGY: THE FUTURE PATH TO GROWTH

The IT sector in Kerala occupies today a significant space in the State's economy and its importance has been recognized particularly in terms of its potential and significance in the future of the State. This chapter examines some issues related to the sector.

Introduction and Overview:

Information technology (IT) is undoubtedly an integral element of the technology of the 21st century. To describe it as the cutting edge of technology, as was common in the last century, is to underestimate the extent to which it has become the equivalent of the machine in the Industrial Revolution. Just as the production of machinery was at the foundation of economic growth in general, and the growth of industry in particular, just as the advance of mechanization in the 20th century transformed production, the IT revolution has outperformed its original expectations. This is especially borne out by the manner in which the new technology is increasingly becoming the foundation of the organization of all aspects of production, circulation and distribution of goods, especially in the advanced economies.

Information technology, in contrast to mechanization, is characterised by a dual structure, commonly referred to as software and hardware. It is arguable which aspect is more dominant and likely to be so for the future, and at the current pace of development it is perhaps prudent to not draw any definitive or rigid conclusions. While both aspects have their own trajectories of development, it is also increasingly evident that they constantly interact and influence each other.

Two recent announcements, one on the use of the latest machine learning methods in the control of stratospheric balloons for internet connectivity, and the other on the use of deep neural network methods to make a breakthrough in understanding how proteins fold, demonstrate the tenuous nature of the hardware/software distinction. This dual structure is eminently reflected in the nature of the IT industry, where the global leaders among IT firms and corporations have increasingly a stake in both aspects, even if in their origins they focused on only one of them.

For developing economies, the IT revolution has posed a peculiar challenge. The relatively slow pace of mechanization, and indeed industrialization, in many developing economies appeared to imply that the new technology would have limited scope in these economies. However, in varying ways, especially in South-East and East Asia, as well as India, the significance of IT even in developing economies has been brought home sharply. India, in particular, has had a fairly unique trajectory of development of IT, where the emphasis has been much more on software than hardware. But more importantly, the development of IT in developing economies like India was driven in the first instance by an IT sector that was very much

export-oriented. However, subsequently both domestic demand in some sectors and the realisation of the importance of e-governance have given an significant boost to IT in the country. Nevertheless, the mainstay of the IT industry in India is its export orientation, with its exports continuing to lead domestic revenue by at least 3 to 1. External dependence on hardware is also significant and not diminishing in absolute terms, amounting in recent years to between a third and half of the gross export revenue.

The IT sector in Kerala presents some particular features that are important to recognize, even if there are many that are in line with the all-India picture. The latter is true in the export-oriented, and foreign market-directed nature of the industry in Kerala. The software side of the IT sector is even more heavily dominant in the State than in the rest of the country, with only a limited presence in electronics manufacturing.

Nevertheless, Kerala possesses some very significant advantages. The State has a remarkable level of mobile penetration, with 32 million households being connected. Its internet penetration through broadband and mobile is also very high, 20 percent and 15 percent respectively, and leads the country in this respect as well. According to an impact assessment report of the Digital Literacy Mission, Kerala has the highest level of digital literacy by various measures in the 14-49 age group, while it ranks very high in other age groups as well. Kerala's achievements in literacy and school education have clearly stood the State in good stead in achieving such levels of literacy, reflecting the emphasis on computer education in the school curriculum.

Another striking feature of Kerala's IT sector is the emphasis on e-governance and the large number of relevant initiatives involving all aspects of governance and all categories of stakeholders. This is in keeping with the people-centric thrust of development in the State that is periodically reinforced by the presence of democratic and progressive trends in the polity that are also able to be present in government. As a consequence, a significant part of the public sector effort in Kerala is in e-governance and related initiatives to promote digital access to the citizenry. The State has taken the lead in declaring access to the internet a basic human right, a move that also has found strong support in legal decisions. The development of digital literacy and e-governance can certainly be expected to have a multiplier effect on growth. However, this alone would hardly be sufficient for the role of IT as the engine of the next stage of development of the State.

The challenge before Kerala today is to leverage this aspect of the State's human development advance for the growth of the State's economy, especially in the IT sector. Currently, Kerala's IT footprint in the national IT sector, though very modest in absolute terms, is perhaps reasonably significant given the relative size of the State's economy. A more all-round view would suggest that there is an urgent complementary need, alongside promotion of digital literacy and e-governance, to develop the IT industrial sector. The current levels of growth are certainly promising but clearly the gaps between Kerala's potential and promise as well as the gaps between Kerala and the leading States in the IT sector need to be bridged expeditiously. Secondly, the hardware or electronics manufacturing sector is also woefully inadequate and needs urgent attention so that at least a minimal electronics manufacturing supply chain is available in the proximity of the major software centres in the State.

One very positive sign for the future is the active start-up ecosystem in the State that has been nationally recognized for its efforts. The extent to which such investment in the IT industrial sector can be regionally or spatially decentralised remains open, despite the State's commitment in recent years to a hub-and-spoke model that sought to have a more decentralised investment, that did not always live up to its promise. The positive externalities of agglomeration and clustering cannot be neglected, though an active land-use and land-acquisition policy is needed to ensure the spatial requirements of rapid and large-scale growth.

Unlike its counterparts in the rest of the country, especially Bengaluru, the IT sector in Kerala is not backed up adequately with a strong higher education and R&D system in the State with special reference to the IT sector. The triple helix configuration of industry, government and academia of the IT sector elsewhere in the country crucially misses the academic strand in Kerala. The setting of a Digital University around the IIITM-K is a welcome step, but much more needs to be done to evolve a strong R&D and higher education infrastructure in the State of high quality.

The IT sector in Kerala has undoubtedly been affected by the macro-economic headwinds that the State has had to face over the last few years. Apart from the overall stringency in resource mobilisation that States face, two successive years of floods and landslides rendered it difficult for the Government of Kerala to undertake even the normal course of investment that it devoted annually to the IT sector, though the sector suffered only a moderate direct impact due to the floods. Following on this, the body blow of the COVID-19-induced recession, both global and national, has seriously affected the sector.

Nevertheless, substantial gains in various dimensions of the IT sector have been registered under the present government. The sector has also undoubtedly benefited from the continued commitment to planning that the State has held to steadfastly under the present government. In the subsequent sections we present in detail some of the main policy features and major initiatives and developments in this sector over the period of the current 13th Five Year Plan.

Approach for 13th Five Year Plan:

The salient features envisaged in the growth of the sector under the 13th Five Year Plan were as follows:

- **Employment Creation:** - Creation of more employment opportunities through generating one lakh jobs during XIII Plan.
- **Human Resources:** - Making available trained human resources through ensuring skill development activities in all educational institutions.

- Startups: - Development of an eco-system for start-ups through the promotion of constant innovation through new start-ups, thereby developing new products and services.
- Development Missions: - Enabling IT for the management and monitoring of the activities of the Four Missions of the Government.
- Public access: - Public access to high speed digital services by providing Wi-Fi hotspots.
- Data Platform: - Integration of wide variety of data of Government departments, agencies and institutions on a single platform.

Vision

The vision of the sector was to establish Kerala as a knowledge-powered digital society by 2020 through application of digital technologies within the governing principles of freedom, inclusion, transparency, safety, and security.

Goals

Kerala State Information Technology Mission (KSITM)

- Enable a harmonized, interoperable, interconnected, and integrated government.
- World class infrastructure, integrated e-service architecture, digital citizenship.

IT parks.

- Establish Kerala as a preferred IT hub for emerging technologies

Kerala Startup Mission

- To be a leading knowledge start-up ecosystem in India.
- Creating a sustainable and inclusive ecosystem for developing knowledge-based start-ups through multiple interventions.

Indian Institute of Information Technology and Management–Kerala (IIITM–K)

To be an iconic knowledge institution focusing on emerging technologies.

- To develop as a sustainable institution with national reputation and global recognition.

International Centre for Free and Open Source Software (ICFOSS)

Leverage FOSS for enhancement of quality of life of the people through development of inclusive and assistive technologies.

Kerala State Information Technology Infrastructures Limited (KSITIL)

- Transform KSITIL into a top-class agency for development of physical and electronic Infrastructure required for IT sector.

Hardware Mission.

- Act as a single point of contact for international connects and enable growth of electronics and hardware industry in the State.

New initiatives of 13th Plan

- Skill Delivery Platform Kerala: This is one of the major initiatives taken up in the 13th Plan to help engineering colleges in the State to improve the employability skills. This platform links engineering colleges in the State with IT parks via tele-presence network connecting 150 hi-tech classrooms to deliver skills training to approximately 50,000 students in a year.
- Kerala Fibre Optic Network (KFON): The aim of the project is to build a scalable and resilient core network and create an access network to connect more than 30,000 government institutions comprising offices and educational entities and collaborate with regional service providers to provide free internet to 20 lakh economically backward households through this network. This will be provided through a new optic fibre pathway created in parallel to KSEB electric power network.

IT Policy 2017

The IT policy announced by the government in 2017 aims to generate projects which will mould Kerala into knowledge-based society. The main objective of the policy is to establish Kerala as a leading IT destination and generate direct and indirect employment opportunities in the sector, build necessary technological infrastructure for creation of an environment favourable to ICT development, enhance the necessary human capital required to both produce and use innovative technologies through education and skill building and establish Kerala as an IT industry destination by attracting investments from within and outside Kerala. The policy aims to:

- Establish Kerala as a preferred IT and ITeS hub and leverage ICT to contribute significantly to GDP and employment.

- Create schemes to attract the global IT players to the parks.
- Create 1 crore sq. feet built up space and provide 2.5 lakh employment.
- Utilize the capabilities of corporate and the capital from NRIs to develop the parks
- Maintain a steady annual growth of exports in IT and ITeS service and products.
- Create a science and technology driven ecosystem for research and development and innovation.
- Increase the quality and competitiveness of small and medium IT enterprise and connect them to the international market.
- Foster technology entrepreneurship culture and create a sustainable start up ecosystem by creating technology hubs.
- Provide inclusive, affordable and accessible electronic service delivery system for public services.
- Ensure universal open access to data, information and knowledge resources in a digital domain.
- Make the State 100 per cent e-literate and utilize ICT in all walks of life to ensure equitable and inclusive development of the society.
- Give special emphasis to promote research and development in Malayalam language computing and develop tools for the same.
- Develop a talent pool within the State in skills for sunrise industries and human resources capabilities for emerging and futuristic technologies.
- Make IIITM-K and ICFOSS as centres of excellence for research and development and studies in IT sector.
- Strengthen IT @ school.
- Create a safe framework for digital living in terms of cyber security, privacy and freedom of internet conduct training and awareness programmes and promote electronic transactions.
- Leverage IT in the day to day operations and in the delivery of services in hospitals.
- Adopt open source and open technologies in public domain and promote the same in SMEs and industry.
- Manufacturing of electronics goods/components will be made possible among all including house wives.
- Strengthen the operation of KENTON so as to regain the prominence it had in the past.
- Research and development institutions shall be established in the area of convergence of IT and bio technology and technologies shall be utilized to improve the quality of exports in fruits and vegetables, fish and spices from Kerala.
- Create an infrastructure to enable women to work in the IT sector ensuring them safe transportation and secure environment at the work place.

Performance of IT Sector in Kerala up to 2018-19

- According to the Internet and Mobile Association of India (IAMAI) report, titled 'India Internet 2019', Kerala's Internet penetration rate is the second highest in the country (54 per cent), with Delhi NCR topping the list with 69 per cent penetration. The report also notes that Kerala, Tamil Nadu and Delhi have the highest proportion of female internet users.
- Kerala is the first State to make Internet Access a Basic Right. Kerala Fibre Optic Network (K-FON) project was initiated by Government of Kerala for providing free internet connectivity to 20 lakhs economically backward households.
- The E-district Kerala, a lighthouse project in India, has touched the 4 crore mark with respect to issuing various certificates to the citizens through Akshaya Centres.

- The revamped Kerala Spatial Data Infrastructure Portal was launched in 2017 to become the first State in the country to start Geo Tagging of Government Offices. The KSDI has more than 300 beneficiaries including users from 39 Government Departments.
- Wi-Fi hotspots were established in 1,888 locations across the State, and the average unique users per day are 32,000. Per day data consumption is more than 6 TB.
- About 190 lakh sq.ft built up space, ₹4,982.1 crore investment, ₹20,623.6 crore turnover and 1,00,558 employment created through 825 companies operating in the three IT Parks.
- 2,716 Akshaya Centres are functioning across the State giving employment to 7,577 persons.
- Under the banner of Kerala Start Up Mission and several of its sector-specific partner organisations, there are presently more than 2,200 registered start-ups, more than 3.15 lakh square feet of incubation space and more than 230 Innovation and Entrepreneurship Development Cells.
- Kerala ranked as the top performing State in the Department for Promotion of Industry and Internal Trade's (DPIIT's) State Startup ranking.
- Availability of Resources for Startups is more than ₹1,000 crore through Fund Scheme.
- IIITM-K established 10 Research Centres, 65 Research papers published in National/ International Journals.
-
- ten GIS-based web application/portal projects were started for various Departments and six other projects are under development stage.
- Three Android-based GIS mobile applications have been developed and deployed.
- Various GIS based workshops for Government Departments, Schools, Universities and Colleges were conducted, in addition to provisioning of internship facility for students.

Financial Performance of IT sector from 2016-17 to 2019-20

Plan Outlay and Expenditure, (in Rs crore)

Sector	Annual Plan 2016-17			Annual Plan 2017-18			Annual Plan 2018-19			Annual Plan 2019-20		
	Outlay	Exp	(%)	Outlay	Exp	(%)	Outlay	Exp.	(%)	Outlay	Exp	(%)
IT Sector	479.38	328.10	68.44	549.3	350.1	63.7	587.6	269.1	45.8	574.38	188.04	32.74

Source: Budget

Performance of IT sector Agencies

The agencies involved in the implementation and promotion of Information Technology in the State are Kerala State Information Technology Mission (KSITM), Indian Institute of Information Technology and Management–Kerala (IIITM–K), International Centre for Free and Open Source Software (ICFOSS), Technopark, Infopark, Cyberpark, Kerala State Information Technology Infrastructures Limited (KSITIL), Kerala Start Up Mission (KSUM), IIIT- K, Pala and C-DIT.

1. Kerala State Information Technology Mission (KSITM)

Kerala State IT Mission is an autonomous nodal IT implementation agency of the Department of Information Technology, Government of Kerala which provides managerial and technical support to various initiatives of the Department. KSITM performs diverse roles including, enactment of ICT related policies, development of guidelines and standards for e-governance, ICT facilitation for the Government entities, provide end to end support and guidance to State Departments in digitisation efforts, act as a bridge between Government and industry, undertake Capacity Building initiatives and bridge the digital divide, establish and sustain common IT Infrastructure and take up various e-Governance initiatives. The focus activity is delivering the best of the digital services to the citizens keeping in mind "Citizen First" approach. As a result of these proactive policies and projects, Kerala achieved major progress in the transformational journey towards "Digital State".

Some of the remarkable achievements are shown below.

- Kerala declared as the 1st digital State in the country by GoI in 2016
- Hi-Speed Rural Broadband Network was first commissioned in India at Idukki
- First State in the country to issue over 4 crore e-Certificates.
- 100 per cent of the GramaPanchayats are connected through optical fibre network

Key activities of KSITM

Kerala has been a forerunner in e-governance and mobile governance by promoting and developing core infrastructure and e-literacy programmes.

- K-Fi/Public Wi-Fi: K-Fi is a free Wi-Fi project that aims to establish 2,000 Wi-Fi hotspots across the State to provide free internet to the citizens of the State. Out of which, Wi-Fi hotspots have been established in 1888 locations across the State and the average unique users per day are 32,000. Per day data consumption is more than 6 TB. Installation of Wi-Fi hotspots at selected coastal sites and the remaining sites are in progress.
- E-Office aims to conduct office procedures electronically thereby transforming Government offices to paperless offices and bringing out the benefits of digital communication that ultimately leads to faster decision making. E-office has been implemented in all 54 departments in Secretariat, 46 Directorates, 14 Collectorates, 12 RDOs. The Government has decided to roll out e-Office upto grass root level in Taluks and Village Offices and Panchayats in coming years. E- file movement per month is more than 8 lakh.
- Core infrastructure for e-governance in the State consists of Kerala State Wide Area Network (KSWAN), Secretariat wide Area Network (SECWAN), State Data Centre and State Service Delivery Gate way (SSDG). KSWAN is the backbone of the State Information Infrastructure (SII), connecting Thiruvananthapuram, Kochi and Kozhikode extending to 14 districts and 152 Blocks Panchayats and 63 Mini Civil Stations/ revenue towers across the State. Around 3,700 offices of Government Departments are connected to KSWAN through Wireless and a larger number through leased lines and LAN. All the Grama Panchayats of Thiruvananthapuram District are connected through the National Information Infrastructure (NII) pilot project by

integrating KSWAN with National Optical Fibre Network. Around 500 offices including Akshaya Centres were connected as part of the NII pilot project in Thiruvananthapuram. State Data Centres (SDCs) are the heart of e-governance framework of the State, hosting various applications and websites of the Government entities and provisioning associated services.

- e-District, a State Mission Mode project under Digital India, targets delivery of high volume citizen services provided by the district administration, at Taluk or Village level, through back-end computerisation to enable online availability of these services through Common Service Centres (CSC) and State portal. Some of the major services availed through e-district project are:
 - Implemented 25 Revenue Certificate Services across the State
 - RTI and Public Grievance Services
 - Online utility bill payment systems enabled in e-District portal
 - Various services of other Departments are also online/getting integrated with the e-District Portal
- M-Keralam, the unified mobile application which will bring together all the services rendered by different Government Departments under one umbrella. Currently, the app is providing 101 services of 18 Departments of the State.
- e-Government Procurement (e-GP) is being implemented in the State, 53 Government Departments and 216 PSUs/Autonomous Bodies/Government agencies are utilising the common e-Procurement system.
- Friends Janaseva Kendras have been established in all the 14 district headquarters. In 2018-19, an amount of ₹148.1 crores revenue for the Government was collected. The Government is also planning to make all services currently available through Akshaya also to be made available to Friends without service charges. It is a single window 'no queue' integrated remittance centre, where the citizens have the opportunity to pay all taxes and other dues to the Government, under one roof, at no extra cost. On an average, 1,000-1,050 people visit each centre every day.
- Akshaya is an innovative project launched on November 18, 2002 to bridge the digital divide. It works on public private participation mode. In the initial stages, the objective of the project was to make at least one person in a family e-literate. Gradually focus of Akshaya shifted to citizen service centric mode.
 - 2,716 Akshaya Centres are functioning across the State giving employment to 7,577 persons.
 - More than 1,700 Akshaya Centre act as banking Kiosks for different banks.
 - 5.5 million citizens got enrolled under UID through Akshaya Centers.

Enrolment under UID through Akshaya is 92.7 per cent against the national average of 62 per cent. Akshaya is also a premier agency in UID enrolment having generated 75 per cent of total UIDs in Kerala.

The details of Akshaya centres in Kerala

Year	No of Akshaya Centres (nos)	No of person employed (nos)	Turnover (Rs crore)
2016	2628	7476	46.1

2017	2679	7774	65.3
2018	2906	7942	73.6
2019 (as on 30.09.2019)	2716	7577	43.4

- Kerala State Spatial Data Infrastructure (KSDI) is a mechanism to provide geo-spatial data sharing at all levels of Government, the commercial sector, the non-profit sector, and academia.

The major achievements of the project are as follows.

- KSDI Geo Portal is upgraded using Erdas Apollo 2016 webserver with new features
- KSDI collected data from 20 departments with more than 400 layers in various file formats and after quality checking, uploaded 59 seamless layers.
- Presently, KSDI has more than 300 beneficiaries including users from 39 Government Departments. Government of Kerala was assigned as the State registrar for Aadhaar enrolment by UIDAI. Electronics and IT Department of Kerala was approved as the nodal Department and KSITM was approved as the nodal agency for Aadhaar enrolment in the State. In addition, UIDAI has approved KSITM as the Authentication User Agency and e-KYC User Agency. Aadhaar based services like Digilocker are also being rolled out to departments. At present, there are about 900 Permanent Enrolment Centres, 500 Child Enrolment Centres and 1,450 Update Centres by Akshaya CSCs to facilitate Aadhaar Enrolment and changes to details in Aadhaar.

Indian Institute of Information Technology and Management - Kerala (IIITM-K)

The Indian Institute of Information Technology and Management – Kerala was set up in 2000 as a premier institution of excellence in Science, Technology and Management. It emphasises quality education to students and develops professionals and leaders of high calibre imbued with values of entrepreneurship, ethics and social responsibility. The institute focuses on education, research, development and training in basic and applied information technology and management.

IIITM-K is the implementing agency for the various e-governance initiatives for Govt of Kerala and Govt. of India. It co-ordinates national and international conferences and workshops to provide opportunity to students to interact with world class experts and researchers.

There are four specialised Post Graduate Programmes (M.Sc.) being offered by the Institute in Computer Science with specialisation in Cyber Security, Machine Intelligence, Data Analytics, and Geospatial Analytics. Along with the above four specialised courses, the Institute also offers M.Phil Ecological Informatics, M.Phil Computer Science and PG Diploma in E-Governance. The M.Phil and MSc degree are awarded by Cochin University of Science and Technology (CUSAT) and post graduate diploma by Directorate of Technical Education, GoK. The Pass outs from IIITM-K hold commendable positions in internationally reputed IT companies such as JFWTC-General Electric, Accenture, Amdocs, Siemens Ernst and Young, ARS Software, Allianz Cornhill, IBM, IBS, Infosys, Tata Elxsi, Tata Consultancy Services, UST Global Technology, and Wipro.

The new campus of the Institute at Technocity is in completion phase and shall facilitate and promote studies, research and incubation in Information Technology and its application domains. The

fully completed campus would have total built up area of 48,161 sqmetre. As of now, 95 per cent of works in Academic block and hostel building are completed. It is expected that the functioning of IIITM-K will shift from Technopark to new campus in 2020.

- Technopark

Technopark was set up as an autonomous organisation fully owned by Government of Kerala to create global standard infrastructure and to provide total support required for development of high technology industries. It was formally dedicated to the Nation on November 18, 1995. Since then Technopark has been growing steadily both in size and employees strength.

With the commissioning of Phase III, Technopark will become the largest IT Park in India with 380 acres of land, 9.7million sq.ft built up area. Technopark through its companies, currently provides direct employment to 60,000 IT employees and offers an indirect employment for another 1,50,000 persons.

With the launch of Technocity project in Kazhakuttam, the largest integrated IT Township in 424 acres of land, the Kazhakuttam-Kovalam (NH 66) has become the first IT Corridor in Kerala. Technopark has charted out an ambitious target of creating 50,000 new jobs by 2021.

Physical achievements of Technopark

Particulars	Achievements 2015-16	Achievements 2016-17	Achievements 2017-18	Achievements 2018-19
Total turnover (₹crore.)	12000	12000	14000	14000
Total export (₹crore)	6250	5000	6452	7000
Total investment (₹crore)	4970	4970	4970	4979
Total Employment (Nos)	51,865	52,746	56,000	60,000
No of Companies (Nos)	390	370	400	410
Total land (Acres)	330	760	760	770.2
Total built up space (Lakh sq.ft).	72	93	97	97

Source: Technopark

Technopark currently owns 20 IT buildings within the campus. The built up space in the Technopark has increased from 72 lakh sq feet in 2015-16 to 97 lakh sq. ft in 2018-19. Out of

which Technopark has created 32.8 lakh sq.ft area for industrial modules and total built up space completed by companies is 64.2 lakh sq.ft.

Details of the major events held by IT Parks during the last 4 years are;

(i) #FUTURE 2018 - #FUTURE was the first conclave based on digital disruption conducted in Kerala. It was organized on March 22 & 23 2018 at Hotel Le-Meridien, Kochi. Roughly 1800+ attendees attended these sessions over the two days.

(ii) Global connect sessions in the US, Europe & Dubai - Many company executives - CXO level & the level below attended these events and resulted in the following multinationals engaging with Kerala either by setting up a facility or by participating in Governmental initiatives

Company	Employment in Kerala	Other Engagements
Tech Mahindra	350 odd people in Trivandrum	
Cisco		ThinQbator - Startup tinkering facility in IIITMK SmartVillage (VKC) Initiative through Kerala IT Mission
Teranet	150 people in Trivandrum	
IQVIA	300 people in Kochi	
Byjus	Office requested in Technocity. Yet to start	
E&Y Scaleup	This is an ongoing process. Approx 500+ people have been added in the last couple of years	
Wipro IIoT center	50 staff	
University of Illinois, Chicago		Tie-up with Kerala Startup Mission & ICT Academy for skilling

Existing companies like Allianz, Infosys, TCS, CTS have been engaged through these events and have been pushed to expand as well. Notable success in this is Allianz which has set up a Global Center of Excellence for Blockchain projects in Trivandrum. This provides high-end technology centered employment for about 30 professionals. Big MNC's which came to Kerala IT Parks, include Nissan Digital, Way.com, H&R Block.

- Infopark

Infopark, Kochi is the second largest IT hub in Kerala with spokes at Cherthala and Thrissur. The objective of Infopark is creation of state-of-the-art infrastructure facilities such as space for IT/ITeS companies, supply of power, water and connectivity. Since its inception in 2004, Infopark and its co-developers created over 80 lakhs sq.ft. built up space and have provided employment to over 40,000 IT Professionals through 392 IT companies who have taken space in its Parks.

Infopark has 5 campuses which is spread over 323 acres under various phases of development. In case of Infopark TBC, a built up partly fitted space of 25,845 sq.ft at Kaloor International Stadium was taken over from KSITM in the year 2013. Infopark undertook necessary balance fit outs, modifications/rectifications in the fitted out space and now the facility is mainly used for providing office space for startup companies.

Physical achievements of Infopark

Particulars	Achievements 2015-16	Achievements 2016-17	Achievements 2017-18	Achievements 2018-19
Total turnover (₹crore.)	3200	3200	4013	6606.75
Total Employment (Nos)	32800	33116	37000	40000
No of Companies (Nos)	282	298	396	392
Total land (Acres)	321.86	323	323	323
Total built up space (Million sq.ft).	6.96	6.6	8.0	9.0

Source: Infopark

• Cyberpark

Cyberpark was established in the lines of Technopark in Trivandrum and Infopark in Kochi based on a hub and spoke model. It was set up to bridge the IT infrastructure gap along the west coast starting from Kochi to Kasaragod. The objective of Cyberpark is to provide cost effective and top of the line infrastructure to the IT/ITeS investors and thereby encouraging, promoting and boosting the export of software/software services and creating employment opportunities in Malabar region. It is the responsibility of Cyberpark to interface between Government and Industry interact with potential investors, strengthening the IT/ITeS base, holding promotional campaigns, developing human resources for IT and ITeS. Kerala State IT Infrastructure Limited (KSITIL) holds the ownership of the entire area of 43 acres of land at Kozhikode Cyberpark.

The major achievements of Cyber Park are:-

- First IT Building "Sahya" (2.88 lakh sq. ft.) completed and started operation. Spaces have been allotted for 23 companies.

- Total investment of ₹3.12 crore with a total turnover of ₹16.78 crore including exports worth ₹14.95 crore.
- Twenty three companies started operation in SEZ and created around 560 direct employments.
- Cyber park in association with Internet and Mobile Association of India (IAMAI) established app incubation hub, first of its kind in Kerala.
- Twenty four Start up companies operational in Cyber Park and thereby created 127 number of IT employments.

Major Physical achievements of Cyberpark

Particulars	Achievements 2015-16	Achievements 2016-17	Achievements 2017-18	Achievements 2018-19
Total turnover (₹crore.)	3.956	6.646	10.68	16.78
Total export (₹crore)	3.956	6.646	10.68	14.95
Total investment (₹crore)	0.334	0.848	2.39	3.124
Total Employment (Nos)	55	112	266	558
No of Companies (Nos)	4	8	13	23
Total land (Acres)	166.52	42.49	43	43
Total built up space (lakh sq.ft).	2.88	2.88	3.0	3.0

Source: Cyberpark

- Kerala State IT Infrastructure Ltd (KSITIL)

KSITIL is a public limited company formed for the creation of the infrastructure for IT/ITeS in the State. The company leverages the valuable land assets owned by the Government and through viable financial models, generates funds for building the IT Infrastructure in the State in a Private Public Participation model.

The business model of the company is to acquire land and develop basic infrastructure facilities like electricity, water, road and compound wall in the area, obtain SEZ status and other such Government approvals that may be required and then allot land to private developers for development of either IT SEZ or IT parks.

Major projects of KSITIL are Kozhikode IT Park, Kannur IT Park, Kasaragod IT Park, Kollam IT Park, Koratty IT Park, Cherthala IT Park, Ambalapuzha IT Park, Infocity Pala, IIIT-Kerala and Technologies

Some of the highlighted projects of KSITIL are as follows:

1. Skill Delivery Project, Kerala: SDPK is a prestigious project assigned to KSITIL by Government of Kerala. The objective of the project is to bridge the gap between students and industry. SDPK consists of a virtual platform with teleconferencing system being installed in all the 150 engineering colleges and 3 studios, which are being setup as part of the project. As part of the project GoK is setting up Hi-Tech classroom with a minimum seating capacity of 60 students.
 2. Kerala Fibre Optic Network (KFON): KFON, a State-wide optical fibre network capable of providing Hi-speed connectivity to all Government and educational institutions, offer free internet to 20 lakh economically backward families and subsidised internet for others by leveraging KFON Infrastructure. It shall act as the perfect platform for the State to pioneer in IoT and other emerging technologies like artificial intelligence, and block chain and give impetus to innovation and entrepreneurship.
- International Centre for Free and Open Source Software (ICFOSS)

Government of Kerala established ICFOSS as an international centre in collaboration with Free Software Organisations in India and abroad to promote development and application of free software and free knowledge. It is a nodal agency in all matters relating to free and open source software including consultancy, research and development, academics, studies and service, training, publishing, certification, international co-operation and collaboration. ICFOSS has carried out so many FOSS-based Training programmes, Workshops, Seminars, Research Programmes, Projects, Malayalam Computing activities, Student Internships and projects, Summer Camps, Faculty Development Programmes, and Fellowship programmes.

The major activities of ICFOSS are the following:

- 20 faculty development programmes for teachers in which 600 teachers participated, 25 student training programmes in which 750 students participated, 6 training programmes for Professionals and SMEs in which 200 persons participated, 10 Scilab training programmes in which 300 students and teachers participated, Student project works, Internships, and Fellowship programmes are conducted.
 - Launched Assistive Technology products such as T- Slide Mouse, Flip-Mouse and on- Screen Malayalam Keyboard
 - FOSS cell co-ordinators meet up has been conducted and 45 co-ordinators attended.
 - Training to Government Employees on FOSS Solutions and Malayalam Computing in 62 batches and 1700 employees participated
 - International conference Swathanthra 2017 in which 300 students and professionals participated
- Kerala Startup Mission (KSUM)

Kerala Startup Mission (KSUM) is the nodal agency of Government of Kerala for implementing the entrepreneurship development and incubation activities in the State. Kerala Start up Mission, formerly known as 'Technopark Technology Business Incubator' is India's first successful non academic business incubator. It started operations in 2007.

The objective of the Mission is to identify and develop entrepreneurial talents among youth and students in Kerala, address the technology based entrepreneurship development requirements in the traditional sectors of Kerala, build appropriate training programmes suitable for Kerala's socio-economic culture, identify market niche for technology products and services, interfacing and networking among academic, R and D institutions, industries and financial institutions, establishing a platform for speedy commercialisation of the technologies developed in the institutes to reach the end-users.

Under the banner of KSUM and several of its sector-specific partner organisations, there are presently more than 2,200 registered start-ups, more than 3.2 lakh sq.ft. of incubation space, more than 230 Innovation and Entrepreneurship Development Cells (IEDC), all of which are evenly distributed across various districts and cities such as Kochi, Trivandrum and Calicut. Many of these facilities also house advanced labs that focus on sectors such as hardware, biotechnology, electronics and advanced computing.

Since 2016, number of start ups are 2200, employment generated are 20400 numbers and funding disclosed was Rs 1064 crore. Out of 2200 startups, 13 per cent were registered in the first three quarters in 2019 alone.

In January 2019, KSUM launched the Integrated Start up Complex in Kochi, a sprawling complex, spread over 1.80 lakh sq.ft with dedicated facilities for various tech sectors. It also hosts (1) Maker Village –India's largest electronic hardware incubator and ESDM facility

- (2) Bionest – State of the art biotechnology instrumentation platform to promote and develop new entrepreneurs
- (3) BRING – India's first international accelerator for hardware start-ups
- (4) BRIC – an incubator dedicated to developing solutions for cancer diagnosis and care
- (5) Centre of Excellence established by UNITY and CERA

KSUM has collaborations with government, PSUs and corporates to enable and empower startups and youth with opportunities in the tech industry and the digital economy.

Major Events

Huddle India is the focal point for startups and tech talent as well as top-tier investors, executives and media. The conference features stage programmes, side-events such as networking sessions, roundtable discussions and facilitated workshops to help startups connect with the right investors and corporates. The philosophy behind Huddle India is to help the next-generation world-conquering startups come forward and succeed. Huddle primarily focuses on emerging sectors such as blockchain, cryptocurrency, IoT, gaming and esports, cybersecurity, digital entertainment, AR/VR, AI, UI/UX and eGovernance.

Seeding Kerala - It's a two-day investor-focussed event.

Meetup Café is the place for startups, industries, institutions and investors to come together, share their knowledge and develop a community whose focus is the overall development of the ecosystem. The café is developed as a mentorship and investment centre for startups across the state, as well as a one-stop center for all technology awareness. Meetup Cafe is hosted every month in the three cities of Kerala namely Trivandrum , Kochi and Calicut.

Investor café is an opportunity for startups looking for funds to connect with investors and get funded.

Women Startup Summit is an KSUM initiative to encourage aspiring women professionals to take up the entrepreneurial journey and develop an inclusive entrepreneurship ecosystem in Kerala.

BOX

Among the many achievements of Kerala Startup Mission are

- Kerala ranked as the top performing State in DPIIT's State Startup ranking.
- Home to one of India's largest innovation hub of 1.8 lakh sq.ft - the Integrated Startup Complex
- Established centers of excellence in AR/VR with global tech giant Unity
- Established the BRINC Hardware Accelerator and XR Accelerator in collaboration with Unity
- Incubation infrastructure for niche sectors such as cancer research, spacetech, biotech
- Established Space Technology Application Development Ecosystem (STADE)
- Establishing Super Fab Lab at Kochi
- Conducted 32 fab workshops imparting digital fabrication expertise to more than 250 participants.
- 47 funded Startups in the State, out of which 13 are funded in 2019.
- 316 start ups build through IEDCs.
- More than 40 incubators and 4 accelerators in the State.
- 13 per cent Women Startups in Kerala, 30 Women Startups registered with KSUM

9. Centre for Development of Imaging Technology (C-DIT)

C-DIT has been functioning as an Information and Communication Technologies (ICT) solutions provider in the Government sector.

The major programmes undertaken by C-DIT are:

- Reorganisation of Chief Minister's Public Grievance Redressal system and Distress Relief Fund assistance mechanism into an integrated online portal www.cmo.kerala.gov.in
- Design and development of software for conducting online examination and on screen evaluation of written answer sheets for Kerala Public Service Commission
- Digitisation of old manuscripts and documents for State Archives and Registration departments
- Design, hosting and maintenance of over 200 Government websites and social media platforms MIS/ERP systems for various Government departments

- In the wake of the recent flood disaster in the State, C-DIT maintains the online fund collection portal for State Government which is developed and deployed last year during flood disaster in the State.

10. Institute of Information Technology – Kerala, Pala (IIIT-K, Pala)

Government of Kerala started IIIT-K, Pala, Kottayam District in 2015-16 under PPP mode to lead, organise and conduct research and innovation in IT and allied fields of knowledge. This is a joint initiative between Government of India, Government of Kerala and Industrial Partners with 50 per cent, 35 per cent, and 15 per cent share participation. The approved project cost is ₹128 crore excluding land.

Way Forward

To stay competitive as an IT destination, the IT sector in Kerala must significantly enhance the value addition it brings to the State economy. It must attract investment in emerging areas in the IT sector and not rely solely on established IT/ITES activities. As the Indian IT sector as a whole grapples with issues of the changing focus and emerging issues within the global IT sector, Kerala must also keep pace with these changes. At the same time, the considerable advances that have been made in the digital empowerment of the population and the spread of IT awareness and use must continue to be built upon and developed with further investment in appropriate infrastructure. These would continue to serve the State's needs over a period of time and prevent obsolescence.

Education-enabled ICT, research and development and innovations need to be identified and promoted to strengthen the State's economy. It is expected that the thrust placed by the Government in infrastructure development, human resource development and overall economic development would open up more and more for the meaningful use of Information Technology. Our leap forward in IT related areas is dependent on attracting substantial investment in this sector and identifying and promoting young entrepreneurs through start-ups.

Conclusion

Even though Kerala has achieved good progress in creating infrastructure for the IT sector and generated employment opportunities during the last five year plans, the State lags behind in creating research and development infrastructure for establishing a knowledge economy. In the coming years, the State needs to focus on developing competitive advantages in new avenues of IT. For this ICT-enabled education, research and development and innovations in the sector needs to be identified and promoted to strengthen the State economy. Moreover, the thrust of government in infrastructure development, human resource development and overall economic development will open up large opportunities for the meaningful use of Information Technology.

CHAPTER 3.3

LEVERAGING SCIENCE AND TECHNOLOGY FOR DEVELOPMENT

In this chapter we examine the current scenario of science and technology in Kerala and the future development of this sector as part of the larger effort at Kerala's development. This is particularly relevant in the circumstances in which Kerala finds itself today in facing the challenge of sustainable development. Indeed, as we near the end of the 13th Five Year Plan, the significance of the science and technology sector is perhaps even more evident and relevant than it was initially.

Introduction and Overview:

It is a truism that science and technology are critical to development. However, like all truisms about development, achieving it in practice does not follow in any automatic fashion. At the national level, the recognition of the importance of science and technology as part of the effort at development came early on. This has stood the country in good stead and provided it with the basic scientific and technological infrastructure that by the seventies of the last century had placed India among the leading S&T nations in the developing world, and provided some hope of a bright future and a competitive scientific infrastructure by even developed country standards. Unfortunately, it may be argued that these hopes and aspirations still remain substantially in the future rather than having been realized in practical terms.

The reasons for this gap between hopes and their realization are not difficult to track down. It may be argued that Indian S&T increasingly presents the picture of an inverted pyramid with a substantially advanced infrastructure that rests on a fairly weak base. While the public sector institutions constitute a major part of the nation's S&T assets, the private sector has not developed such institutions or a corresponding S&T infrastructure, except in a very few select areas. These include pharmaceuticals (India's vaccine production capacities have been noted world-wide in the COVID-19 pandemic), some chemicals and to a certain extent electronics and software. In these areas too, creativity and innovation are arguably weak, even if production capacities exist. Overall, India's footprint in global patenting is very limited.

If technology research remains limited in scope and scale in the country, basic scientific research remains restricted in practice to a few institutions, even if they are of very high quality and the best of them truly world-class. In contrast, research in the higher education sector is overall fairly limited and questions may be raised as to its quality. In a larger sense, the decline in public investment in higher education has also further exacerbated the contrast between the best of India's basic science and the relatively low level of the major part of science teaching and research in the higher education sector.

Kerala however presents a somewhat different picture. In contrast to most of the country, the State can justifiably boast of a school education sector that is not only comprehensive and universal in its coverage, but also set on a path of ever increasing quality. Even more pertinently, Kerala's civil society is highly invested in science popularisation and the promotion of a scientific temper, on a scale that has no parallel in the country. But despite these two striking features,

Kerala per se has only a limited footprint in the S&T sector in the country. Some part of this is undoubtedly due to the limited Central investment in S&T institutions in the State, with many of them focused on application-oriented research rather than in fundamental science. This has begun to change somewhat in more recent times. One must not forget though that there is a Kerala diaspora, a substantial section of it trained at least up to undergraduate level in Kerala, that is increasingly successful in competitive entry into scientific institutions in the country and outside.

While no individual State government can match the scale of Central investment that is essential to drive regional S&T development, Kerala has one of the more active and well-organised State level departments of science and technology. It has a well-established network of institutions devoted to some scientific issues that are relevant to Kerala's ecological setting, a good connect with the higher education sector and definite areas of expertise, though in a limited range. While these are laudable they are still some distance from the kind of integration of S&T that is necessary for leveraging development in the future.

One area of success in this regard though is the role that Kerala's R&D institutions played recently in assisting the State in dealing with the natural disasters of two consecutive years in 2017 and 2018. The study led by the KCSTE on the flood and landslides in the State, their causes and potential mitigation, is a landmark one that demonstrated the kind of specific contribution that these institutions could make to the sustainable development of the State.

We list below a few issues, that, inter alia, need to be examined in the context of leveraging S&T for development.

The first is the role of technology research and its relation to actual production. Two areas relevant in this respect are information and biotechnology. Unfortunately neither of the two sectors can boast of an adequate linkage between research and production. Especially in the latter, there is productive activity driven by extraction from natural resources that are of low technology levels and low value addition. Though some effort has been made to link these with research and development these are yet to bear substantial fruit. In the former the gap between capacities in the technological higher education sector and what industry demands are of course considerable.

A second issue, that has been much discussed earlier, is of quality. While it should not be exaggerated, the need is really to ensure institutional mechanisms for quality rather than mere exhortations. A third serious concern is the need to maintain adequate and strong linkages with leading institutions outside Kerala. Currently institutions do maintain some links, these are often dependent on individual contacts and are limited in number. Institutional level linkages are at another level and developing these is a challenge. One outcome of such linkages is to bring into the Kerala S&T system scientists and researchers from outside the State. Elsewhere in the country it cannot be missed that institutions with a cosmopolitan culture, drawing talent from across the country, are among the most successful. Locations like Kolkata, that were in the lead in science earlier, but had not developed such a culture have indeed fallen behind.

It must be recognized of course that much of the above cannot be driven solely by State-level finance, as these are too meagre for the task at hand and will remain so for some time to come. Hence attracting Central investment, or external higher education investment that is in tune with the State's needs are important avenues for growth of S&T in Kerala. At the same time, prudent deployment of State resources where it can have the maximum impact without duplication is essential.

In what follows the developments in the S&T sector in the 13th Five Year Plan are sketched in some detail, though some of the lesson drawn from it have already been noted above. In line with the some of the issues discussed above, two notable successes have been the consolidation of the work of the Kerala School of Mathematics and its launching a new phase of growth and the other the establishment of the Institute of Advanced Virology that is clearly a timely and noteworthy investment especially in the context of the issues raised by the COVID19 pandemic.

Science and Technology in the 13th FYP

The projects for the 13th FYP were planned for the promotion, support and popularisation of S&T and for the implementation of focused research programmes for the overall growth and development of the Kerala. It was proposed to encourage high quality research to take the state to a higher level in research. Introduction of schemes on nanotechnology and biotechnology for addressing various state related issues like pollution, waste management and better life care were also envisaged for the plan period. The approach towards the science and technology development in the current plan was focused on the real developmental needs of Kerala. The approach of funding to individual projects in the random order, of course on some general major theme, was to be replaced by funding to integrated collaborative and multidisciplinary science and technology research by bringing all the R&D centres to specific goals. The overall focus was on science, technology and innovation for sustainable development and inclusive growth in the socio-cultural economic context of the state.

Key Features of Approach to 13th Plan

- Science & Technology Investment at the State level must improve the capacity of the State Government to attract investment, develop local resources and facilitate innovations
- State efforts should complement rather than substitute Central support for the Science & Technology sector
- It is essential to ensure an adequate system of peer review, project evaluation and timely delivery for research projects, research grants and fellowships granted by Kerala State Council for Science, Technology & Environment (KSCSTE)

- Promoting coordination and collaboration between research institutions and higher education system
- Support to improve participation of women, Schedule Caste and Schedule Tribes in science and technology for a diverse and inclusive human resource base for science and technology

Vision

The 13th plan envisaged to implement programmes to achieve excellence in S&T within the state and to provide service to the society at large. The overall plan focuses on Science, Technology and Innovation for sustainable development and inclusive growth in the socio cultural and economic context of the state.

Mission

Delivery of science and technology led solutions for improving the quality of life of the people and the environment being the thrust, the plan is framed in conformity to this vision.

Public investment in science and technology sector in Kerala has been focusing on generating new income and employment opportunities in the State. The two major institutions in the Science and Technology sector in the State are the Kerala State Council for Science, Technology and Environment (KSCSTE) and the Regional Cancer Centre (RCC), Thiruvananthapuram.

Kerala State Council for Science, Technology and Environment (KSCSTE)

The main objective of KSCSTE is to plan and formulate science, technology and innovation policy pertaining to the development of the State. The council promotes and activates programmes for increasing the stock of knowledge in science, and fine tunes policies which are significant and for the sustained development of humanity. It also drives the research and development efforts of the R&D Centres and offers assistance for the creation of physical infrastructure and procurement of scientific infrastructure through the development and selective augmentation of R&D activities. The other initiatives include

- Science popularisation programmes
- Research development programmes
- Ecology and environment related programmes
- Awards and recognition for science promotion
- Technology development and transfer
- School level promotional activities

New initiatives suggested in the 13th plan

- Green Technology Initiatives – programmes on green technology are proposed to be undertaken through inter-institutional collaborations with CSIR-NIIST, CTCRI, Universities and the R&D Institutions of KSCSTE
- Preparation of database of Women in Science in Kerala – programme to analyse the representation of women in various sectors of S&T to address the concerns on under representation in any of the S&T sectors. Online Base-line data on women in science will be collected through an online directory and analysed to arrive at the present status of women in various sectors of science profession which will help to address the concerns on their under representation in any of the sectors.
- New programme to support the research and development on assistive technology
- Institute of Virology, Kerala - for strengthening epidemic preparedness, rapid response and risk communication to the public apart from the high end research in the area of basic as well s translational virology. It is proposed to have the bio safety measures in the institute to handle high risk viruses.
- R&D activities in areas of green energy harvesting, natural resource development and management, recirculation aquaculture, waste management and technology options for livelihood support
- Green Technology initiatives for making all activities of KSCSTE to be environmentally sustainable

Physical Achievement up to 2019

The plan allocation to KSCSTE under Science & Technology component is made under the following schemes:

- i. R& D Institutions under KSCSTE
- ii. Infrastructure Strengthening of KSCSTE
- iii. Schemes and Programmes of KSCSTE
- iv. Grant-in-aid support to S&T Institutions
- v. Biotechnology Development Programme
- vi. Special Programmes of KSCSTE
- vii. Karamana River Scientific Management Project

During the current five year plan period the following new schemes were initiated

viii. Institute of Advanced Virology(IAV)

ix. Institute of Diabetic Research

R&D Institutions

There are seven R&D centres under the Council which conducts research and development activities in specific mandated domains.

Overall Performance of R&D centres

PhDs	42
Man power trained (Research)	1255
Man power trained (Technical)	986
Patents filed	5
Technology Transferred	3
Research Papers	59
Trainings	37
Publications in Refereed Journals	60
Book/ chapters	11

Major initiatives /achievements of the centres are detailed below:

Kerala Forest Research Institute

- The Bamboo Primary Processing Centre (BPPC) was set up under the Bamboo Technical Support Group with the support of the National Bamboo Mission (NMB).
- A database of forestry literature developed under the project titled 'An Information System for Forest of Kerala'. This database consists of 6200 records which include scanned books, reports, and journal articles, working plans, management plans and thesis. Scanned materials are processed and metadata is provided for each record.
- Bibliographical citations of 9600 articles related to Indian Forestry has covered.
- Developed a digital library for the Teak Museum

- Conducted district level survey for studying factors affecting roosting ecology of birds in Kerala
- The Central Instrumentation Unit of KFRI generated an income of Rs.2.7 lakh

National Transportation Planning and Research Centre (NATPAC)

- Prepared GIS-based road and traffic database for the roads in the State.
- Air Pollution Index of the State was developed.
- Developed a traffic growth rate model for national highways in the State.
- Conducted study on the impact of duration of flooding on different layers of flexible pavements of flood prone roads in Kerala.
- Prepared regional transportation development plan for various districts in the State.
- Conducted study on the effect of vehicle type in the saturation flow at signalised intersections.
- About 13 road safety projects/programmes pertaining to schools, panchayats, drivers and other road users were completed reaching a target more than 3000 road users.
- Carried out 28 research projects and 34 externally funded projects.
- Devised a system for emergency vehicle priority for the operation of ambulances
- Prepared reports on investigation of major accident spots, causative analysis and mitigation measures.
- Prepared GIS-based information system for water ways in Kerala
- Prepared database pertaining to road accidents, pavement management system, traveller/tourist information system for Kerala in GIS pattern
- Completed study on failure of roads in Kuttanad region.

Centre for Water Resources Development and Management

- CWRDM has prepared Water Security Plan for 13 Grama Panchayats for Jananidhi Project- Phase II in Malappuram, Kozhikode & Kasaragod Districts.
- Prepared Hydrological Information System for the River Basins in Kerala.
- Water quality testing and issuance of Water Card is being done routinely based on request from Panchayats/Municipalities/Corporations/other public bodies.

- Assessed Water, Sanitation and Hygiene (WASH) facilities in Attappady block under UNICEF Project.
- Coordinated the preparation of District Irrigation Plans for Palakkad and Idukki districts under Pradhan Mantri Krishi Sinchai Yojana (PMKSY).
- Developed Irrigation Schedule for Coconut and Pepper for different agro- ecological zones.
- Prepared preliminary investigation report for Mitigation Measures for Flood Abatement in upper Kuttanad.
- Completed study on analysis of climatic parameters in Kozhikode.
- Identified community based water supply schemes in different local bodies with the objective of evaluation of impact of such schemes in the State.
- Developed regional flood frequency model using L moments with the purpose of regionalising the river basins of the state and developing flood frequency relations for each region.

Jawaharlal Nehru Tropical Botanic Garden and Research Institute

- Ethnomedical survey and systematic documentation of Traditional Knowledge among 13 tribal communities in 17 Grama Panchayaths of 3 districts of Kerala State were completed.
- Ethnobotanical survey in the coastal areas of three southern districts of Kerala has been completed, based on which 3069 information were documented including food plants (422), medicine (2117), fodder (132), fishing tools & implements (281), fuel (117) etc.
- An integrated R&D centre of JNTBGRI, for promoting green industry established at Kuzhoor, Panchayath, Kodungallur, Thrissur District, with the financial support of Kerala State Industrial Development Corporation (KSIDC) , Govt. of Kerala.
- Completed Ethno botanical survey in the coastal areas of selected panchayats in Thrissur for the systematic documentation of ethno-medico botanically important plant species used for food and medicine by different tribal communities in the district.
- Community Agro Biotech Resource Centre of JNTBGRI conducted training programme for 300 rural women on medicinal plant cultivation and production of value added

products from locally available plant resources with the objective of disseminating appropriate technologies to rural population for economic upliftment and income generation.

Kerala School of Mathematics

KSoM imparted training to Maths Olympiads and maths talent search, organised summer/refresher trainings and orientation programmes to college teachers and conducted national/international workshops & seminars. Conducted 29 training programmes/workshops. It has now initiated, with recognition from the University of Calicut, an integrated Masters/PhD programme. It is also expanding its post-doctoral research programme. KSoM conducted a very successful international mathematics conference that was widely attended and attracted large viewership.

Srinivasa Ramanujan Institute for Basic Sciences (SRIBS)

The institute has organised colloquia, seminars; workshops benefitting students, teachers and researchers in various areas of science. Academic programmes were conducted in which there were about 50 participants across the State every year.

Malabar Botanical Garden and Institute of Plant Sciences (MBGIPS)

- The United Nations University –Institute for Advanced Studies (UNU-IAS), the academic and research arm of the UN, recognised MBGIPS as the Regional Centre of Experts (RCE) in sustainable education.
- Number of publications-32
- Trainings conducted -10

(B) Schemes and Programmes of KSCSTE

The schemes and programmes of the Council are aimed at the development of high quality science education system in the State. With a view to identify and implement programmes to

achieve excellence in S&T within the state and to provide service to the society at large, the Council is implementing various schemes and programmes focusing science popularisation and promotion, research and development, ecology and environment, technology development and transfer, biotechnology development, school level promotional activities and science programmes for women.

Overall Achievement of Schemes and Programmes

Scheme/Programme	Projects Sanctioned	Ph.Ds	Publications			Trainings	Patents Filed
			Refereed Journals	Books/ Book Chapters	Conference/ Seminars		
HR Development in S&T							
Science Research Scheme(SRS)	133	10	558		487	166	18
Emeritus Scientist Scheme	17	23	546	9	70		3
Students Projects	417						
Scheme for Promotion of Young Talents in Science (SPYTis)	581						
KSCSTE Research Fellowship		55	197		64		
Post Doctoral Fellowship	38		25	3	66		
22 best paper/poster awards were given in conferences under SRS							
Infrastructure Development in S&T							
Selective Augmentation of Research and Development (SARD)	62 science post graduate laboratories / research institutions and 179 govt/aided schools in the State were augmented. Published 31 papers						
Sastraposhini	17 Govt schools and 4 model residential schools were selected for establishing model science laboratories						
Technology Development & Transfer							
Engineering Technology Programme	Sanctioned projects-19, PhDs-19						
Technology Development and Adaptation Programme	Sanctioned Projects-11						
Rural Technology Programmme	Sanctioned Projects-18						

Patent Information Centre	Patent Application Processed-105						
Support to Women in Science							
Back to Lab Research Fellowship Programme	25	14	48				1
Awareness Programme on “Technological advances in transforming women's lives”	Sanctioned Projects-7 600 to 700 women participants had benefited from the programme on technological advances in sectors such as energy management in household, food and nutrition, soil and water conservation, organic farming etc.						
Project on Preparation of database of 'Women in Science in Kerala'.	2,918 registrations were made in the online directory which is developed for obtaining base-line data on the status of women in various sectors of Science in the State.						
STARS (Students with Talent and Aptitude for Research in Science)							
Pratibha Scholarship Scheme	Lunched new online portal for receiving application for the scholarship No.of scholarships-357						
SPEED (Student Programme for Excellence in Experimental Design) In 2018-19, a five day residential science camp for Prathibha scholars was organised at Indian Institute of Science Education & Research (IISER) under SPEED (Student Programme for Excellence in Experimental Design)							
Kerala Young Scientists Awards were given to three scientists in 2018-19							

Key Initiative of KSCSTE :

BOX

Institute of Advanced Virology

The Institute of Advanced Virology is a significant milestone in Kerala's efforts to embrace world class science research and development. It was established in 2019 in the Bio 360 Life Sciences Park, Thonnakkal, Trivandrum by the Government of Kerala is envisioned as an institute of global standards networking Global Virology Institutes with most modern laboratories focusing research, diagnosis and management of emerging and re-emerging infectious viral diseases. Its vision is to harness the best and eliminate the worst of viruses for a better human life and to work as a centre of excellence in collaboration with international institutions for training and education in the context of research covering basic science and translational research, providing sufficient scientific inputs to enable the prevention and control of viral infections. Its mission is to develop state-of-the-art infrastructure, skilled scientific & technical personnel, and services & products in virology to serve local, national and global needs. The institute with a total project cost of ₹202.00 crore is aimed to work for industrial transfer/facilitation of technology and Kerala State Industrial Development Corporation will be

a partner in providing land and infrastructure. The construction of campus at Thonnakkal, Thiruvananthapuram, spread over 25 acres of land is in two phases, Phase I and Phase II consisting of Phase 1 A Prefab building (25,000 sq.ft.) of 2 floors housing Administrative block, Bio labs, Common Instrumentation room, Bio-safety level facilities and Diagnostic facilities and Phase IB main building (78,000 sq.ft.) of 3 floors with Administrative block, Bio labs, Bio safety level facilities and functional division. As on September 30, 2019, civil construction of Phase I A building has been completed and Phase I B is in progress.

REGIONAL CANCER CENTRE

Regional Cancer Centre, Thiruvananthapuram (RCC), is an autonomous scientific institution sponsored jointly by the Government of Kerala and Government of India. The centre was established in the year 1980 as a tertiary referral centre for the diagnosis and treatment of cancer. RCC rated amongst the top three of the 28 Regional Cancer Centres in the country. It is the only comprehensive, dedicated centre for diagnosis, treatment and control of cancer in Kerala. On an average 60,000 new patients occur every year in the state and out of this nearly one third comes to RCC for treatment. The Centre undertakes basic, translational and clinical research and disseminates the knowledge.

13th Plan

Vision –The vision of RCC in the 13th plan will be emerging as a global leader in cancer control.

Mission

- Deliver highest quality cancer care at affordable cost
- Create cancer awareness among public and health professionals
- Generate trained manpower in cancer control
- Organise outreach programmes in cancer control
- Conduct focused cancer research relevant to society
- Lead cancer control activities in the state

Targets and strategies for the 13th plan

- Construction of a 14 storey building
- Creation of infrastructure facilities and procurement of machinery and equipment in the new building

- Implementation of the Centrally Sponsored Scheme Upgradation of RCC as State Cancer Institute
- Augmentation of facilities for early detection of cancers
- Upgradation of training and research facilities for maintaining high standards in training and research

Profile of RCC at a glance(2016-17 to 2018-19)

New Cases Registered	48325
Review Cases Registered	741996
In-patient Admissions	34680
Radiotherapy	21283
Brachytherapy	500
Surgical Procedures	18566
Endoscopic Procedures	7257
Chemotherapy Administered	33917
Bone Marrow Transplantations	114
Cancer Detection Programmes	1360
Cancer Education Programmes	790
Ongoing Research Projects	480

Central and State Government Schemes

Both Central and State Governments have initiated various schemes to ensure free or subsidised treatment for cancer patients.

Central and State Government schemes

Scheme	Patients enrolled (new cases)			Total no. of people benefited			Amount spent (in crore)		
	2016-17	2017-	2018-	2016-17	2017-	2018	2016-17	2017-	2018-

		18	19		18	-19		18	19
Central Government Schemes									
Prime Minister's Relief Fund	204	220	432	953	2054	2074	1.80	1.94	3.44
Health Minister's Rashtriya Arogya Nidhi (RAN)	505			2053	15	18	2.63	0.18	
Health Minister's Discretionary Fund		1	1	15	238	1428	0.004 2	0.01	.0011
Indian Cancer Society	26	4	4	202	37	81	0.35	0.78	1.63
Health Minister's Cancer Patient Fund (HMCFP- CSR Scheme)		36	6					0.25	0.44
State Government Schemes									
Cancer Suraksha Scheme	541	542	472	4390	4928	5389	6.02	6.7	5.78
Chis Plus	5232	6017	7635	27210	33159	4078 9	14.16	16.87	19.55
Karunya Benevolent Fund	4179	4425	6162	17349	21664	2768 6	29.29	32.36	41.59
Sukrutham	2585	2270	175	6043	8310	8489	16.54	17.92	2.07
Thalolam	13	8	8	83	91	99	0.004	0.03	0.33
Scheduled Tribe Patient Fund	24	27	23	305	330	354	0.244	0.19	0.19
Snehasanthwanam for Endosulfan Victims	3	8	10	37	44	53	0.004	0.01	0.07
Total	13312	13595	14996	58460	72026	8656 5	71.16	77.23	73.20

Major Initiatives of RCC

In addition to the Government supported schemes, RCC provides support to patients and families through various other schemes as detailed below:

1. Free Drug Bank – The Free Drug Bank functions according to specific guidelines and is monitored by a committee constituted by the Director, RCC. The drug bank provided full or partial help to 999 patients upto 2019.
2. Free Food ('Akshayapathram') – Free food was provided to 20423 patients belonging to vulnerable socio-economic groups with the support of many philanthropic organisations.
3. Support for Paediatric patients – 'Prathyasa', a voluntary group working in collaboration with paediatric oncology division gives financial and psychosocial support to children and their families.
4. Indian Cancer Society Support Scheme – RCC was selected as one of the five cancer centres across India for receiving financial support from the Indian Cancer Society for treatment of cancer. 476 patients received support through the scheme.

Human Resource Development

1. International School of Colposcopy – 65 doctors were given one-week hands on training and 101 BSc (MLT) students and 21 nurses were given one day orientation programme on low cost Cervical Screening Strategies such as pap smear VIA, VILI and Colposcopy.
2. ii) Trainer-Trainee Programmes – A total number of 10816 people were trained in 2018-19 through trainer-trainee programmes conducted for health care providers which included doctors, post graduate medical students and paramedical staff from governmental and non-governmental institutions, Community Volunteers like NSS and ASHA workers, NCC Cadets, Jail Warders etc. Out of the total people trained, more than 50 per cent were community volunteers.
3. House Surgeon's Training Programme – A total number of 104 house surgeons participated in the training programme for House Surgeons of Government Medical College and Government Dental College, Thiruvananthapuram on cancer prevention and control.

Cancer Control Activities

Early cancer detection

A total number of 9807 persons attended the early cancer detection clinic of RCC. As a result, 1321 cancers and 2145 pre-cancers were detected.

Cancer Outreach Programmes

A total number of 213 cancer detection camps were conducted in various parts of the State in which 25167 people underwent screening. A total number of 14711 trainees were sensitised in cancer control through 113 cancer awareness programmes.

Apart from these, 22 camps were conducted as part of the bi-weekly cervical cancer detection clinic for the women residing at Mangalapuram in Thiruvananthapuram and of the 140 women screened, 1 cervical cancer and 6 cervical pre cancers were detected. 74 tobacco users attended the Clinic for Tobacco Cessation. Programmes on substance abuse threat in Model Residential Schools in Kerala, cancer prevention among vulnerable groups in tribal settlement colonies and cancer detection camps were arranged with the support of Scheduled Tribes Department as part of the cancer prevention and control activities in 6 Panchayatsof tribal areas of Thiruvananthapuram.

Research and Development Activities

The RCC as a pioneer research institution in cancer research has produced several Ph.Ds in cancer research. Upto 2019, around 85 scholars were pursuing Ph.D., 99 residents undertook specialization in medical, paediatric and surgical oncology super specialty courses and 141 residents undertook postgraduate courses in Anaesthesia, Pathology, Radio diagnosis and Radiotherapy in the centre. The number of on-going research projects is 480.

Infrastructure Development in RCC

i. Expansion of Physical infrastructure

The preliminary works of the construction of a state of the art building of 14 floors with 2.75 lakh sq. Feet built up area hosting radiotherapy block, new Blood Bank, 10-bed Bone Marrow Transplant Unit, Modular Operation Theatres, 8-bed Nuclear Medicine Ward, Robotic Surgery Unit, Advanced Microbiology Laboratory, ICUs, Surgical and Medical Wards, Pay wards and hostels costing ₹18722 lakh has been started by RCC in a phased manner with the target of improved space for patient care facilities.

- ii. Diagnostic & Treatment Facilities Added During the Period 2018-19
- Three anaesthesia workstations and four ICU ventilators
 - Integrated Bipolar & Ultrasonic Cutting & Coagulation Units
 - Digital Radiography and Fluoroscopy system
 - Supersonic USG machine with Elastography
 - Fourier-Transform Infrared Spectrometer

RCC: Challenges Ahead

1. Completion of 14 storied Building in RCC
2. Create more space by expansion of Physical Infrastructure
3. Virtualization of IT hardware infrastructure
4. Hyper converged IT infrastructure
5. Tobacco related cancers in Kerala state are still high. Scale up tobacco control measures to reduce the burden of tobacco related cancers in collaboration with various departments in the state.
6. Training of doctors and nurses in State Health Services Department - The intention is based on the fact that more than 60% of common cancers occurring in the community are diagnosed in advanced stages. To counter this it is essential to give prime importance for early cancer detection for which doctors of primary and community health centres have a major role to play.

Outlay and Expenditure of Science and Technology Sector

Year	Outlay	Expenditure
2016-17	159.15	86.01 (54.08 %)
2017-18	175.07	82.00 (46.84 %)
2018-19	194.08	90.59(47%)
2019-20	225.18	65.36(29%)

Source: Plan Space Kerala

CHAPTER 3.4

TOURISM IN KERALA

Tourism is regarded globally as a sector that has high economic value, because it creates employment, generates foreign exchange, spurs regional development and promotes traditional industries. International tourist arrivals across the world grew four per cent to reach 1.5 billion in 2019. Tourism is the third largest export sector in the world, accounting for 7% of global trade. The Tourism value chain extends across several verticals and industries, involving lodging, travel, transportation, food industry, retail trade and entertainment sectors. Because of its extensive backward and forward linkages, tourism also plays a major part in local economic development. The sector is also important in developing economies because of its emphasis on small businesses and the potential for generating local employment and livelihoods, particularly for youth and women.

TOURISM IN INDIA

The growing influence of the tourism sector as an economic powerhouse and its potential as a tool for development have been recognised at the national level. The Government of India has devised schemes that aim to harness the direct and multiplier effects of tourism on employment and poverty eradication in the country. It has been estimated through the Satellite Tourism Accounts framework that Tourism contributes 5.06% to the GDP of the country, of which 2.63% is direct and 2.43% is indirect. The role of the government in tourism development has been re-defined from that of a regulator to that of a catalyst involving synergy and convergence with different stakeholders. Improving tourism infrastructure, easing of the visa regime, assurance of quality standards in services of tourism service providers, projection of the country as a round-the-year destination, and promoting sustainable tourism are some of the policy areas which have been identified in order to increase and facilitate tourism in India. One of the notable initiatives taken up by Government of India in recent years is the introduction of a facilitative visa regime, extending the e-visa facility to a majority of countries, thereby making it easier for visitors to travel to India. During 2019, a total of 2.93 million foreign tourists arrived on e-Tourist visa, registering a growth of 23.6%.

TOURISM IN KERALA

In Kerala, the tourism industry is characterized by strong branding, consistent growth, diverse products and a strong presence of local entrepreneurs. Tourism has been a significant contributor to the State's economy for the last three decades, bringing in revenues of Rs 45,019

crores in 2019 and providing employment to approximately 1.5 million people, directly and indirectly. The State Government has identified the sector as one of the most significant growth areas, which can contribute substantially to the State economy. Within its constraints, the State has invested in the tourism sector, developing basic amenities in tourism destinations, investing in creating tourism products and experiences, providing information and facilitation centres, providing visitor facilities and building infrastructure for land and water-based tourism activities. Although there has been State investment in the creation of accommodation facilities, there has been a decrease in investment in such infrastructure over the years, in the light of substantial private investment in building hotels and resorts. Another major area of investment for the State has been marketing and promotion, in national and international markets. The State machinery is involved in quality assurance and certification programmes, defining service standards and conducting approval and accreditation programmes.

The growth trajectory of Kerala as a tourism destination is peculiar, considering the fact that the State does not have the notable heritage tourism assets that characterize most popular destinations such as Delhi, Rajasthan or Uttar Pradesh. Although the State is a relative latecomer in the sector, it has managed to carve a niche in the national and international arenas. The destinations of the State showcase the rich natural beauty in a variety of settings, ranging from its beaches and backwaters to mountain landscapes. Most importantly, the State has managed to attract visitors capitalizing on its human resources potential, drawing on its image as a friendly, safe destination, and opening its doors to guests. Another feature that has attracted tourists to the State is the character of its accommodation facilities, featuring local and small-scale options that provide a personal and intimate experience.

Approach During the 13th Plan Period

After the boom period of the 1990s and early 2000s, the rate of growth of tourism arrivals declined in Kerala. Tourism, however, has continuing and promising potential in the State. There is the vast and relatively unexploited tourist potential of the northern parts of the State. Backwater-based tourism is presently confined around the Alappuzha region, and there are several picturesque areas in other regions that are conducive to the development of tourism. Similarly, in its effort to attract new segments of travelers, the State has to broaden its offerings to include active/adventure tourism, special interest groups and visitors interested in niche experiences.

Tourism development requires technical expertise and all-round planning. It must cater to all sections of tourists, ranging from luxury tourism through lower-income family tourists to backpackers. During the 13th Plan period, the Government aimed to put in place a new growth strategy for tourism in the State, with ambitious targets of doubling the number of foreign tourists, increasing domestic tourist arrivals by 50 per cent, and creating around 400,000 jobs in the sector over the Plan period.

There is an anomalous situation on the State: public spending on infrastructure and destination development is far greater than investments in marketing and promotion. The department sought to correct this imbalance by aiming to raise the share for tourism promotion to at least one-third of the total allocation. In order to realise the full potential of the State, the policy was to explore and utilise all available tourism resources, natural and cultural. This would involve the development of non-traditional tourism destinations and products, thus extending tourism geographically across all regions, and throughout the year. Significant investments were planned to develop heritage resources that were hitherto under-exploited, and to promote international cultural events such as the Kochi-Muziris Biennale.

In view of the capacity of the sector to absorb skilled manpower, the State also planned to expand operations in developing human resources needed for the sector, preparing youth with the skill-sets required to deliver high-quality services. The initiative aimed not only to upgrade human resources for domestic service providers in the State, but also to prepare young people for employment in the tourism sector in other parts of India and the rest of the world. Although there has been continuous increase in private investment in the sector, the Plan laid emphasis on substantially increasing the number of places providing quality accommodation in the State, aiming to double the number of classified rooms and to add one thousand units of homestays. A thrust area identified for special attention was the development of properties and activities in northern Kerala, which was lagging behind other regions in terms of arrivals. In addition, special attention was to be paid to develop the potential for activity and adventure tourism in the State, which has a rich resource base of natural forest. This involves the identification and development of new trekking routes, camping sites, and adventure tourism centres, all of which was to be done in collaboration with the Forest department.

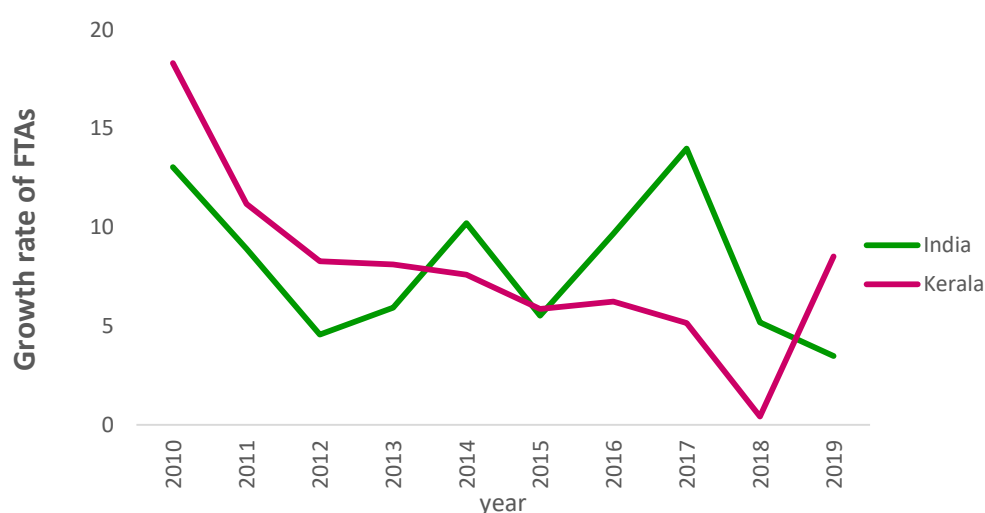
On the marketing front, efforts had to be taken to refresh the Kerala tourism brand, infusing more appealing campaigns catering to the diverse segments of visitors. There would be focus on

the cultural products and experiences, such as the Kochi-Muziris Biennale and the Muziris, Alappuzha and Thalassery heritage circuits.

Tourist Arrivals

In Kerala, the tourism sector rebounded strongly in 2019 after the 2018 floods and 2019 witnessed the highest growth rate in domestic and foreign tourist arrivals in the last 24 years. There was 8.52 per cent growth in foreign tourist arrivals and 17.81 per cent growth in domestic tourist arrivals in 2019 over 2018 in the State. Figure 1 reveals the trends in the arrival of foreign tourists in India and Kerala during the period 2010 - 2019.

Figure 1 *Annual growth rates in foreign tourist arrivals (FTAs) in India and Kerala from 2010 to 2019, in per cent*



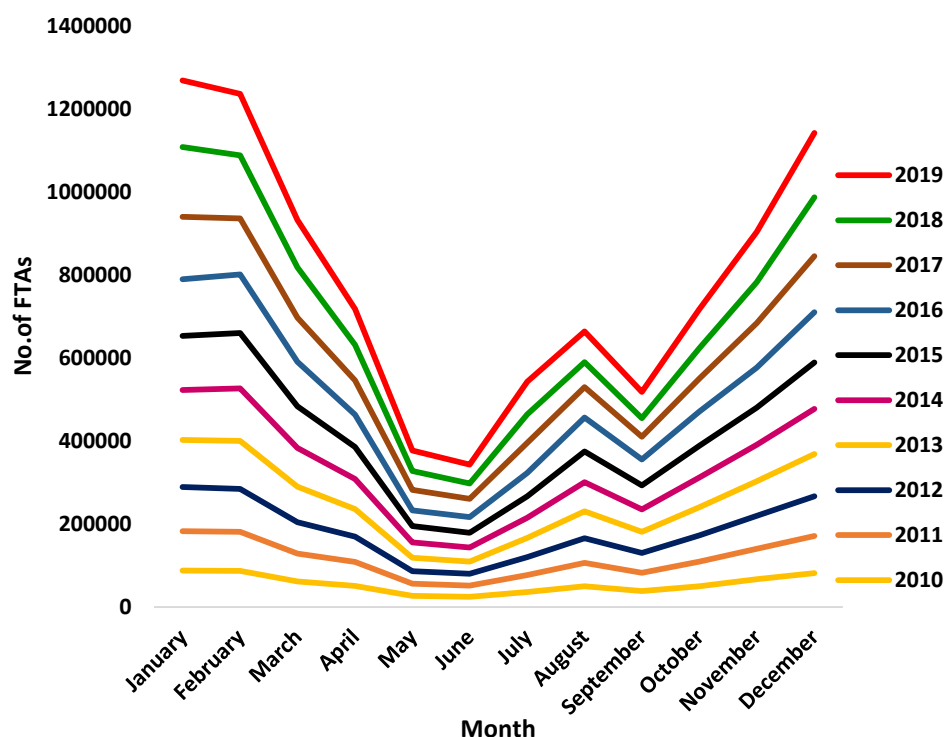
Source: Department of Tourism, GoK

Although the growth rate in Kerala was higher than that of India in most years, the State has been witnessing a declining growth rate after 2010. The number of foreign tourists who visited Kerala in 2019 was 11,89,771 as against 10,96,407 in 2018, recording 8.52 per cent growth as compared to 2018.

Seasonality in Foreign Tourist Arrivals

In 2019, around 14 per cent of the total foreign tourists visited the State in January followed by December (around 13 per cent). January 2018 also witnessed maximum number of foreign tourist arrivals followed by December. The lowest foreign tourist traffic in 2019 was registered in June (3.83 per cent) and this trend has been continuing for the last 12 years. Figure 2 depicts the month-wise comparison of foreign tourist arrival in Kerala from 2010 to 2019.

Figure 2 *Month-wise comparison of foreign tourist arrivals in Kerala from 2009 to 2019, in numbers*



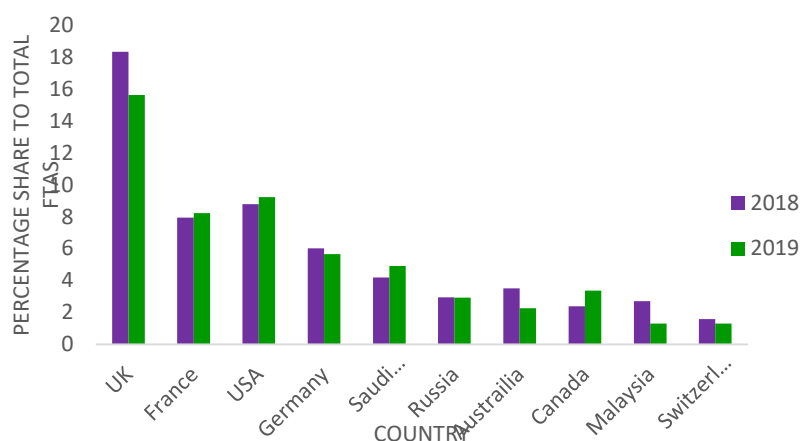
Source: Department of Tourism, GoK

Source Markets of Foreign Tourist Arrivals

Over the last decade, the United Kingdom, with a share of around 15 per cent, has been topping the list of the countries from which foreign tourists come to the State. The USA occupied the second position, with around nine per cent share. France and Germany are the other major markets. A notable feature in foreign arrivals in recent years is the rapid increase in arrivals from the Kingdom of Saudi Arabia and other GCC countries, indicating a sharp rise in interest in these markets for destinations in Kerala. The Tourism department, with its partners, has been consistently investing in developing these markets, through advertising campaigns, participation in travel fairs and organization of trade meets. Another feature that may have contributed to this phenomenon is the increasing connectivity of destinations with source markets, with flights by several international carriers connecting three airports of the State to capitals of the GCC

countries. Figure 3 illustrates the share of foreign tourist arrivals to Kerala from top ten countries in 2018 and 2019.

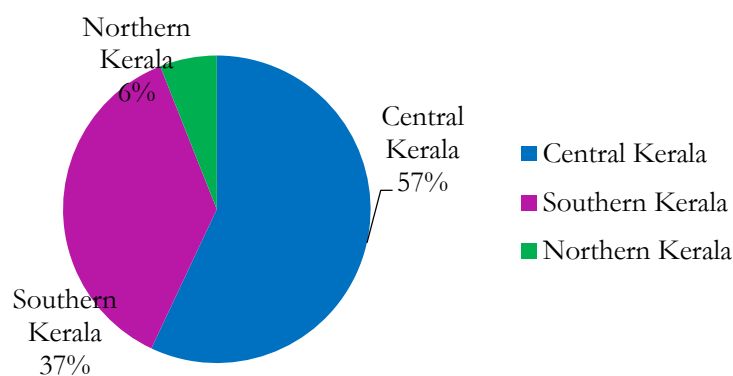
Figure 3 *Share of foreign tourist arrival from top ten countries of the world to Kerala in 2018 and 2019, in per cent*



Source: Department of Tourism, GoK

For the last few years, the two districts that recorded largest foreign tourist arrivals in the State are Ernakulam and Thiruvananthapuram. Pathanamthitta and Palakkad recorded the lowest number of foreign tourist arrivals. Region-wise figures of foreign tourists visiting the State indicate that around 57 per cent of tourists visited Central Kerala, comprising Ernakulam, Idukki, Alappuzha and Thrissur districts. Thirty seven per cent of foreign tourists visited South Kerala, comprising Thiruvananthapuram, Kollam, Pathanamthitta and Kottayam districts. It is notable that the six districts of North Kerala received only six per cent of the total foreign visitors to the State. Figure 4 presents the region-wise arrival of foreign tourists in Kerala in 2019.

Figure 4 *Region-wise foreign tourist visits in Kerala in 2019, in per cent*

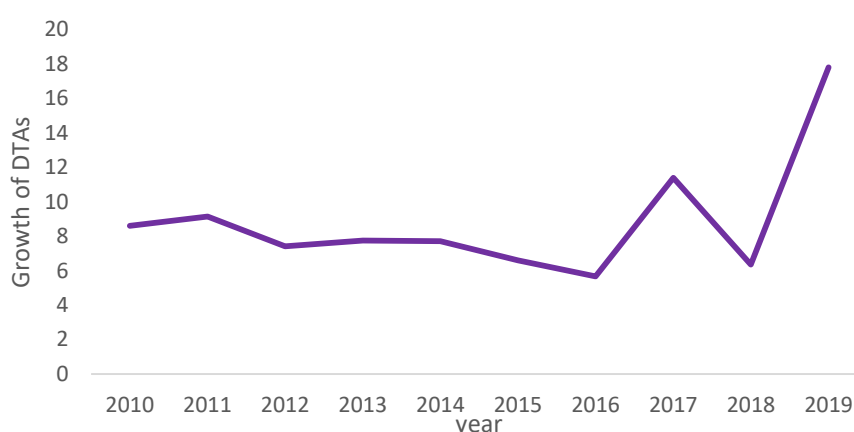


Source: Department of Tourism, GoK

Domestic Tourist Arrivals

The number of domestic tourist arrivals to Kerala in 2019 was 1,83,84,233, which is 17.81 per cent higher than the previous year. Figure 5 reveals the trends in the arrival of domestic tourists in Kerala during the period 2010-2019.

Figure 5 *Annual growth rates in the arrival of domestic tourists in Kerala from 2010 to 2019, in per cent*

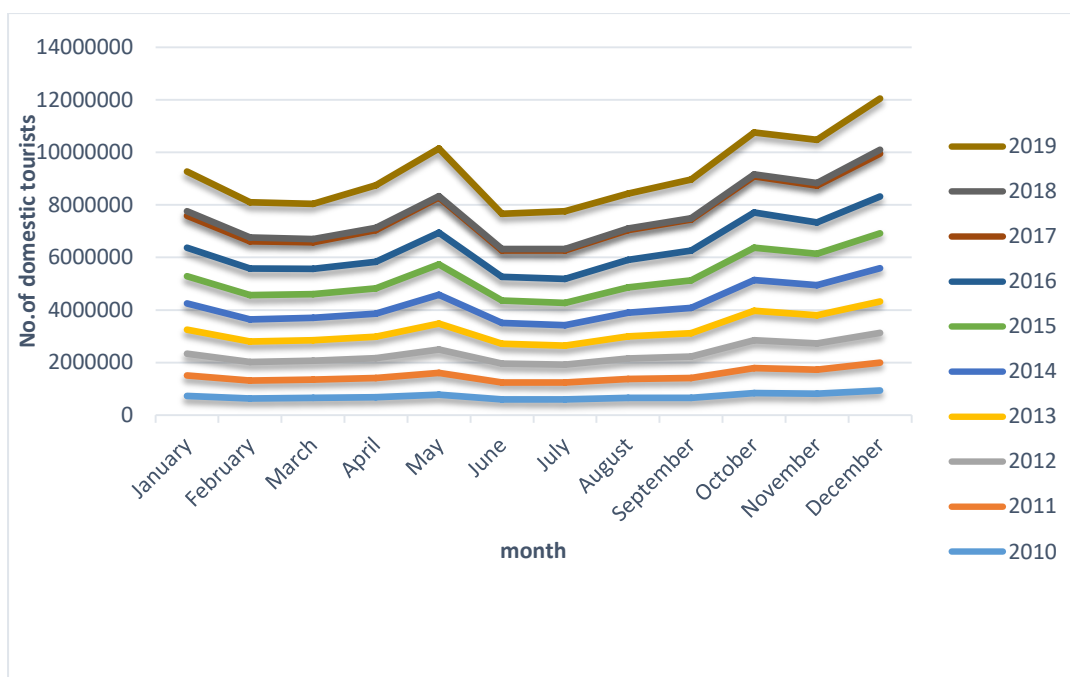


Source: Department of Tourism, GoK

From 2009 to 2011, the growth rate in Kerala with respect to domestic tourist arrivals was increasing and then began to decrease. The State had been witnessing a steady growth rate during 2012-2014. In 2015, the growth rate was 6.59 per cent, which dropped to 5.67 per cent in 2016. But the year 2017 recorded 11.39 per cent growth in the arrival of domestic tourists in the State which dropped again in 2018 and reached 6.35 per cent. But in 2019, the State witnessed 17.81 per cent growth in domestic tourist arrivals.

The month-wise data on the arrival of domestic tourists in Kerala shows that the highest inflow of tourists was for the month of December and the lowest was in the month of August. Figure 6 portrays the month-wise arrival of domestic tourists in Kerala from 2010 to 2019.

Figure 6 *Month-wise arrival of domestic tourists in Kerala from 2010 to 2019, in numbers*

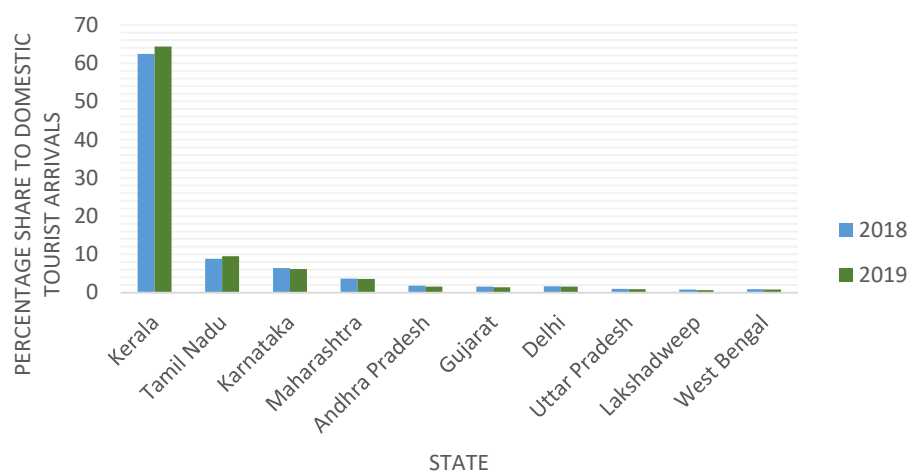


Source: Department of Tourism, GoK

Source: Markets for Domestic Tourism

The statistics on the distribution of domestic tourist visits in Kerala by State of origin reveal that about 64 per cent originated within the State. With respect to the distribution of other States, Tamil Nadu ranks first, with a share of around nine per cent, followed by Karnataka (six per cent) and Maharashtra (four per cent). Figure 7 shows State-wise share of domestic tourist arrivals to Kerala from top 10 States in 2018 and 2019.

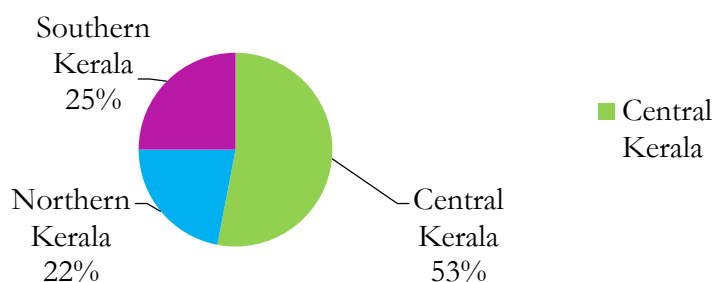
Figure 7 *Share of domestic tourist arrivals from top ten States to Kerala in 2018 and 2019, in per cent*



Source: Department of Tourism, GoK

Ernakulam and Thiruvananthapuram were the leading districts, with Pathanamthitta bringing up the rear. A region-wise analysis that districts of Central Kerala get about 53% of domestic visits, followed by South Kerala (25%) and North Kerala (22%). Figure 8 illustrates region-wise domestic tourist visits in Kerala in 2019.

Figure 8 *Region-wise domestic tourist visits in Kerala in 2019, in per cent*

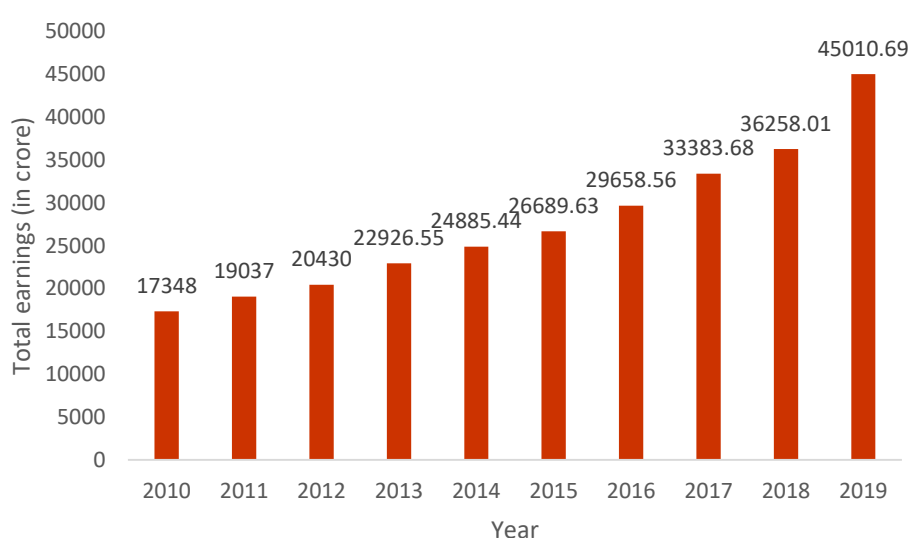


Source: Department of Tourism, GoK

Economic Impact of Tourism

The foreign exchange earnings from tourism in the year 2019 was ₹10,271 crore and domestic tourist earnings was ₹24,786 crore. Total earnings, including direct and indirect means, in 2019 was ₹45,011 crores, which is an increase of 24.13 per cent over 2018. Figure 9 presents total earnings from tourism in Kerala from 2010 to 2019.

Figure 9 *Total earnings from tourism during 2010 to 2019, in Rs crore*



Source: Department of Tourism, GoK

Initiatives of Department of Tourism

With a view to give a strategic direction and thrust to the sector, Government brought out a Tourism Policy outlining the new policy framework and significant areas of attention. Prior to the beginning of the tourism season, the department took the lead in ensuring the involvement of all concerned agencies, and embarked on the “Green Carpet” project, which focuses on cleanliness and safety in major destinations. More than 300 projects, with a commitment of over 300 crore rupees, were initiated in the last four years with a view to develop infrastructural facilities in destinations, most of which have been completed. Special emphasis has been given to the Malabar region, with over 100 projects sanctioned. The 325-crore river-cruise project centred on the eight rivers in North Kerala will open up this picturesque region for tourism, leading the way to more investment. The Jatayu Earth Centre, opened recently, is the best example of a vibrant public-private partnership model. Four projects taken up under Alappuzha heritage tourism project at a budget of Rs.29 crores have been completed.

The department of Tourism has taken several initiatives to promote the destinations of the State across national and international markets. The Kerala tourism YouTube channel is one of the most popular channels, with more than one lakh seventy thousand subscribers. A GIS based festival Inventory of Kerala has been prepared, with over a thousand festivals of the State. In order to retain its leadership position, Kerala Tourism launched innovative marketing campaigns on digital and social media platforms such as Kerala Blog Express, off-season promotion campaign and virtual reality houseboat installation. The department led delegations of private sector businesses on promotion and marketing initiatives, comprising of over 25 international roadshows, twelve international travel fairs, sixty national travel fairs and over thirty national partnership meets.

As part of a novel venture to protect and promote the traditions of water sports, Kerala Tourism launched the Champions Boat League conducted at 12 different venues across Kerala. The main objectives of the event are conservation and promotion of Kerala's traditional festivals, creation of an annual event to be marketed as a tourism product and exposure to lesser known backwaters.

Among the notable projects focused on developing destinations, special mention must be made on the Muziris, Thalassery and Alappuzha heritage circuits. There has been an emphasis on

developing infrastructure in the northern region, including infrastructure projects for developing basic amenities, information centres, and infrastructure for land and water-based adventure tourism. Small and Medium Industries Leveraging Experiential Tourism (SMILE) project implemented by BRDC aimed to promote and facilitate tourism based small and medium entrepreneurial ventures, which has resulted in 93 new entrepreneurs of which around 30 % are women entrepreneurs, and opening of 50 units with accommodation for 400 tourists. Infrastructure development for Guruvayur was taken up under PRASAD scheme of Government of India. Barrier Free Tourism to make destinations accessible for people with disabilities by providing differently-abled friendly infrastructure was taken up in seventy destinations. A comprehensive programme to develop ecotourism has been initiated.

As human resource development has been identified as one of the thrust areas, there have been several important steps taken in the State. A permanent campus for the State Institute of Hospitality Management was opened in Kozhikode. The Kerala Institute for Tourism and Travel Studies (KITTS) launched an online job portal and started a diploma and certificate course in adventure tourism. In addition, 114 regional and State level tourism guides underwent training programmes conducted by KITTS.

The innovative work of the department has won numerous national and international awards. Prominent among these are the UNWTO Award for Emerging Global Destinations – Accessible Destination award 2019 for Barrier-free Tourism Project implementation, the PATA Grand Award for Kerala Tourism “Human By Nature” Campaign, the Das Goldene Stadttor 2020 for Kerala Tourism “Human By Nature” campaign, the PATA Gold award for Kerala Tourism Campaign “Come Out and Play”, the PATA Gold Award for Kerala Tourism website, and the PATA Gold Award for women empowerment.

Responsible Tourism Mission

A unique initiative of the department that has caught the attention of the world is the Responsible Tourism (RT) movement that the State has started in several destinations. With its emphasis on economic, social, cultural and environmental responsibility, the RT Mission of the department has forged a new path in destination development, empowering local communities to take advantage of the economic opportunities presented by tourism. At present, there are over seventeen thousand individual and group units, out of which over thirteen thousand are women-led units, registered with RT Mission under various categories. There are 92,980 local community members are directly or indirectly linked with tourism and generating income. The registered

units of RT Mission generated ₹ 25.50 crore. 850 families are linked with the Experiential Tour Packages of RT Mission; 60 packages are operational. RT Mission launched Clean Kerala Initiative to keep prime tourism spots across the State plastic and garbage free. As part of the Kuttanad Package second phase, various tourism projects are getting expanded to the Kuttanad project area. Aimanam Village which comes under the Kuttanad project area, has been declared as the first Model RT Village.

Impact of Covid-19 on the Tourism Industry

Tourism is one of the sectors most affected by the Covid-19 pandemic, impacting economies, livelihoods, public services and opportunities on all continents. All parts of its vast value-chain have been affected. Export revenues from tourism could fall by \$910 billion to \$1.2 trillion in 2020. This will have a wider impact and could reduce global GDP by 1.5% to 2.8%. As many as 100 million direct tourism jobs are at risk, in addition to sectors associated with tourism such as labour-intensive accommodation and food services industries that provide employment for 144 million workers worldwide.

The Covid-19 pandemic had brought business of all tourism stakeholders to a standstill, affecting the livelihood of entrepreneurs as well as employees of the industry. The tourism industry in the State is facing unprecedented losses in the wake of widespread disruptions in travel and restrictions in accommodation, entertainment and activities.

Anticipating 10 per cent growth over 2019, the number of foreign tourist arrivals estimated for the period from January 2020 to September 2020 was 9,01,971. However, as per estimations by the Department after the onset of Covid-19 pandemic, the number of foreign tourist arrivals is only 3,49,575 in this period, showing a 61 per cent decline in numbers. Similarly, assuming a 20 per cent growth in domestic tourist arrivals, the projected number of tourist arrivals between January to September, 2020 was 1,58,21,071. However, the estimated number of domestic tourists in this period is only 39,31,591. The decline in numbers is almost 75 per cent. The total loss in the sector from January to September 2020 is ₹ 24,971 crore. The loss in earnings from decline in foreign tourist arrivals is estimated to be ₹ 5, 274 crore and from domestic tourist arrivals is ₹ 19, 697 crore.

A scheme to support stakeholders in the tourism industry for the revival of the tourism sector has been announced. The Government of Kerala has announced the Chief Minister's Tourism

Loan Assistance Scheme (CMTLAS) in a bid to support the State's travel and tourism sector, which is badly hit by the Covid-19 pandemic. While entrepreneurs/establishments in the travel and tourism sector can opt for Tourism Working Capital Support Scheme (TWCSS) to stay afloat, employees engaged in the industry can avail of short-term personal loans under Tourism Employment Support Scheme (TESS). Houseboats owners can make use of Tourism Houseboats Support Scheme (THSS) to get financial assistance for executing urgent repairs and maintenance to the assets. Under the Tourism Guides Support Scheme (TGSS), eligible tourist guides will be given a one-time financial assistance. Through these relief measures, the Government of Kerala intends to help all the stakeholders of the industry to tide over the current crisis and start functioning as soon as the pandemic gets contained.

LOOKING AHEAD

The past few years have not been kind to the tourism industry of Kerala. A series of natural disasters, demonetization and the pandemic have all adversely affected the sector. Globally, tourism industry is one of the earliest to be affected by such problems, and often the last to recover. As the world grapples with dealing with the pandemic and its aftermath, the tourism industry will struggle to regain its trajectory, affected as it is by the travel restrictions, closure of businesses and sluggish growth of the national and global economies.

However, there are several indicators that Kerala will lead the country as it recovers from the effects of COVID 19. As statistics have shown, over 90% of the tourism business in the State is generated through domestic tourism, which is relatively more agile in recovering from shocks as compared to inbound tourism from outside the country. The sharp spike in arrivals registered during 2019 is a clear pointer to the resilience of the sector, driven mainly by buoyancy in domestic tourism. Indeed, the sector is showing signs of activity and increased business, almost immediately after the restrictions on inter-State travel were lifted. The Kerala brand still remains attractive and desirable, and it is only reasonable to assume that the industry will rapidly improve once conditions turn favourable.

The tourism industry and entrepreneurs would need working capital infusions for spurring this revival, and the State would do well to step in and facilitate this process through provision of easy financing options. The focus should be firmly on revival of domestic tourism, which will call for a more focused and aggressive marketing campaign in important source markets within the country. Keeping in mind the fact that competing foreign destinations such as Sri Lanka,

Maldives and South-East Asian countries would go all out to woo the same target markets, it is imperative that the department embark on a series of promotional programmes that will showcase the myriad attractions of the State. In parallel, the department has to work closely with industry associations so that there is a synergistic partnership between the efforts of the private sector and the overarching campaigns of the department. The industry has several issues with organs of the State, such as restrictive excise policies, infrastructural bottlenecks in destinations, destination management entities that are not friendly to tourism service providers and intrusive regulatory bodies. It is important to generate a positive and industry-friendly approach, and it is incumbent on the tourism department to take up these issues vigourously with sister departments and find solutions.

In the long run, Kerala should strive to strengthen its brand positioning, creating and promoting experiences that are unique and attractive. New destinations and products have to continuously be introduced, maintaining visitor interest and prompting repeat visits. There is clear scope for expanding operations into new areas, particularly in North Kerala, to which connectivity will continue to improve. The emphasis must be on facilitation of conducive business environment for micro, small and medium-sized enterprises (MSMEs), which form the backbone of private investment. Care must be taken to ensure efficient use of resources, environmental protection, preservation of cultural values and heritage. Kerala must continue to strive to strengthen its positioning as a resilient, competitive, resource efficient and environmentally sensitive destination.

CHAPTER 3.5

CULTURAL DEVELOPMENT AS ECONOMIC DEVELOPMENT

“Culture is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society” (Edward Taylor, 1871).

At the centre of all human endeavors there remains an imagination of a shared culture. Culture is the invisible and at the same time the most explicit link that connects human beings with each other in their collective spaces. Its necessity is felt both at our mundane levels of existence and to fulfill our moral and aesthetic requirements. Language, morality and signs are as much parts of culture as are arts, literature and memories. As opposed to traditional societies modern societies usually depend on rational and scientific knowledge. Nevertheless culture is still pivotal in regulating social and individual existence in modern times. Our sense of religion, language, morality, beauty has a greater role in determining our choices and in conditioning our thoughts and actions. The perennial human temptation to embrace, return and cherish own or adopted cultural systems and values as well as to follow its practices still remains unshaken. It is this depth at which culture operates in human lives that UN had incorporated cultural rights into the Universal Declaration of Human Rights via Article 27.

It is the time for a cultural turn in the history of economic growth and development of Kerala. Kerala is moving towards a situation, where the cultural field is becoming one of the major driving forces of the economy. As a result culture has got an important and expanding role in everyday life of the citizens and hence the economy. Generally, when an economy grows, the role and importance of agriculture and allied activities to start with and then the industrial sector diminish and those of the services sector increase. This structural dynamics of development is true in the case of the regional economy of Kerala too. Such a transformation is evident from the changing structure of social demand of the region.

Everyone wants high quality basic services along with new generation service experiences. It is common for a community with more basic amenities to opt for more leisure, entertainment and art and cultural experiences. This will automatically lead to the growth of entertainment industry. The crucial question is whether the cultural sector in Kerala is ready to grow in line with the explosive growth in the demand and consumption of cultural products. If the cultural sector of Kerala does not rise to the occasion, there will be an influx of foreign products. Cultural interaction with the world increases over time and this is inevitable too. The key question is whether Kerala is ready to embrace the new era in which the boundaries of cultural exchanges are widening and the market for cultural products is globalising. This is certainly something that affects not only the independent growth of our culture but also the future of the economy. In addition to importing foreign cultural products, our cultural products must be able to satisfy the cultural needs of the indigenous people and establish themselves in the outside world. Kerala has great potential and market for it. Our art and cultural heritage is so diverse and rich in such manner. We must be able to make use of the potential of the cultural sector to be the future driving force of Kerala's economic growth.

The idea of the connection between economic development and cultural transformation outlined above is important because it informs the strategy of development planning in the state. The Thirteenth Five Year Plan of the state has far been an attempt to put the above vision into practice. This is done with the help of liberal allocation of investible resources from the plan as well as the KIIFB on the one hand and by making governance more efficient on the other.

The Thirteenth Five Year Plan of our State envisages a cultural turn in Kerala's development in the near future, as a result of which, culture would develop into a major source of economic growth. For achieving the vision, substantial increase has been made in the fund allocation to the sector. The outlay provided for the development of Art and Culture sector in the last 5 years are detailed below.

Sl No	Year	Outlay
1	2016-17	9122.00
2	2017-18	13134.00
3	2018-19	14447.00
4	2019-20	15764.00
5	2020-21	15723.00

The total outlay in the sector increased by more than 70 per cent from 2016-17 to 2020-21. This notable achievement shows the conscious intervention of the government to nurture the cultural sector.

KIIFB has been instrumental in the increasing pace of development of Kerala. This is also evident in the cultural sphere. The Department of Culture designs various projects to accommodate the changing tastes and lifestyles of the people in line with the changing tastes of the world. KIIFB has approved 11 major projects for the Department of Culture. Its total cost is over ₹ 850 crore. The details of the projects are listed below:

(₹ In Crore)

Sl No.	Scheme	Amount
1	V T Bhattathirippad Cultural Complex, Palakkad	50.00
2	Subrahmanian Thirumunp Cultural Complex, Kasaragod	50.00
3	Setting up of Cinema Theatre at Alagappa Nagar, Thrissur	9.15
4	Sree Narayana Guru Cultural Complex, Kollam	50.00
5	Setting up of Cinema Theatre Complex, Perambra	100.00
6	Setting up of Cinema Theatre Complex, Kayamkulam	100.00
7	Setting up of Cinema Theatre Complex, Thalassery	100.00
8	Setting up of Cinema Theatre Complex, Payyannur	100.00
9	Development of Chithranjali Studio in to Film City	150.00
10	Abdur Rahman Sahib Cultural Complex, Malappuram	50.00
11	Setting up of Cinema Theatre Complex, Tanur	100.00
	Total	859.15

Source: KIIFB

The departments and institutions related to the umbrella of culture have proved that they can produce more welfare from every unit of resources expended than the rest of the sectors competing for resources. In spite of the disasters during the year, and the imposition of social distancing during 2020-21, the cultural sphere has been quite expansionary in terms of the feeling wellbeing it generated. The fragrance of cultural activities reached every nook corner of the state, thanks to the imaginative interventions such as the campaigns spreading the life messages of Ayyankali, Sreenarayana Guru, Mahatma Gandhi, the silver jubilee fellowship programme, Gaddiga, cultural exchange programs, Film festivals, Theatre festival, activities of the Malayalam Mission, diamond jubilee fellowship programme, renaissance of cultural complexes, rural art hubs, Nattarangu, Gandhi Raktha Sakshyam 2018, cultural festivals like Maveli Malayalam, special online activities especially during Covid outbreak and like.

Cultural Diversity in Kerala

Kerala has a rich heritage of arts and culture. Due to its peculiar geography to a great extent it was partly secluded from the mainland and its neighbours including Tamil Nadu; whereas it has had active links with Arabian and European societies through sea trade routes. For a long time Kerala costs, especially Muziris now known as Kodungallur, were the fulcrum of international spice trade. All world religions have reached Kerala before they entered the Indian subcontinent. Thus Kerala displays a curious mixture of cultural influences and a highly interreligious demographic composition, unlike many other Indian states. Malayalam, the main vernacular of Kerala, is influenced both by Tamil and Sanskrit, two of the most ancient languages of India. While historians and linguists believe that it has originated from Tamil or a related Dravidian family of languages, in the medieval times it had come under the heavy influence of Sanskrit. Kerala has owned a number of unique performing arts like Kudiattam, Kathakali, Kummattikali, Kannyarkali, Mohiniyattam, Thullal, Thirayattam, Padayani, Koothu and Keralanatanam. Besides these, ritual art forms of Kalamezhuthu, Sarpamthullal, Theyyam, Velakali and art forms of tribes provide the art buff both oral and visual delight. Kathakali is one of the oldest dance forms that combines major aspects of opera, ballet, masque and pantomime art forms.

The following folk arts are famous in Kerala 1. *Thiruvathirakali*, one of the traditional art of Kerala and it is played only by ladies, 2. *Parichamuttukali*, a martial art like Kalaripayattu, is commonly played as a ritual form. Usually parichamuttukali is played with holding sword and shield, 3. *Oppana*, it is an art form of Muslims in Kerala. It is played at ceremonial occasions mainly during marriage functions. Both men and women play Oppana. Songs used in oppana are in the form of Mappilapattu, 4. *Kolkali*, in other words, *Koladi* or *Kampukali* is a folk art of Kerala. 5. *Theyyam*, a ritual form of art in Kerala, Theyyam is performed as the worship of God. Goddesses like *Bhagavathy*, *Chamundi* and *Kali* have more importance in Theyyam, 6. *Margamkali*, it is a traditional folk dance of Syrian Christians in Kerala.

There are many institutions set up for the promotion and encouragement of art forms. Major implementing departments coming under the sector are State Archives Department, Department of Archaeology, Department of Museums and Zoos, Department of Archives and Cultural Affairs Department.

Cultural Institutions in Kerala

Here 'Cultural institutions' broadly indicate all the institutions working under the aegis of the Department of Culture. It includes various academies, institutes, bhavans, departments and memorial buildings or institutions, which carry out their activities with the financial aid of the Government and in particular, the Department of Culture. All these institutions play an important role in the cultural legacy of our State. Some important institutions are listed below:

	Name of Institutions
1	Kerala Sahitya Academy
2	Kerala Sangeetha Nadaka Academy
3	Kerala Lalitha Kala Academy
4	Kerala Kalamandalam
5	Kerala Folklore Academy
6	Kerala State Chalachithra Academy
7	Kerala State Jawahar Balabhavan
8	Bharat Bhavan
9	Margi
10	Vastu Vidya Gurukulam
11	State Institute of Encyclopaedia Publication

Kerala State Film Development Corporation: The Kerala State Film Development Corporation (KSFDC) was established with the prime objective of facilitating the production and promotion of Malayalam cinema besides developing a cinema culture.

One of the important activities of the Kerala State Film Development Corporation is the modernisation of theaters under the Corporation in various districts. The most important and notable intervention made by the corporation has been done as a part of the larger vision for gender empowerment. An amount of ₹ 3 crore is earmarked for facilitating (partially funding) production of 2 feature films by women directors to support an improvement of the role and the status of women in the Malayalam Film industry and ₹ 3 crore is earmarked for facilitating (partially funding) production of 2 feature films by SC /ST directors.

Kerala State Chalachitra Academy

The first film academy in India was established in Kerala. The Academy is registered as a Society under the Department of Culture to provide proper direction to the film industry, to act as an intermediary between the Government and the film industry, and for other activities related to cinema.

The academy's major projects are the International Film Festival, the International Documentary and Short Film Festival, National Film Festivals and Promotion of Malayalam Films Children's Film Festivals etc.

Chalachithra Academy has organised an online film festival, *Docu Scape* IDSFFK from August 21 to 28 during the days of Covid-19. Judgment of short film screen play competition has been done and the Magazine of Academy “Sameeksha” is being published.

International Film Festival of Kerala (IFFK) 2019

Kerala State Chalachitra Academy conducts International Film Festival of Kerala (IFFK) every year. A competition section for the films from Asian, African and Latin American countries is the highlight of the festival. The film festival of Kerala is also widely known for popular support and participation of people. Thiruvananthapuram hosted the 24th International Film Festival of Kerala from December 6 to 13, 2019. In the module "World Cinema" 92 films were screened. In different modules 183 films of renowned Directors" drawn from 73 countries, were screened in the Festival.

Malayalam Mission

Malayalam Mission was started in 2009, with the aim to acquaint the children of Non Resident Keralites with Kerala culture and Malayalam language. One of the main objectives of Malayalam Mission is to institute, supervise and co-ordinate Malayalam study centres in various parts of India and abroad with the co-operation of non-resident Malayalees across the world.

In 2016-17 the Mission started a new study centre in Tamil Nadu besides initiating activities in UK and Kuwait. During 2018-19, the Mission has more than 1,000 study centres in 14 regions of India. Study centres are also functioning in Singapore, Oman, UAE, Germany, Japan, Bahrain, Kuwait, UK, Australia, Ireland, Kenya, Finland, Hongkong etc. In 2018-19, training was given to the teachers of various study centres in India and study centre in Kuwait, annual examinations have been conducted in Delhi, Mumbai, Gujarat, Bangalore, Pune and Bahrain.

Box 1 Important Memorial Institutes in Kerala under the Department of Culture

Thunchan Smarakam: Thunchan Smarakam (Memorial) has been set up in memory of the father of Malayalam language, Thunchathu Ezhuthachan. The Memorial, established in 1964 and situated at Thunchan Parambu, Tirur in Malappuram district, endeavours to propagate the ideals of Thunchathu Ezhuthachan. Today, Thunchan Memorial houses a full-fledged research centre, Malayalam literature Museum, palm leaf library, auditorium for holding meetings, Saraswati mandapam and children's library.

Kunjan Nambiar Memorial Society: The activities of Kunjan Nambiar Memorial Society include imparting classes or Thullal, research on Nambiar's poems, presentation of thullal in schools, training in velakali, chenda, etc. Established by the Government of Kerala, the Kunjan Nambiar Memorial at Ambalapuzha was inaugurated in September 1967.

Vailoppilly Samskrithi Bhavan: Vailoppilly Samskrithi Bhavan is a cultural institution that serves as a platform for the presentation and preservation of Kerala's art forms and cultural traditions, while also facilitating research and record-keeping related to them.

Kumaran Asan National Institute of Culture (KANIC): Kumaran Asan National Institute of Culture (KANIC) was founded in 1958 with the aim of establishing an appropriate memorial for

this great individual who was in the forefront of Kerala renaissance.

Ulloor Smarakam: Mahakavi Ulloor Memorial Library and Research Centre, popularly known as Ulloor Smakaram is the centre developed in memory of great Malayalam poet and literary historian, Ulloor S. Parameswara Iyer.

Mahakavi P Memorial Art and Culture Centre: An art and culture centre set up in memory of one of the best-loved poets of Kerala, P. Kunjiraman Nair, who was better known by the single letter P. Managed by the Government of Kerala since 1981, the centre maintains an excellent library and runs a school of music and a Kathakali centre, named Kerala Kalabhavan.

Mahakavi Moyinkutty Vaidyar Smarakam: Mahakavi Moyinkutty Vaidyar Smarakam, established in memory of Mahakavi Moyinkutty Vaidyar (1852-1892) at his birthplace in Kondotty. This great poet, Mahakavi Moyinkutty Vaidyar made the greatest contribution to Mappilappattu. The centre also known as Mahakavi Moyinkutty Vaidyar Mappila Arts Academy, the centre runs certificate courses in 'Mappilappattu' and Mappila Kali.

Some other important Cultural centre and Monuments are listed below;

Govindapai Memorial in Kasaragod District, Tulu Academy, Vellore, P. Raghavan Memorial in Kozhikode District, SK Pottakad Mini Theater, Cherukad Memorial in Malappuram District, Edassery Memorial, Brahmananda Sivayogi Memorial, Induchudan Memorial, Olappamanna Memorial, Pandit Karuppan Memorial in Ernakulam District, Sukumar Azhikode Housing Renovation in Thrissur District, V. Samba Sivan Memorial in Kollam District and Basaveshwara Memorial in Kollam District etc.

Source: Economic Review, 2019

Cultural Directorate

Various development programs are being undertaken and implemented by the academies, various institutions and the Directorate of the Department functioning under the Kerala State Department of Cultural Affairs. Many projects are being implemented to preserve and nurture the unique artistic and cultural heritage of Kerala. The following are the projects / activities being implemented and various institutions including the contemporary Covid-19 days by the Directorate of the cultural affairs

- *Renaissance Cultural Complexes:* The Department of Culture is implementing a project to construct Renaissance Cultural Complexes in all the 14 districts of Kerala at a cost of about ₹ 50 crore each under the name of Renaissance Cultural Heroes. The projects are funded by KIIFB and the project will set up dance, music, theatre, seminar hall, video hall, library, open air theatre, galleries and stalls in each complex. The construction work of these cultural complexes and the land acquisition process are in different stages in different districts. The construction work of the complexes honoring Bhattathiripad, Sreenarayanaguru and Sreesubrahmanyam Thirumumpu (Palakkad, Kollam and Kasaragod, respectively) is in progress. Suitable land has been identified in six districts namely Kozhikode, Kannur, Thrissur, Malappuram, Kottayam and Alappuzha. Land acquisition in four districts is in its final stage. Steps are being taken to find suitable land in other districts
- *Vajra Jubilee Fellowship Scheme:* The Vajra Jubilee Fellowship Scheme is a project aimed at nurturing the unique art forms of Kerala and promoting deserving young artists. Under

the scheme, which is being implemented with the participation of Local Self Government Institutions, 1000 youth artists are awarded fellowship and deployed in 170 clusters across the State to impart art training to over one lakh students in various arts. The training is being imparted through 1000 centres across the state in over 45 art disciplines belonging to classical, contemporary and folklore. Syllabus and syllabi have been made available in all the districts to co-ordinate the project activities. Study materials are also provided for art training. The Department of Culture envisages the popularisation of the arts and the preservation of Kerala's unique folk art forms and cultural heritage through the Vajra Jubilee Fellowship Project. The Department of Culture provides a fellowship of ₹ 10,000 per month to the artists. Local Governments also pay ₹ 5000 per month to the artists.

Under the Vajra Jubilee Fellowship programme, online arts and crafts training is being provided to children and adults who are forced to stay indoors because of Covid – 19 pandemic. The online classes and performances are used to spread the public health messages. The artists of Thiruvananthapuram Corporation have started a Youtube channel called 'Kalaguru'. In Palakkad district, online art training called 'Kalagriham' is being provided to the public. Large numbers of non-resident have also registered for the online programmes. In addition, an online picture and cartoon exhibition was held under the leadership of various clusters.

- *Livelihood of Artists / Rural Art Hub:* The Grameen Kalakendram / or Artists' Livelihood Scheme is a scheme implemented by the Department of Culture to preserve the unique handicrafts and cultural heritage of Kerala and to ensure the sustainability of the livelihood of the artisans. The project covers 20 selected heritage villages in the state. 2000 artists are the direct beneficiaries of the project. The new generation in 17 of these villages has been imparted training in arts and crafts, market discovery and also training has started the production process there. Public facilities have been set up in 14 heritage villages to facilitate operations so far. The project aims to revive the state's declining handicraft heritage and ensure livelihood sustainability for those in the sector.
- *Nattarang:* The Department of Culture is implementing a project called 'Nattarang' on the humanitarian model of Thiruvananthapuram, where adequate space is available along the roadsides where public spaces are not available for art and cultural activities in rural areas and small towns. It also includes an open stage, dressing room, garden benches, sculptures, murals and solar lights. The estimated cost of a Nattarang is ₹ 20 lakh. The construction work of a Nattarang at Vadakkancherry, Palakkad is in the final stage. In addition, proposals are being considered for setting up of Nattarangas in Chengannur, Alappuzha and Vallikkunnu, Malappuram.
- *Martyrdom 2018 Celebration and Renovation of Sabari Ashram:* As part of the 70th martyrdom commemoration of Mahatma Gandhi, extensive events were organised under the name 'Martyrdom 18' at Payyanur, Thavanur, Palakkad, Vaikom and Venganur, which were famous for Gandhiji's visits. The event was rich in celebrations with exhibitions, seminars, discussions and public meetings that lasted for many days. In addition, the Department of Culture undertook the renovation work of the Palakkad Sabari Ashram where Gandhi lived with his wife Kasturba Gandhi. Hostel and auditorium for boys at

the monastery, the renovation work of the office building and the ashram pool is in the final stages. The renovation work of the ashram will be completed by January 2020.

- *Statue of Sree Narayana Guru:* As part of the 100th anniversary celebrations of Sree Narayana Guru's Proclamation of *No Caste*, a project was underway to erect a statue of Sree Narayana Guru. The statue is placed at 20 cents of land opposite the Museum Police Station and Kanakakunnu in Thycaud Village.
- *State Art Pension:* The Kerala State Art Pension Scheme is a scheme implemented by the Department of Culture for giving an assistance of ₹ 1500 per month to financially distressed artists and writers. As of August 2020, 2874 artists have been paid directly into the beneficiary's account. This funding is a great relief to artists who have been crippled during this Covid disaster.
- *Dependent Pension:* The department is implementing a special pension scheme to provide relief to the widows of deceased and famous artists. ₹ 4000 per month is being given to 8 persons belonging to this category.

State Archives Department

The State Archives Department functioning under the control of Cultural Affairs Department is an independent department formed in 1962. The department functions as the guardian of all non-current records of permanent value of the State Government and various Departments. The first step towards the formation of such departments in all the states in India was taken at the 34th meeting of the Indian Historical Records Commission held in Thiruvananthapuram during the tenure of the EMS – led government in 1958.

Besides the Directorate situated at Nalanda, Thiruvananthapuram the department has 3 regional offices one each at Thiruvananthapuram, Ernakulam and Kozhikode and five district heritage centres at Kollam, Idukki, Thrissur, Kannur, Wayanad districts

The main functions of the Department include the custody, care and management of records received in the Archives, acquiring documents of historical value, rendering technical advice and assistance on management and preservation of records to various departments and institutions. It also includes publishing of archival materials, creating awareness about archival materials among the public by organising exhibitions, seminars, historical research, besides providing the Government with such materials for the smooth conduct of administration.

Major activities of the department during the last four years can be summarised as:

- *Digitisation of Palm leaf Records and paper records.* Digitisation of palm leaf records and paper records is one of the on-going schemes of this department. This department has digitised 43,41,392 numbers of paper documents and 10,06,250 numbers of palm leaf records since 2016-17.
- *Publication of Archival Records.* Publication of selected documents is one of the main activities of this department. Department has published 6 books namely, Selected speeches of Freedom Fighters Vol.II, Vol.III Perumbadappu Grandhavari, Keralathile Pracheena Lipi

Mathrikakal, Selected documents on Vaikom Sathyagraha, Bharanabhasha Adisthana Rekakal during the last 4 years.

- *Setting up of Signature Archives.* By depicting the signatures of eminent personalities, department has set up a Signature Archives Gallery in Archives Directorate complex. The Museum was inaugurated by the Hon'ble Minister for Port, Archaeology, Archives and Museum on 30th May 2018.
- *Cultural Festivals.* To make the awareness about the value of our cultural heritage, a cultural festival is conducted by the department every year. In 2016 it was held at Hyderabad and in 2017 at Delhi, and Malabar Cultural Festival was conducted in March 2018 at Kannur.
- *Online Archives – Inauguration of Website.* To make awareness regarding the functions of Archives Department among public, Department has decided to form an interactive online website in 2017-18, and this website was inaugurated by the Hon'ble Minister for Port, Archaeology, Archives and Museum on 21st February 2019 at Thiruvananthapuram.
- *Formation of Community Archives.* Formation of community Archives is a novel initiative scheme by the Archives department for the conservation and acquisition of Archival documents of local importance among Kerala. As part of the first phase of the project, two community Archives camps were conducted at Pandikkad, Chembrassery of Malappuram district. The Heritage awareness, appraisal, listing, documentation, conservation, and acquisition are made in such camps.
- *Setting up of District Heritage Centre, Idukki.* District heritage Centre Idukki is one of the existing five Heritage Centres of this Department for the collection and Preservation of archival documents regionally. Since Idukki has a rich collection of our ancestral heritage especially tribal collections, the department has decided to set up a Heritage centre with an archival gallery for the preservation of such heritage. The department has taken preliminary steps to construct the District Heritage Centre, Idukki through Habitat technology. The setting up of Idukki Heritage centre at Idukki is in the final stage of construction.
- *Scientific Conservation of Archival Records.* As part of the community Archives project, Department has given scientific conservation to 20 major works of the Great poet Mahakavi Kumaranasan in the manuscript form and conserved about 55,000 important another archival records during 2017-18. Department has scientifically conserved 30,216 pages of archival records in 2018-19.

Major Projects

1. *Setting up of Palm leaf museum.* The Palm Leaf Museum is one of the major projects of the department. MoU has been signed with the Kerala Museum for setting up of Palm Leaf Museum. Preliminary works in connection with Palm Leaf Museum has also been started. An amount of ₹ 4 crore has been set apart for this project in the 2020-21 budget.
2. *Setting up of International Archives and Heritage Centre at Karyavattom, Thiruvananthapuram.* This is another notable project of the department. MoU has been signed with the Kerala Museum for Setting up of International Archives and Heritage Centre. An amount of ₹ 6 crore has been set apart for this project in the 2020-21 Budget.

Archaeological Explorations

The Department of Archaeology, one of the prime preservers of Kerala's heritage, has been working hard to preserve and protect our diverse and rich cultural wealth. The Department of Archaeology has been actively engaged in scientifically conducting archaeological excavation and explorations, conservation of Proto-historical, medieval and historical monuments, thereby preserving and protecting these cultural centres.

The major functions of the Department include publishing of volumes on stone-inscriptions discovered from various places, copying of writings on copper plates, conducting of excavations and explorations and measures to protect historical monuments dating back to 200 BC onwards which lie scattered in different parts of the State. The main sections active under the department now are exploration, excavation, chemical preservation, protection of structures, the study of inscriptions, numismatics, folklore, publications, awareness, documentation, and setting up and preservation of museums. There are 12 archaeological museums and 183 protected monuments under the Archaeology Department.

- *Important exploration and excavations*

During the last four years, the major excavations conducted by the department are:

1. Chengal cave excavation
2. Ichannoor cave excavation
3. Perumbadappu Valiya Kinar excavation
4. Nalloor excavation
5. Aranmula excavation

- *Acquisition of British India Coins*

Hon'ble Minister Kadannapally Ramachandran on behalf of the department took over 266 silver coins found while digging for agricultural purposes at Mundur in Kannur district. These are the coins in circulation in 1862. This is the first time the department has received so many coins.

- *Heritage festivals*

The presence of the Department of Archeology was notable in both the heritage festivals organised by the Department of Culture outside the State. The heritage festivals were held in Hyderabad in February 2017 and in Delhi in October 2017.

Malabar is the meeting place of a diverse culture. The Malabar Heritage Festival was a joint venture between the Department of Archeology and Bharat Bhavan. The festival was held on March 2018 in Kannur.

- *Numismatic Documentation*

The coins in the treasures received from Kerala for a long time are kept in the Archaeological Department. Comprehensive documentation work was initiated during this period as a prelude to make available to students these tools that could rewrite history. Documentation began in February 2018 under the supervision of a section committee. The authentication of 783 coins in the Angamaly treasury has been completed.

- *South Indian Numismatic Society Conference*

Department hosted in 2020 for the Annual Conference and Coin Study Seminar of the South Indian Numismatic Society. The two-day conference was attended by a number of experts from the concerned subject.

- *Heritage museums*

Heritage museums are being set up in all the 14 districts with the aim of showcasing the heritage of each district. Currently, the Thrissur District Heritage Museum has been completed and opened to the public. Idukki District Heritage Museum, Palakkad District Heritage Museum and Ernakulam District Heritage Museum are nearing completion. The work of setting up heritage museums in other districts is in various stages.

Museum Department

Museum and Zoo is an institution under the Kerala Department of Culture. The campus includes the Headquarters, Zoo, Botanical Garden, Art Museum, Natural History Museum and Sree Chitra Art Gallery. State Museum and Zoo Thrissur, Art Gallery and Krishna Menon Museum Kozhikode are the regional units of the institution.

Modernisation of Napier Museum

Over the past 4 years, as part of the modernisation of the Napier Museum, a mobile application has been developed to provide information on exhibits and their historical importance. The facilities like ramps, ample space for parking, wheelchairs etc. have also been provided. Information about the museum is made available in Braille and Hindi also. Four new battery vehicles were purchased for the use of the general public and visitors with differently abled.

Renovation of Natural History Museum

The Natural History Museum, Thiruvananthapuram which was started in 1964, is one of the rarest among the Museums in India with its large number and variety of specimens. But the mode of display of specimens in this Museum was quite old and not as interactive in comparison with the latest concept of Museology. The habitat cases and dioramas were mostly outmoded. In short, despite of having numerous valuable and rare collections, this Museum needs full scale modernisation in all aspects in order to cope with the modern trends of Museum concept. Hence, a series of works like creating new dioramas, a new area for interpreting our lost species of animals, new information facilities, new flooring and ceiling etc. have been undertaken. Now the entire works have been completed and inauguration of the completely renovated Museum is being awaited.

Sree Chitra Art Gallery

Sree Chitra Art Gallery, formerly known as Sri Chitralayam the center of attraction for thousands of tourists every day, was opened to the public by His Highness Sri Chitra Tirunal Maharaja of

Travancore in 1935. The gallery at present is functioning in an old low roofed, tiled structure is prone to fire hazards and raises security issues to the priceless and precious paintings displayed as well as stored in the gallery. In fact, the paintings are displayed in number of small rooms, limiting the space for proper display and the display has become overcrowded and unscientific. Very essential basic facilities such as museum library, conservation laboratory, proper store, security control and monitoring facilities, ticket counters, cloakrooms, public comforts and relief areas are now totally lacking in the present gallery.

Hence the Department has initiated action for the construction of a new building exclusively for displaying Raja Ravi Varma School of Paintings. This is also in consideration of 150th Anniversary of the composition of his first painting as well as Sree Chitra Art Gallery has the largest collection of Raja Ravi Varma paintings (43 Nos) in the Country. The Hon'ble Chief Minister of Kerala inaugurated the construction process of this prime project on November 2, 2020.

Upcoming prime projects

AKG Museum, Kannur

The museum is being set up in Peralassery, Kannur district, the birthplace of A K Gopalan, a valiant revolutionary who fought for India's independence and the resurrection of the oppressed.

Handloom Museum, Kannur

The construction of the Handloom Museum has been completed and only the work of setting up of the exhibits of the Handloom Museum is to be completed.

Theyyam Museum, Kannur

The Theyyam Museum aims to conduct the study and research potential of Theyyam, the heritage art of North Malabar. The foundation stone was laid by the Hon'ble Minister for Ports, Archeology and Archives and Museum on 28.02.2019.

CHAPTER 4.1

TOWARDS GENDER EMPOWERMENT

Introducing the concept of gender in planning circles makes it possible to view practices that are oppressive to women not solely as women's issues but as concerns deeply embedded in the unequal social relations between women and men. Of course, there are other sexual/gender minorities, of whom Transgenders, that is, those whose gender identity or gender expression does not match their assigned sex at birth, now officially recognized, are subject to stigma and discrimination which needs immediate redressal. Empowering TGs since 2016-17 is discussed in a later section.

Women's Empowerment

Gender-based discrimination that assigns to women lesser status and power, is deeply ingrained in the consciousness of both men and women and has remained remarkably stubborn, being generally viewed as a natural corollary of the biological differences between them. The separation in terms of household chores including care/family responsibilities and the public sphere is the visible face of a social order based on a sexual division of labour, that is, a distribution of tasks between men and women, according to which women are supposed to devote themselves first and foremost and "quite naturally" to the domestic and private sphere, while men devote their time and efforts to productive and public activities.

This distribution, which is far from being "complementary", has established a hierarchy of activities in which the "masculine" ones are assigned high value and the "feminine" ones, low value. Such a division of labour brings about unequal power relations between the genders and a host of discriminatory social and cultural norms and practices which oppress women.

The empowerment and autonomy of women and the improvement of their political, social, cultural and economic status is a highly important end in itself. Empowerment, has to be understood as a *process of change to improve women's position in society*, important components of which are women's access to improved levels of education, health, livelihood and resources; recognition, reduction and redistribution of their responsibilities in domestic and 'care' work; greater voice in decision making; participation in the process of development and public life within a safe and secure environment; and enhancing gender consciousness in society against gender stereotypes, discriminatory norms and practices, through effective programmes of awareness on gender equality.

The Kerala Scenario

It must be noted that development policy in Kerala has been more sensitive to gender equality in terms of human resource development reflected in the much lower gender gap in capabilities

such as education and health. Kerala's high sex ratio, well above unity, has been the most widely discussed indicator of women's status and continues to be favourable to women, 1084.

Much has also been written about the high levels of female literacy in Kerala, particularly in the dramatic decline in fertility in the seventies (total fertility rate declined from about 3.7 in the 70s to 1.8 in the 90s, that is below replacement level). In 2011 the literacy rate (of population 7 years +) for women in Kerala was 91.98 percent (65.46 for India) and for men 96.02 percent (82.14) much higher than all-India. Much was written about the 'high status' of women in Kerala and their central role, historically, in social development (Jeffery 1992).

However, the social transformation of Kerala over a prolonged period, though profound, was also uneven and a symptom of this unevenness is the survival of feudal-patriarchal attitudes and institutions, even though women's literacy, education and health care standards remain high. Patriarchy in contemporary Kerala is apparent in a generalised social commitment to women's domestic role; perception of male as head of household, and women themselves internalising patriarchal values. High rates of literacy and impressive levels of female education did not translate into rapid growth of paid employment for women nor into upward occupational mobility.

The well-recognised and measurable advances that women have made in Kerala, largely as a result of progressive public action, must not detract from the developments that picked up especially from the 1990s, namely, a rising visibility of gender-based violence, especially domestic violence; unemployment, especially of the educated; low and declining work participation rates; mental ill-health; downtrends in women's property rights; and rapid growth and spread of dowry. These developments intensified even as the levels of education continued to rise.

In the late nineties, based along the lines of UNDP's Human Development Index and Gender Development Index, state-wise indices developed in India ranked Kerala first, despite the emerging social ills, but with a low rank on the third index, namely that of income (reflected in poor female work force participation rates). Clearly, the robust development indices of education and health did not capture other aspects of emerging social and cultural attitudes to women that were slowly taking hold. Education, health and income were necessary but not sufficient factors for women's full empowerment. Scholars urged that other, non-conventional indicators (Mukhopahaya 2005[1]) should be studied as well. The need to desegregate conventional indicators further was also emphasized; not just levels of literacy but type of education, and not just physical health but also mental health (Kodoth and Eapen 2005). Other, non-conventional indicators were developed. For example, the time spent by women and men on unpaid domestic and care work; women's vulnerability associated with dowry-related crime and domestic violence; mental ill-health; patterns of education; decision-making at home; representation of women in professional/managerial roles; sex ratio at work; gender wage gaps; women in leadership and media; political representation and so on (Mukhopadhaya op cit, UNDP, World Economic Forum's Global Gender Gap Report since 2006). Also, more indicators have been developed in connection with SDG 5 to track Gender Equality globally.

Nevertheless, these worrying tendencies do not detract, at least in the minds of women, from what it means to be a woman in Kerala in comparison to other parts of the country. "Many

women, and people of non-normative gender identities, continue to emphatically reiterate a strong desire to inhabit a space like Kerala—a desire which itself can only be relational in terms of what else is available in India. Kerala seems to be a preferred space of citizenship for many. No matter how regressive its social imaginaries around gender are in real life, Kerala nevertheless seems to yield a space, a social terrain that empowers virtual yet tangible performances of gendered desires.” (Meena Pillai op cit).

In the Section that follows we highlight some of the major state interventions regarding women to take stock of what has been achieved on gender equality and women’s empowerment so far (focusing on the recent period) and review our progress on the women related SDGs and what other indicators of empowerment we could develop given our specificities.

Highlighting Kerala’s Interventions and Achievements for Empowering Women

Four major interventions need to be detailed out here:

1. Gender aware planning at the local level in the context of decentralized planning since 1996.
2. Setting up of Kudumbashree, a community organization of Neighborhood Groups (NHGs) of women in 1998 as the State Poverty Eradication Mission.
3. Setting up a separate Department of Women and Child Development in 2017 bifurcating the Social Welfare Department.
4. Gender Budgeting in the 11th Five Year Plan, more systematically developed in the 13th Plan.

These interventions did result in commendable achievements: (a) sensitised government and society to the fact that plan/budgets impact differentially on men and women, and hence women’s needs have to be built into the planning process; (b) made women more visible in public spaces; (c) enhanced female workforce participation rates; (d) created an enabling environment for women to work; (e) consciously planned for vulnerable/excluded women to empower them; (f) addressed the nutritional requirements of women and children; and (g) evolved innovative ways of addressing gender based violence (GBV) and rehabilitation of survivors.

We discuss them in some detail below; work force participation, employment/unemployment will be discussed in another Chapter.

1. Gender aware planning

The disturbing social developments in Kerala pointed out earlier did warrant urgent and immediate action from the government. The 93rd and 94th Constitutional Amendments heralding decentralized governance with one third seats reserved for women provided an opportunity to address women’s issues at the grassroot level. Decentralisation in Kerala, taken up in a campaign mode, meant not only decentralization of funds, functions and functionaries but also of planning, *which has enabled Kerala to carve out a different approach to development which is much more people centric.*

Introduced in 1996 in the 9th plan, after the local body elections in 1995, the attempt to integrate gender into planning at the local level by (a) mandating that LSGIs should set apart 10 percent of the devolved plan funds for women specific projects (WCP); and (b) that gender impact of all other schemes should be assessed, appears to be a first attempt in the country towards ‘gender aware planning’, aimed at a more transformatory outcome for women. Despite its disappointing beginning in 1997-98, there was some improvement in the following years. Corrections were made and guidelines evolved for designing women's projects and the allocation pattern changed considerably in favour of better quality and more diversified projects. While decentralized governance certainly enlarged the choices and capability levels of elected women representatives at the individual level, overall plan performance at the local level in relation to gender issues was uneven since a recognition of needs/interests remained largely at the level of rhetoric in policy making and was not translated into appropriate projects at the level of implementation..

However, with renewed efforts, new set of guidelines for formulation/implementation of local plans in the second phase of decentralized planning (coinciding with the 13th Plan), and attempts to develop and strengthen WCP (proportion spent is still largely less than 10 percent), together with KILA’s trainings to elected representatives, some new schemes have been initiated and some older schemes were revamped to become model projects now--setting up Gender Resource Centres, rejuvenated Jagratha Samithis.

It is interesting to note that three projects started some years ago, have become model projects. These are (1) Vanitha library, a project under the women component plan of Balussery Grama Panchayat, Kozhikode district, which started as “A Space for Women” in 2000 ; (2) Vanitha canteen, a project under women component plan of Vaikkom Block Panchayat, Kottayam district started in the 9th plan; and (3) Distribution of menstrual cups, a project under the women component plan of Vazhoor Grama Panchayat, Kottayam district, started in 2007-2008.

At present, there are 1200 Local Governments, which includes 941 grama panchayats, 152 block panchayats, 14 district panchayats, 87 municipalities and 6 corporations. While the reservation for women is now 50 percent in Kerala, it is so also in decision making positions, presidents/vice presidents/chairpersons/vice chairpersons/mayor/deputy mayors. Women elected to panchayati raj institutions in Kerala constitute more than 50 percent, in fact 54 percent, while it is 46 percent for all India. In the elections to local bodies, held in December 2020, 11,837 women were elected to the five tiers of the panchayat structure (See Table 1). The difference in these elections is that many of the candidates were young. The youngest person to get elected to the prestigious post of Mayor of Thiruvananthapuram was 21-year old Arya Rajendran, a second year student in the local college, setting several new firsts in Kerala and the country.

2.Kudumbashree

Kudumbashree, a community organization of Neighborhood Groups (NHGs) of women set up in 1998 as the State Poverty Eradication Mission functioning under the Local Self Government Department has very soon become a world model for economic, social and political empowerment of women. Its growth has been phenomenal, bringing together women from all spheres of life in rural and urban areas, and has helped women to come out of the kitchen into

the public sphere. Starting initially with thrift and loan activities, the NHGs focused strongly on empowering women through income generation activities and seeking micro-credit, besides engaging in a range of other activities such as health, nutrition, agriculture, and social development. In the year 2015-16, 39.87 lakh families were covered under 2.58 lakh of NHGs. As of now, Kudumbashree has a participation of 44.91 lakh women and 2.99 lakh NHGs. It also converges with panchayati raj institutions in several schemes.

During the last four years of the government, concerted efforts, both quantitative and qualitative, were taken to expand its area of operation to include elderly, disabled and transgenders; to capture the employment opportunities arising in the state; and also to work out business models to make the enterprises self-sustaining.

In this section we provide information on Kudumbashree's thrift and credit activities, while micro-enterprises in agriculture and non-agricultural activities are discussed in Section on Employment.

Thrift and credit activities-

Upto 2015-16, the thrift amount was Rs.2932 crore and the internal lending was 12,134 crore. As of 2019-20, the total thrift collections by NHGs in the state comes to Rs. 4,982 crore and the internal lending generated is to the tune of Rs. 20,047 Crore. The total amount which has been mobilized under linkage loans (cumulative) comes to Rs. 19,460 Crore for 2,83,406 NHGs.

Interest Subsidy:-

The Government of Kerala had launched a new interest subsidy scheme in the year 2016-17 and NHGs are eligible for interest subvention to avail the loan facility at an interest rate of 4% on credit upto Rs. 3.00 lakhs. An amount of Rs. 84.47 crore was disbursed to 1,61,551 NHGs as interest subsidy till September, 2020.

Matching Grant:- Matching Grant at an amount of 10% of the savings of the linked NHGs has been provided subject to a maximum of Rs.5,000/- per NHG. A total of 41,125 NHGs received matching grant till August 2020.

Revolving Fund -Rs. 50,000/- is provided to all ADSs to support livelihood activities in the field. Revolving Fund distributed to 386 ADSs till march 31st, 2019.

Revival of Insurance Scheme: Under the Kudumbashree Sthree Suraksha Yojana (KSSBY) Insurance scheme, 5.3 lakh Kudumbashree members have been enrolled.

Kudumbashree played an important role in the post flood/pandemic recovery measures taken by the government for putting money into women's hands as immediate relief given below:

- *Resurgent Kerala Loan Scheme (RKLS):* - Government of Kerala introduced the 'Resurgent Kerala Loan (RKL) Scheme', with an aim of providing interest free loan upto ₹1.00 lakh

per household (female headed) to the 2018 flood affected Kudumbashree members who were the beneficiaries of the immediate flood relief of ₹10,000 announced earlier. The interest of the loan at 9 per cent was borne by the Government. Upto August 2019, interest free loan of ₹1,680.13 crore was provided to 1.95 lakh people through 28,212 NHGs.

- *Chief Minister's Helping Hand Loan Scheme* : (Rs.2000 crore loan). So far 2,05,000 number of NHGs and 23.00 lakh members got the benefit of this interest free loan scheme as Chief Minister's 'Sahayahastham' (Helping Hands) loan scheme declared by the Government of Kerala on 19th March 2020 in the wake of the pandemic.

Kudumbashree Gender Development Programme

Besides economic empowerment, Kudumbashree promotes social development of women through their participation at various levels, role in decision making process and programmes to tackle the issues of atrocities against women and building a preventive system in the society.

- *Snehittha Gender Help Desk*: - is one supportive activity which works in all 14 districts to provide support and rehabilitation service to distressed women and children. There are 647 Gender Resource Centers working across Kerala as on 10-January-2020. Other activities of training, research, leisure are also organized in these centers. Gender sensitization training was given to 1064 CDS chairpersons till 2020.
- *Rangasree*: is a program to train selected women from Kudumbasree in Theatre with the aim of establishing community theatres in every CDS of the State. It also aims to disseminate the messages of social justice, equality, sustainable development etc. As of now there are 14 Rangasree units in the State.

It is argued as a critique of WCP and Kudumbashree that the vast network and collectivity of women mobilized could have enabled women to lay claims and lobby for rights and resources. However, it must be remembered that these interventions, starting with decentralization, played an extremely critical role of pulling the women out of the households into the public sphere, mobilized them, building their individual capabilities and enhancing their choices. The larger transformatory change, it could be argued, needs a larger, concerted, sustained effort by state and civil society and is not the responsibility of women alone.

It is in this context that the setting up of a separate Women and Child Development Department and the more systematic approach to Gender Responsive Budgeting at the state level in the 13th Plan (initiated in the 11th Plan), should be viewed as the third and fourth turning points in approaches to gender equality and women empowerment in government policy making in Kerala.

III.Setting up of the Department of Women and Child Development

One significant achievement of the Left government was the setting up of the *Department of Women and Child Development* (WCD) in June 2017, (as promised in the Election Manifesto)

bifurcating the Social Justice Department to give a more focussed thrust to activities aimed at social assistance and empowerment of women and children. With the appointment of district level officers, the WCD directorate started functioning a few months later, implementing both state and central schemes. It is an umbrella structure that will include working of the State Women's Commission, State Women's Development Corporation, State Commission for Protection of Child Rights, Gender Park, Nirbhaya project, women and children homes, ICDS, Anganawadis. A large part of its working is concerned with running 44 welfare institutions for the care, protection and rehabilitation of women and children (16 for women and 28 for children); NGOs and voluntary organizations also play a major role in providing institutional care to the vulnerable population.

The programmes of the department seek to empower women and enable them to contribute as equal partners in development. Within less than three years of its functioning the department has initiated several programmes to address issues with respect to women and children as they emerged over the period, especially focussed on prevention of GBV, child abuse, innovative programmes for rehabilitation of survivors, gender awareness creation, good parenting, care and assistance to very vulnerable women like street dwellers, widows, female-headed families for meeting unexpected financial crises (Athijeevika), vocational training of women residing in welfare institutions to make them self reliant.

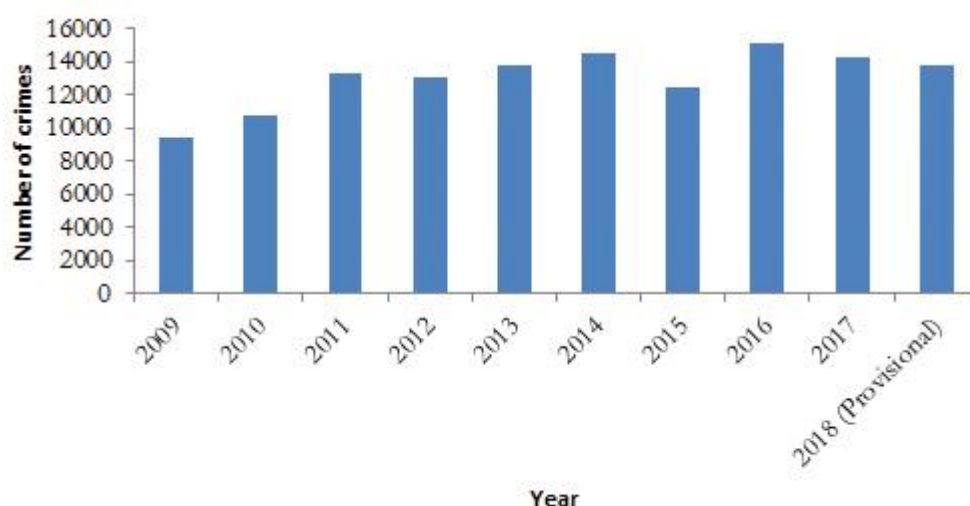
Mapping Progress of WCD since 2016-17

1. A website **wcd.kerala.gov.in** has been launched to create awareness among the general public about the schemes implemented by the Department of Women and Child Development and to monitor the activities of the Department.
2. Launched **Kerala Women's Portal** on International Women's Day in 2020, which covers the social, economic, cultural, historical and contemporary affairs of women.
3. '*Sadhyam munnottu*', a comprehensive programme on creating a gender conscious society for the safety of women has been revamped. A major initiative in the context of *Navothana Keralam* and an emphatic statement against blind beliefs regarding menstruation as a polluting phenomenon, was a programme inaugurated on 3rd December (Human Rights Day) 2018 by the Chief Minister of Kerala, in the presence of Minister of Health, Social Justice and Women and Child Development on the theme "Women, Menstruation and Women's Rights"; to be continued as a longer term programme for sensitizing people to menstruation being a normal, biological phenomenon.
1. Another very innovative programme was '*Pothuvidamentethum*' a walk at night programme held on Nirbhaya Day (December 29th) in the state to boost the confidence of women, removing fear of getting outdoors at night and ensure the role of society in accepting public space as belonging to all. It got a huge spontaneous response from women and was conducted in 600 centres across the state but had to be stopped due to Covid-19.
2. As part of legislative support to women and children, 14 District Child Protection Officers are working under ICPS scheme for implementing Protection of Children from Sexual Offences Act (2012).

3. *Karuthal*, a survey based project to find children in distress, and *Kaval*, a scheme to provide psychological and social assistance to children, are being run effectively. Classes are conducted for concerned departments related to children such as Police, Child Protection Units, ICDS functionaries, CWCs and Advocates - for giving awareness of the law against sexual abuse.
4. A very innovative programme to check child abuse was *Karuthal Sparsham-Nammal Kai Korkaam*, to conduct classes to all sections of society in responsible parenting.
5. District Collectors have been instructed to form internal complaint committees in all institutions, and local complaint cells in the unorganized sectors for ending sexual harassment at workplaces. Workshops were conducted at four major centers in the state to study the implementation of the 2013 Prevention of Sexual Harassment Act in the institutions.
4. Women Protection Officers are working in all districts for implementing Protection of Women from Domestic Violence Act 2005. Social Justice Department is implementing *Kaithangu* scheme as a pilot project in 350 wards of 70 panchayaths selected from the 14 districts by forming a task force to fight against violence. *Sradha* project is being implemented in collaboration with the Social Welfare Board to do likewise. A campaign was launched to ban dowry; goal is to eliminate dowry completely within five years and was launched on social media targeting the youth.
6. *Sakhi One stop centres* under WCD have been started in all districts for helping women who are the victims of violence in the family, public places, and work places. 24*7 services are provided in these One stop centres to the survivors
7. *Aswasanidhi* scheme is implemented for giving immediate financial assistance for women and children who survived sexual/ acid/cruel/sex based violence.
5. To promote gender awareness in girls from adolescence onwards, Women's Development Corporation has already set up women cells in 70 colleges. About 15,000 students are currently covered under the scheme.
6. The 181 Women Helpline, a 24-hour centralized scheme for women security, has been implemented since 2017 under the auspices of the Women Development Corporation. So far, the helpline has received over two lakh calls. Of those, 90,000 calls were serviced. 60,000 cases were settled.
7. The Women Development Corporation has set up 58 'She' toilets in different parts of the state to provide clean and safe toilet facilities to women travelers. A scheme has been envisaged for Fresh Up Centers to provide clean toilet facilities and breastfeeding during travel and first two centers will be opened in Angamaly and Changanassery.
8. "*Bodhyam*" a comprehensive programme for gender sensitization of police was launched in 2019 by the Women's Development Corporation as a pilot project for 135 police personnel, followed up by another 484 numbers and in 2020, it is being continued online with 2320 police personnel, men and women having undergone the training.
9. An integrated skill development programme for 50 tribal families started in 2018 and 18 women have formed a group for Tailoring, supported by WDC.
10. Most recently, it has undertaken an innovative advanced training programme for nurses to find employment abroad together with ODEPC and Centre for Management Development. Batch of 30 students and 180 will be trained before end of 2020-21.

11. In 2019, Womens Commission, conducted 185 seminars/legal workshops; 29 training programmes for members of Jagratha Samithis and 114 adalaths; and 29 pre-marital counseling sessions. It responds strongly to all violations against women's dignity, self respect and safety. Action is being taken for forming Jagratha Samithis under the leadership of Women's Commission in all panchayaths; workshops were also conducted focusing on the needs and objectives of Jagratha Samithies to the ICDS workers.
12. The Gender Park is an initiative under the Women and Child Development Department. Recently the UN Women has proposed a partnership with Gender Park to function as a South Asian hub and to become a premier convergence point for all gender related activities in the region. It is now poised to start functioning with the launch of the International Women's Trade Centre in early 2021 on its campus, together with a library and museum.

Figure 1 Total crimes against women in Kerala



As can be seen from the above, the WCD has placed substantial emphasis on policy and programmes that address major gender concerns in Kerala- reducing crimes against women, freedom in public spaces for women and, need to skill/train women for economic empowerment, prioritizing vulnerable women, protecting children through novel schemes. Figure 1 shows that there is a decline in Crimes against women in 2017 and 2018; however, data for 2019 and 2020 are still to come.

These are the very thrust areas on gender outlined in the 13th Plan, which guided our attempts to integrate a gender perspective into the Budget, bringing about some changes in favour of women in budgetary allocations as part of the planning/budgeting process.

IV. Gender and Child Budgeting since 2017-18

Gender Budget is not a separate Budget for women but is a methodology to assist governments to integrate a gender perspective into the Budget, recognising the economic significance of

women's unpaid household and care work and the need for public investment in these activities to enable women to be an integral part of the development process.

It seeks to break down the usual Budget through a well established methodology, across schemes / programmes to engage with visibilising women in each sector, recognising their contribution and emphasising the need to consider their needs/interests in the overall determination of development policy. The main weakness of efforts to implement the GB methodology on real Budgets in India, has been its limited ability to estimate the flow of budgetary resources to women due to non-availability of gender disaggregated data, getting bogged down in a number crunching exercise and the absence of a broader vision of including women as agents of the development planning process.

Kerala's achievement in Gender Budgeting lies in its attempt to address these lacunae through a more pragmatic and doable approach to GB. Certain essential steps to initiate and sustain the process were laid out: **(a)** First, the need for a strong Government commitment to GB, so it becomes an integral part of planning/budgeting. In the case of Kerala it was announced in the Finance Minister's speech in the first Budget of the 11th and 13th Five Year Plan; **(b)** Second, the need to identify thrust areas for women's development first, which guides the process of formulation of schemes, and then ensuring that funds are made available; **(c)** Third, creating awareness on the significance of gender across Departments, even those which are apparently "gender unrelated". Hence the focus on 100 per cent women's schemes in the 11th Plan (Part A of Gender Budget) which could be easily identifiable in several Infrastructure Departments, like Power, Transport, Ports, PWD, Civil Supplies, Excise, which have rarely come under the ambit of GB. (Kerala's GB attempt in Infra sectors is given as a Box in the 11th Five Year Plan of Government of India); **(d)** Fourth, since across sectors, larger resources flow to composite schemes which benefit both women and men, there was a felt need to develop a method of separating the allocations by gender. It became clear when doing gender budgeting that while macro-level gender disaggregated data may not be available, scheme-wise gender disaggregated information is available with Departments which can be accessed. Departments were encouraged/persuaded to break up total scheme outlays into components, especially those directed at girls/women, and make available gender disaggregated data on beneficiaries (anticipated or of previous year) or specify percentages allocated to women which could then be used to separate out the flow of resources to women from the total outlay (Part B of Gender Budget); **(e)** Fifth, the need to provide explanatory Notes at the end of Part B explaining the rationale of taking those allocations for women (Kerala was the first state to evolve a methodology for disaggregating composite schemes (Subrat Das----.)

Hence in the 13th Plan, Kerala has been able to develop a doable framework for gender budgeting, the overall thrust of which is on making Planning and Budgeting gender sensitive through **(a)** outlays allocated for 90-100 per cent women specific schemes (Part A of Gender Budget Statement); and **(b)** schemes in which women's share is specified or identifiable based on gender disaggregated beneficiary data, and is less than the above (Part B).

The thrust areas identified as priorities were **(a)** skill development, employment generation, livelihood security for women, in particular for vulnerable women (in the light of declining

WPRs of women and high rates of educated unemployment). Since child care and lack of other basic amenities (accommodation, travel, safety/security) hold women back from working outside the home, emphasis was also put on enhancing the reach of creche-cum-day care centres, home-stays for elderly, hostels and means of travel for women; and (b) Prevention of gender-based violence, redressal and rehabilitation in the context of continuing violence in the state (relating to targets 5.2, 5.4 and 5.5, 5a, 5b,5c of the SDGs).

While the Budget in 2017-18 had recommended at least 10 percent of total state plan outlay to be spent on schemes benefitting women, the allocations for women was 11.4 percent that year (4.5 percent in Part A and 6.9 percent in Part B) which increased to 14.6 percent in 2018-19 (5.7 in Part A and 8.9 percent in Part B) both in women specific schemes and in composite schemes, to 16.9 percent in 2019-20 (6.2 percent in Part A and 10.7 percent in Part B) and to 18.4 percent in 2020-21 (7.3 percent in Part A and 11.1 percent in Part B). The attempt in Kerala's GB has been to visibilise women across sectors in Plan write-ups.

Despite the unprecedented floods/landslides in August 2018, 2019 and pandemic in 2020, the percentage allocations for women in the Gender Budgets of the last three years did not decline given the critical role women played in livelihood revival/rebuilding Kerala programme. The Gender Budget in 2020-21, like the last two years, focussed on women's employment with a big thrust in particular on women entrepreneurship, which has seen rapid growth in recent years but has not been systematically mapped. Individual women Startups, nano-micro enterprises under IT and Industries sector, the special livelihood development package of Kudumbashree, self employment programme of Kerala State Women's Development Corporation, SHGs of other organisations have all played a major role in this activity. Prominent among livelihood programmes also, is the large expansion envisaged in NREGA employment to quickly restore livelihoods to women, a substantial increase in Ayyankali urban employment scheme, revival of livelihoods of women in the small/medium cashew factories.

A large infrastructure project for women to be known as International Women's Trade Centre (iWTC) will be set up at the Kozhikode campus of the Gender Park (an initiative under Women and Child Development) which will be a platform for women to safely start and expand enterprises, and market their products globally. Money has also been allocated for rehabilitation of returnee migrants for sustainable livelihoods

Second is the emphasis on *Navothanam Kerala* (Kerala Renaissance) the new, major initiative of the government of Kerala in the form of a massive campaign for creating a gender conscious society, launched on a pan-Kerala scale with the Vanitha Mathil on January 1,2019. One new scheme in the 2019-20 GB was the inclusion of a textbook module in schools on the Constitution, learning about women's and children's rights and historical struggles of women against obscurantist practices, called *Naitikam*, implemented by SCERT. This is supported by other programmes on gender awareness mentioned in the section on WCDD - a major initiative this year titled "Year of Women Safety 2020" to be implemented by the Police Department; also a very well received and effective scheme of the Police department is self-defence training, based on Krav Maga, (a self defence system developed for security forces in Israel) started almost one and a half years ago in which almost 15 lakh girls have been trained in schools, colleges,

Kudumbashree units, offices, residents associations etc.; awareness campaign against illegal migration by NORKA dept. Other novel schemes were to give girls/women greater access to public spaces, encouraging them in sports, swimming, rock climbing. (to be better prepared for disasters), art and culture. A major idea in the field of art and culture is partial funding/support for two feature films to be made by women proposed by KSFDC.

The third focus in the GBs is on our continuing attempt of providing an enabling environment for women to come out of their homes to work: enhanced allocations for anganwadis, creche-cum-day care centres, day care homes for the senior citizens, palliative care and mobile medical units to provide care for them at home, and providing facilities to SHGs to take care of adult girls and boys with intellectual disabilities.

Last but not the least is funding. Some areas are clearly lacking funds, for instance, the need to pay a reasonable wage to women workers or to upgrade several welfare institutions for girls/women, or clean toilets in public places, markets and bus depots, or funding for the disabled women. With the decline in allocations in almost all schemes for women at the national level, the burden on the states is astounding.

V. Some Observations and Way Forward

Two major outcomes of government's attempt at gender equality and women empowerment are striking (a) Women's workforce participation rates increased to 20.4 percent in 2018-19 from 16.4 percent in 2017-18, and is now higher than the all India level. In urban areas it is ; and (b) there appears to be some reduction in the crime graph of women in 2017-18, as Figure 1 shows. However, with the newspaper reports on domestic violence and rape, however, sporadic, the situation needs greater attention. Also though the increase is a good sign, there is no doubt that female WPRs are still very low, compared to an average of 40-50 percent in other S Asian countries and the upward tendency should be sustained.

It needs to be noted that Kerala still one of the top states in achieving gender equality. The NITI Aayog's SDG India Index 2019 places Kerala as one among the topmost states in its progress towards UN Sustainable Development Goals, including eradication of poverty and inequality (NITI Aayog 2019). What is interesting is that in SDG 5, which is on gender equality and so fundamental to many other SDG targets, Kerala is listed as one of the top states in India.

Nonetheless, much remains to be done in terms of changing the unequal gender relations which still characterizes the work structure at home and outside. Violence persists. However, the attempts in recent Covid-19 times, of women trying to break their shackles as expressed in the digital spheres and in changing modes of assemblages that seem to bring new registers to the social and historical processes of collectivity-formation, and generate new forays and modes for women to assert themselves and exercise agency (see Meena Pillai op cit) has resulted in an empowerment not easy to capture in quantitative terms. But it suggests that women are gaining greater autonomy to assert themselves and in that sense greater empowerment. The state in Kerala which has been more responsive to non-governmental pressure groups ushering in perceptible shifts and policy shaping, would have to do this more pro-actively on gender issues.

Work, as already cited, is underway on developing an indicator based on assemblage of women. Our objective in the next 20-25 years is further improvements in the targets mentioned in Goal 5, especially under 5.2 (eliminate all forms of violence against all women and girls in public and private spheres, including trafficking, sexual and other types of exploitation); 5.4 (recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family), and 5.5 (Ensure women's full and effective participation and equal leadership at all levels of decision making in political, economic and public life. Issues regarding very low wages earned by women in some major categories of work; gender wage gaps; social security for women and 5.b (Enhance the use of enabling technology, in particular information and communications technology to promote the empowerment of women. This will be discussed more in Chapter on Employment.)

CHAPTER 4.2

SOCIALLY DISADVANTAGED COMMUNITIES: SPREADING THE FRUITS OF DEVELOPMENT

The struggle against caste and the criminal practices of untouchability and similar forms of social exclusion was an intrinsic part of the struggle for freedom and socio-economic development in Kerala. The Government when it came to power in 2016 took efforts to build on this historical legacy.

In the 13th Plan, the Government made a commitment that the planning process will work to protect the rights of the people of the Scheduled Castes (SC) and Scheduled Tribes (ST), and to expand the socio-economic achievements of all people of the Scheduled Castes and Scheduled Tribes in the State. It also assured that the allocations to the Scheduled Caste Sub Plan (SCSP) for the people of the Scheduled Castes, and the Tribal Sub-Plan (TSP) for the people of the Scheduled Tribes will exceed the share of the population of Scheduled Castes and Scheduled Tribes in the State.

Scheduled Castes

Scheduled Castes in Kerala

According to the Census of 2011, the Scheduled Caste population of Kerala is 30,39,573 persons constituting 9.10 per cent of the total population of the State. There are 53 communities among the Scheduled Caste. The proportion of Scheduled Caste in the State is highest in Palakkad district (13.29 per cent) followed by Thiruvananthapuram (12.27 per cent), Kollam (10.80 per cent), Thrissur (10.67 per cent) and Malappuram (10.14 per cent). These five districts together account for more than half (57.17 per cent) of the total Scheduled Castes in the State. Communities such as Vedar, Nayadi, Kalladi, Arundhathiar/Chakkiliar are identified as the vulnerable communities among SCs and they are concentrated in Palakkad, Malappuram, Kollam and Idukki districts. Their population is 3.65 per cent of the total SC population (Scheduled Caste Survey Report, 2008).

Allocation and expenditure of SCSP funds from State Plan, 2016-17 to 2020-21

Every year, the State Government earmarks a portion of State Plan outlay as Scheduled Caste Sub Plan (SCSP) fund. Out of this allocation, close to 55 per cent is allocated to the SC Development Department (SCDD) and 45 per cent is allocated to Local Governments for implementation of schemes under decentralised planning. The year-wise allocation of SCSP funds is given in Table 1.

Table 1 *Allocation of SCSP funds from State Plan Outlay, 2016-17 to 2020-21, Rs in crore*

Year	Total State Plan outlay	SCSP funds from State Plan outlay	SCSP funds as percent of total State Plan outlay	Department		LSGI	
				Department Outlay	Department outlay as per cent of SCSP funds	LSGI Outlay	LSGI outlay as per cent of SCSP funds
2016-17	24000	2354.40	9.81	1315.50	55.87	1038.90	44.13
2017-18	26500	2599.65	9.81	1427.60	54.92	1172.05	45.08
2018-19	29150	2859.62	9.81	1570.36	54.91	1289.26	45.09
2019-20	30610	3002.84	9.81	1649.00	54.91	1353.84	45.09
2020-21	27610	2708.54	9.81	1487.39	54.91	1221.15	45.09
Total	137870	13525.05	9.81	7449.85	55.08	6075.2	44.92

Source: *Annual Plans, Government of Kerala*

In the last five years, Rs.13, 525.05 crore was earmarked as SCSP fund for the welfare of Scheduled Castes. Of which, Rs.7, 449.85 crore was allocated to SC Development Department and Rs.6, 075 crore to the LSGIs. The percentage of SCSP flow from total State Plan outlay was 9.81 in this period, higher than the proportion of SC population (9.1 percent as per 2011 Census). The percent allocation to department however declined slightly from 55.87 per cent in 2016-17 to 54.91 per cent from 2017-18 onwards.

The outlay and expenditure of SCSP funds from 2016-17 to 2019-20 is given in Table 2.

Table 2 *Outlay and Expenditure under SCSP, 2016-17 to 2019-20, Rs. in crore*

Year	SCSP Outlay	Department			LSGI		
		Outlay	Expenditure	% of expenditure	Outlay	Expenditure	% Of expenditure
2016-17	2354.40	1315.50	1126.88	85.66	1038.90	726.02	69.88
2017-18	2599.70	1427.60	1275.27	89.33	1172.05	936.6	79.91
2018-19	2859.60	1570.36	1167.40	74.34	1289.26	1070.07	82.99
2019-20	3002.80	1649.00	674.64	40.91	1353.84	734.61	54.26
Total	10816.5	5962.46	4244.19	71.18	4854.05	3467.3	71.43

Source: *Budget Document, Government of Kerala*

Note: 2019-20 figures are from Planspace

The expenditure by Local Governments increased from 70 per cent in 2016-17 to 83 per cent in 2018-19. In 2019-20, per cent expenditure by Local Governments in general was affected because of treasury restrictions. The expenditure under SC Development Department, however, declined in 2018-19 and 2019-20. This was mainly because of duplication of schemes and lack of

uniformity in rates of assistance of schemes implemented by the Department and LSGIs. Further in 2018-19 there was a reduction in plan outlay to all sectors to meet flood related rehabilitation and restoration expenses. In 2019-20, the resource crunch faced by the State resulted in low expenditure by the Department. In fact, if we see the expenditure levels of the Department against revised outlay, the percentage expenditure is much better at 92 per cent in 2018-19 and 75 per cent in 2019-20 as compared to 74 per cent and 41 per cent against budgeted outlay in the respective years.

Major Interventions by the Government and Achievements, 2016-17 to 2019-20

The main thrust of the 13th Plan in respect of the people of the Scheduled Castes and Tribes is in the following spheres:

1. *Land, homesteads, and housing.*
2. *Education.* Ensure full access to the best educational facilities at all levels: primary, secondary, and higher education and research.
3. *Skill development.* Prepare a new generation for modern employment, enabling them to seek employment in Kerala and elsewhere.
4. *Employment.* Ensure that places reserved for Scheduled Castes and Tribes are filled.
5. *Food security.*

The major schemes and programmes by the Government and the progress made on each front are enumerated in the following section.

1. Land, Homesteads and Housing

The Government provides financial assistance to persons belonging to Scheduled Castes for purchase of land and construction of house. From 2016-17 to 2019-20, Rs.76,497 lakh was earmarked for land purchase scheme and 87.72 per cent of expenditure was incurred in this programme. For construction of houses, Rs.1,34,500 lakh was earmarked and more than 100 per cent expenditure was incurred. Details of expenditure incurred under this scheme from 2016-17 to 2019-20 are given in Table 3.

Table 3 *Budgeted outlay and expenditure for land and housing, 2016-17 to 2019-20, Rs in lakh*

Year	Land			Housing		
	Outlay	Expenditure	% Of expenditure	Outlay	Expenditure	% Of expenditure
2016-17	17497	17573.61	100.44	26500	37362.4	140.99
2017-18	18000	17871.2	99.28	50000	56873	113.75
2018-19	22500	15468.05	68.75	38000	43660.2	114.9
2019-20	18500	16187.04	87.50	20000	13513.4	67.57
Total	76497	67099.9	87.72	134500	151409	437.21

Source: Scheduled Caste Development Department

In 2016-17 and 2017-18, houses were sanctioned directly by the Department. From 2018-19 onwards, construction of new houses is being undertaken through the LIFE Mission. As per the estimates of the Mission, there are 75,355 houseless people belonging to Scheduled Castes in Kerala. Of these 20,796 families own land and rest of them are landless. The Mission offers two options to the landless, one is to avail assistance at Rs.2.25 lakh for three cents in Grama Panchayat, at Rs.4.5 lakh in Municipalities, and at Rs. 6.00 lakh in Corporation limits to purchase land. The second option is to avail dwelling units constructed by the Mission in 28 towns across the State.

The total houses sanctioned and constructed under schemes of the Department and LIFE Mission are 49, 746 and 29, 542 respectively

Table 4 *Houses sanctioned and completed for Scheduled Castes, 2016-17 to 2019-20, in numbers*

Year	Scheduled Caste Development Department		LIFE Phase 1 (incomplete houses)		LIFE Phase 2 (beneficiaries with land)	
	Sanctioned	Completed	Sanctioned	Completed	Sanctioned	Completed
2016-17	14906	11440	3893	3843	21807	7506
2017-18	8895	6670				
2018-19	245*	83				
2019-20	0	0				
Total	24046	18193	3893	3843	21807	7506

Source: *Scheduled Caste Development Department and LIFE Mission*

Note: * These are houses that have been affected by the floods of 2018.

2. Education

Educational infrastructure for Scheduled Castes consists of 85 nursery schools, nine model residential schools, 44 industrial training institutes, 87 pre-matric hostels, 17 post-matric hostels, four pre-examination training centres, a community college in Vadakkancherry and a medical college in Palakkad functioning under the control of SC Development Department. In addition to the infrastructure facilities, the Government provides various types of educational assistances such as primary education aid, lumpsum grant, stipend, pre-matric and post-matric scholarship,

and overseas scholarships for studying abroad. Yearwise outlay and expenditure for education in the last four years is given in Table 5.

Table 5 *Outlay and expenditure for education, 2016-17 to 2019-20, Rs. in lakh*

Year	Outlay	Expenditure	% Of expenditure
2016-17	38000	13190.55	34.71
2017-18	40410	23675.99	58.59
2018-19	40549	25178.93	62.10
2019-20	25000	10874.42	43.50
Total	143959	72919.89	50.65

The major programmes and progress made in the field of education are as follows.

(i) Revision of rate of educational assistance

The rate of assistance including lumpsum grant, stipend, and scholarships given to Scheduled Castes for pre-matric, post-matric and professional courses were enhanced in 2019.

(ii) Assistance for studying abroad

A major achievement during the last four years is that 37 SC students have been provided assistance to study in top ranked (first 500) universities in the world. The Department provides Rs 25 lakhs per course to a student who gets admission in such universities.

(iii) Padanamuri

Another remarkable achievement for promoting education in this period was construction of a study room (Padanamuri) in the houses of SC students who are studying in high school and higher secondary classes in Government/Aided/Special/Technical schools. This facility is provided to students whose parent's/family annual income does not exceed Rs.1.00 lakh. The scheme provides Rs.2.00 lakh to each student to construct an additional room in their house (120 sq.ft) with all the facilities such as table and chair, book shelf, lights, and fan. A total of 16,276 study rooms have already been sanctioned out of which 7,563 have been completed.

(iv) Additional assistance to post-matric students

For encouraging post-matric education, a new scheme, 'Additional assistance to post matric students' was started in 2018-19. Under this scheme, State Government provides assistance to the post-matric students who are not availing any scholarships from Government of India. In 2018-19, assistance was given to 10,000 students.

(v) Other major physical achievements

- 7,971 students were provided assistance to purchase laptops and 1,366 MBBS students were provided assistance to purchase stethoscope.
- Entrance coaching was given to 2,189 students.

- More than 90 per cent students in model residential schools and 72 per cent of students in the Government Medical College, Palakkad passed examination in 2018-19.
- For motivating the students and parents, career orientation programmes were also conducted at higher secondary level in all districts.

3. Livelihood

For providing livelihood security to the weaker sections, income generating programmes such as self-employment schemes, assistance for seeking job abroad, and job oriented training programmes were undertaken under the scheme, “Training, Employment and Human Resource Development.” Self-employment assistance is given to the individuals/self-help groups with one-third of the loan as subsidy for undertaking self-employment ventures. Year-wise outlay and expenditure budgeted for the scheme is given in Table 6

Table 6 *Budgeted Outlay and expenditure for Training and Employment, 2016-17 to 2019-20, Rs. in lakh*

Year	Outlay	Expenditure	% Of expenditure
2016-17	4000	3313.61	82.84
2017-18	4000	3568.41	89.21
2018-19	4300	4193.17	97.52
2019-20	3800	3379.89	88.94
Total	16100	14455.1	89.78

The major physical achievements made in this area are as follows.

(i) Assistance for foreign employment

For seeking employment abroad, financial assistance of Rs.1.00 lakh is given to beneficiaries within the age group of 20-50 years and having annual income limit below Rs.2.50 lakh. Assistance is provided to meet expenses of job visa, passport, and travel charges. 1,610 SC youth have been placed abroad within the last four years. The rate of assistance was increased in 2016-17 from Rs. 50,000 to Rs.1, 00,000. Number of persons who availed self-employment subsidy and assistance for seeking job abroad are given below.

Table 7 *Number of persons availed who self- employment subsidy and assistance for seeking job abroad, 2016-17 to 2019-20*

Year	No. Of persons	
	Self- employment subsidy	Assistance for seeking job

		abroad
2016-17	542	446
2017-18	406	446
2018-19	297	318
2019-20	207	1922*
Total	1452	3132

*Note: * Includes spill over from last years.*

(ii) Food Craft Institute, Palakkad

In 2018-19, a Food Craft Institute was started in Palakkad district by Tourism Department in association with SC and ST Development Departments. It provides training in Hotel Management to SC, ST and general category students and job is ensured for the trained candidates in various institutions under Tourism Department.

(iii) Handholding cell and Mobile App

One of the outstanding achievements undertaken for the welfare of Scheduled Castes in 2018-19 was creation of a 'handholding cell' for equipping the SC youths through awareness programmes. A mobile app has been created for providing information and guidelines about the activities of the Cell. The SC beneficiaries who register in this App get information regarding higher education, job opportunities, and welfare schemes of the Department. In 2018-19, there were 2,810 SC youths registered as users in this App. The Cell serves as a monitoring cell to ensure that the beneficiaries get all the advantages of various scheme and projects.

(iv) Online web portal of Gadhika products

In 2018-19, new initiative, 'Gadhika in Amazon Online Portal' was launched for marketing of the products made by SC entrepreneurs. Variety of handicrafts and traditionally used utensils are marketed through this online portal. At present, nearly 20 items are marketed through the portal.

4. Health Care

The Government started a separate health care scheme in 2018-19. Until 2018-19, health care programmes were implemented under "Corpus Fund", which included allocation for several other purposes as well. Under the Health Care scheme, financial assistance for treatment is provided to beneficiaries. To avail the benefits of the scheme, the beneficiaries have to produce a

medical certificate from a specialist medical practitioner. Details of allotment and expenditure under this scheme are given in Table 8.

Table 8 *No. of persons benefited under Health care scheme, 2016-17 to 2019-20*

Year	No. of persons who received treatment assistance
2016-17*	23073
2017-18*	24423
2018-19	30844
2019-20	15658
Total	93998

*Note: * Scheme was included under "Corpus Fund" scheme*

5. Infrastructure Development in SC Colonies

For providing better infrastructure facilities in the habitats, 'Ambedkar Village Development scheme' was started in SC colonies where more than 30 SC families are residing. Under this scheme, Rs.1.00 crore is provided to each colony for undertaking development activities including provision of drinking water, toilet and sanitation, waste management, road connectivity, electrification, construction of land protection wall, irrigation, playground and community hall and renovation of houses, financial support for income generating activities, assistance for protection and renovation of burial grounds inside the colony/situated adjacent to the colony. Development activities have been completed in 50 villages from 2016-17 to 2019-20.

6. Social Development Programmes

(i) Vinjanwadis

For improving the social status of SC colonies, Vinjanwadis are functioning in the colonies. It includes facilities such as library, reading room, computer with internet facility, newspapers, journals and periodicals and necessary furniture. At present, there are 143 Vinjanwadi's throughout the State.

(ii) Special package for Vulnerable Communities

Major issues faced by vulnerable communities among SCs, such as Vedar, Nayadi, Kalladi and Arundhathiar/Chakkiliar are related to land, housing, drinking water, electricity, education, and

job oriented training. For addressing these issues, a special package was included in the State Plan in 2018-19. This package includes integrated colony development, completion of spill over houses, Samuhyapadanamuri, training on skill development and employment and special tuition. A new programme for providing assistance for purchase of agricultural land (upto a maximum of Rs.10.00 lakh for purchasing minimum 25 cents of land) has also been introduced.

(iii) Revision in rate of Marriage Assistance

Marriage assistance of Rs.75, 000 is given to the parents of SC girls with annual income limit of Rs.1, 00,000. In 2016-17, the rate of marriage assistance was enhanced from Rs.50, 000 to 75,000. Yearwise details of outlay and expenditure and families benefited under the scheme are given in Table 9.

Table 9 *Outlay and Expenditure for marriage assistance and no. of families benefited, 2016-17 to 2019-20*

Year	Outlay (Rs. in lakh)	Expenditure (Rs. in lakh)	% of expenditure	No. of families availed assistance
Year	Outlay (Rs. in lakh)	Expenditure (Rs. in lakh)	% of expenditure	No. of families availed assistance
2016-17	5000	5259.60	105.19	10523
2017-18	5500	5851.54	106.39	8921
2018-19	6500	5513.40	84.82	7291
2019-20	7000	6274.00	89.63	8677
Total	24000	22898.54	95.41	35412

(iv) Working women's hostels

In 2018-19, a new scheme was started for construction of working women's hostels. In the first phase, construction of hostels in Thiruvananthapuram, Ernakulam and Kozhikode districts was proposed. The construction work in Thiruvananthapuram district is nearly at completion stage.

(v) Valsalyanidhi

An insurance linked social security scheme, 'Valsalyanidhi' was started in 2017-18 for the holistic development of the SC girl child. Under this scheme, SC Department deposits Rs.1, 38,000 in the name of the child in Life Insurance Company in 4 installments - Rs.30, 000 as first installment, when the child attains 6 months, Rs.33, 000 as second installment when the child gets admission in primary school and attains 5 years, Rs.36, 000 as third installment on child

reaching 5th standard or at the age of 10 and Rs.39, 000 as fourth installment on completion of 10th standard. Rs. 3,00,000 is assured when she attains 18 years. Educational assistance of Rs.1, 000 is also given to the brother or sister of the girl child studying from 9th standard to 12th standard. 4,724 girls are registered under this programme.

(vi) Flood

The heavy rainfall in August, 2018 significantly affected the houses of persons belonging to Scheduled Castes in the low lying areas. 2,632 houses completely collapsed and 11,223 houses partially collapsed. In 2018-19, assistance was given for re-building of 245 houses which were damaged in flood. Of this, 83 houses were completed during the year. Financial assistance of Rs 5,000 was distributed to 83,872 flood affected SC families.

(vii) Cultural Programmes

SC Development Department publishes a journal called 'Padavukal' which includes features and articles illustrating the status of the weaker sections, stories and poems and details of schemes implemented by State and Central Government for their upliftment. Dr.Ambedkar media award is given for the best report writer. In 2018-19, a literary workshop namely 'Ranthal-2018' was organised for providing guidance to writers and 48 SC youths participated in the programme.

Review of Government Interventions

The policy of the Government was to ensure that the basic need for a decent housing is made available to all persons belong to Scheduled Castes. The provision of this basic necessity was brought under the umbrella of the LIFE Mission, the major housing programme of the Government. Important interventions were also made in the field of education by creating padanamuri and increasing the rates of financial assistance to students. A remarkable feature in the sphere of education was providing assistance to students to study in top ranked universities of the world. Health care received exclusive attention as it was made available through a separate scheme. The Government made significant efforts to improve the infrastructure in the SC colonies. The Government sought to balance its effort between welfare and income enhancement strategies. Livelihood creation was a key to this effort. Even in the midst of financial constraints, the Government maintained the share of funds of Scheduled Caste Sub Plan at 9.81 per cent.

Challenges and Way Ahead

Despite the significant advancement made in improving the lives of Scheduled Castes, there are challenges that still need attention.

(i) Traditional residential settlements of persons belonging to Scheduled Caste are located in low-lying areas and they frequently face damage from rainfall. This makes them vulnerable not only during floods but also in normal monsoon season. SC colonies therefore need to be located in areas that are habitable and safe from extreme rainfall events.

- (ii) There are high drop outs in professional courses.
- (iii) Access to opportunities for the educated work seekers in public and private sectors are limited.
- (iv) There is an increasing trend in the incidence of crime committed against Scheduled Castes in the last five years. It has increased from 245 in 2017-18 to 981 in 2018-19.
- (vi) There is duplication in selection of beneficiaries and differences in the rate of assistance for same schemes implemented by SC Department and LSGIs.

Scheduled Tribes

Scheduled Tribes in Kerala

According to the Census of 2011, the number of persons belong to the Scheduled Tribe (ST) in Kerala is 4,84,839 persons. It constitutes 1.45 per cent of the total population in the State. The highest concentration of STs is in Wayanad district (31.24 per cent) followed by Idukki (11.51 per cent), Palakkad (10.10 per cent) and Kasaragod (10.08 per cent). There are 1,07,965 tribal families residing in 4,762 hamlets in Kerala. About 11 per cent (540) of the tribal habitats are situated within reserve forests and 20 per cent (948) are in the immediate vicinity of reserve forests. There are five Particularly Vulnerable Groups (PVTGs) among Scheduled Tribes in the State – Kattunayakan, Kurumbas, Kadar, Koragas and Cholanaikkan. The total number of persons belonging to PVTGs is 26,273. There are 6,771 households residing in 603 settlements. PVTGs constitute 6.17 per cent of the total scheduled tribe population in the State.

Allocation and Expenditure of TSP funds from State Plan, 2016-17 to 2020-21

As part of the Tribal Sub Plan, all States have to earmark an amount from the state plan, which is equal or more than proportionate to the ST population in the State. Ever since the concept was introduced by Government of India, the state allocates funds to the TSP, always more than proportionate of ST population in the State (1.45 percent as per Census 2011)

Table 10 *Allocation to TSP, 2016-17 to 2020-21, Rs. in crore*

Year	State Annual Plan	TSP Annual Plan in Kerala	TSP as % of State Plan
2016-17	24000	682.65	2.84
2017-18	26500	751.08	2.83
2018-19	29150	826.19	2.83
2019-20	30610	866.26	2.83
2020-21	27610	781.36	2.83
Total	137870	3907.54	2.83

Source: Annual Plans

The allocation to TSP in the last five years has been consistent at 2.83 per cent of the State Plan (Table 10). The outlay is divided between the Local Governments (LGs) and ST Development Department (STDD) as shown in Table 11.

Table 11 TSP funds to ST Department and Local Governments, 2016-17 to 2020-21, Rs. in crore

Year	TSP funds from State Plan	TSP funds to STDD and other Departments	% Of TSP to STDD	TSP to LGs	% of TSP to LGs
2016-17	682.65	526.65	77.15	156.00	22.85
2017-18	751.08	575.08	76.57	176.00	23.43
2018-19	826.19	632.59	76.57	193.600	23.43
2019-20	866.26	663.27	76.57	202.99	23.43
2020-21	781.36	598.26	76.57	183.10	23.43
Total	3907.54	2995.85	76.67	911.69	23.33

Source: Annual Plans

An amount of Rs.3907.54 crore was earmarked for the welfare of Scheduled Tribes in the last four years. Of this Rs. 2,995.85 crore was allocated for STDD and Rs. 911.69 crore was for LGs. Year wise outlay and expenditure for implementation of schemes under ST Development Department and LGs for the last four years are given in Table 12.

Table 12 TSP Budget Provision and Expenditure from 2016-17 to 2019-20, Rs in crore

Year	STDD			Local Governments		
	Budget allocation	Expenditure	Percentage of Expenditure	Budget allocation	Expenditure	Percentage of expenditure
2016-17	526.65	518.05	98.37	156	109.74	70.35
2017-18	575.08	533.75	92.81	176	135.76	77.14
2018-19	632.59	502.23	79.38	193.6	151.29	78.15
2019-20	663.27	343.34	51.76	202.99	110.46	54.42
Total	2397.59	1897.37	79.13	728.59	507.25	69.62

The overall outlay of STDD includes outlay of schemes implemented by KIRTADS, Rural Development Department and High Court. The percentage of expenditure by STDD was more than 90 per cent in the first two years. It reduced to 79 per cent in 2018-19. In 2018-19, there was a general reduction in plan allocation in all sectors to the extent of 20 per cent to meet rehabilitation and restoration needs of the economy affected by floods. However, the percentage expenditure against revised outlay is more than 90 per cent. In 2019-20 also, percentage

expenditure was low. But if revised outlay is considered, percentage expenditure of department at 86 per cent is much higher than the expenditure against budgeted outlay.

The percentage expenditure by Local Governments shows an increasing trend in the first three years. In 2019-20, expenditure was low both by the LGs because of treasury restrictions.

Year-wise outlay and expenditure exclusively of ST Development department for the last four years is given in Table 13.

Table 13 *Outlay and expenditure exclusively of ST Development Department, 2016-17 to 2019-20, Rs in crore*

Year	Outlay exclusively for ST Dept	Expenditure of ST Dept	Percentage of expenditure
2016-17	526.65	499.01	94.75
2017-18	575.08	482.39	83.88
2018-19*	497.85	458.58	92.11
2019-20	624.88	391.05	62.58
Total	2224.46	1831.03	82.31

*Note: *Plan cut imposed. Hence the entire TSP allocation was not available for utilisation.*

Major interventions by the Government and achievements, 2016-17 to 2019-20

The main thrust of the 13th Plan in respect of the people of the Scheduled Tribes is in the following spheres.

1. *Land, homesteads, and housing*
2. *Education.* Ensure full access to the best educational facilities at all levels: primary, secondary, and higher education and research.
3. *Skill development.* Prepare a new generation for modern employment, enabling them to seek employment in Kerala and elsewhere.
4. *Employment.* Ensure that places reserved for Scheduled Castes and Tribes are filled.
5. *Food security.*

1. Land, homesteads and housing

Tribal Resettlement and Development Mission aims to provide land to landless tribes, housing, and other infrastructure facilities to the tribes. It also implements livelihood schemes for the resettled tribal families. Implementation of the Forest Rights Act (FRA) 2006 is also the mandate of the Mission.

(i) Forest Rights Act Implementation

The Forest Right Act, 2006 covers all Districts except Kasaragod and Alappuzha in the State. ST Department is the nodal agency for implementation of this Act. In collaboration with the Forest Department and Revenue Department, Individual Rights, Community Rights and Development

Rights of the tribes as prescribed under the Act are recognized and Record of Rights is issued. Major physical achievements under this Act from 2016-17 to 2019-20 are given below.

a. Individual Rights

- Individual Applications: 43237 received.
- Applications passed by Sub- Divisional Level Committee: 27674.
- Applications passed by District Level Committee: 26610.
- Total Individual Rights Title issued: 25848
- Total extent of land for which title issued: 34587.70 acre

b. Community Rights

- Individual Applications received : 1012.
- Applications passed by Sub- Divisional Level Committee: 475 .
- Applications passed by District Level Committee: 358 .
- Total Individual Rights Title issued: 174.

c. Development Rights

- Individual Applications received so far: 763.
- Claims passed by GramaSabha and sent to Forest Department: 763.
- Claims passed by Forest Department: 620.
- Claims in which Development Rights are issued: 466.

Table 14 *Details of land distributed in Kerala under various schemes, 2016-17 to 2019-20,in acres*

Name of Scheme	No. of beneficiaries	Extent of land (Acres)
Land Purchase	468	261
Record of Rights (FRA)	1318	1619
Revenue Patta	99	9.9
Vested Forests	2047	1407
Land distribution of Muthanga land struggle	225	225
Alappuzha land acquisition	43	10.75
Land transferred from Irrigation Department	87	17.40
Panthapra at Ernakulam	67	134
Total	4354	3684.05

In the last four years, 3,684.05 acres of land were distributed to 4354 tribal landless under various schemes. Most of the beneficiaries received vested forest land.

(ii) *Housing*

A major programme undertaken by the State Government is to provide housing to all scheduled tribes so that there will be no scheduled tribe family without a home in the state. As per a survey conducted by the Department in 2019-20, it is estimated that about 16,070 tribal families possessing land were houseless and 7,930 families are landless. Construction of new houses for homeless with land and building housing complexes for the homeless without land are

undertaken through LIFE Mission from 2018-19 onwards. Apart from the financial assistance from State Plan, assistance for housing is also provided by Kerala Urban and Rural Development Finance Corporation Ltd. (KURDFC). The funds earmarked by the Local Governments from their Tribal Sub Plan fund and Prime Ministers Awaas Yojana are also used for providing housing facilities to tribes.

In 2016-17, 6,709 houses were sanctioned under various schemes of Scheduled Tribes Development Department and of these 818 houses have been completed. The remaining 5,891 houses are in various stages of completion.

In the first phase of Life Mission, 12,049 houses were sanctioned, of which 11,216 have been constructed. Under Phase II of LIFE Mission, 6,107 houses have been sanctioned, out of which 2001 have been constructed.

A total of 24,865 houses have been sanctioned and 14,035 houses have been constructed under the schemes of Department and LIFE Mission.

Table 15 *Budget Outlay and expenditure for housing, 2016-17 to 2019-20, Rs.in lakh*

Year	Outlay	Expenditure	% Of expenditure
2016-17	5047.3	4629.36	91.72
2017-18	11508	11482.4	99.78
2018-19	12700	13781	108.51
2019-20	5720	7609.01	133.02
Total	34975.3	37501.7	107.22

During the last four years Rs. 3,4975.30 lakh was earmarked for housing sector and more than 100 per cent expenditure was incurred.

2.Education

Education was accorded the highest emphasis by the department. 30 per cent of the total budget provision (plan and non-plan) was set apart for education. Major educational programmes implemented by ST development department include pre-matric and post-matric scholarships, running of Model Residential Schools and hostels, peripatetic education to primitive tribes, tutorial scheme, *Gotbrasarathi*, *Gotbrabandhu*, *samuhypadanamuri* and incentives and assistance to students. There are 13 nursery schools, 10 kindergarten, three Balavadies, one Vikasvadies, three

Balavinjan Kendrams, seven peripatetic education centers for Particularly Vulnerable Tribal Groups, 20 Model Residential Schools, 22 single teacher schools, 106 pre-matric hostels, nine post-matric hostels, 12 training centers, two Vocational Training Centers, and one Industrial Training Institute functioning under the ST Development Department.

Even though the drop-out ratio among ST students has declined to 1.29 per cent in 2018-19 from 2.27 per cent in 2016-17, it is still higher than the drop-out ratio for all categories (0.12 per cent in 2018-19). The dropout issue is being addressed through concerted efforts involving measures to solve language problem, training and recruitment of teachers with right aptitude, offering quality education to students.

Budget Outlay and Expenditure for education in the last four years is given in Table 16.

Table 16 *Budgeted Outlay and Expenditure for Education Sector from 2016-17 to 2019-20, Rs. in lakh*

Year	Outlay	Expenditure	% Of expenditure
2016-17	15530	12140.4	78.17
2017-18	17090	14333.2	83.87
2018-19	19606	15903.4	81.12
2019-20	17939.5	13364.2	74.50
Total	70165.52	55741.24	79.44

In the last four years, Rs.70,165.52 lakh was earmarked for the promotion of education of ST students. Of this, 79.44 per cent expenditure was incurred. The expenditure pattern in the first three years shows an increasing trend. The non-plan expenditure was mainly in construction works.

The major programmes and progress made in the field of education are as follows.

(i) *Pre-matric and post-matric scholarships for ST Students*

The year-wise details of the number and allocation of scholarships are given in Table 17.

Table 17 *Number of students and expenditure, pre-matric and post-matric scholarships for ST Students, 2016-17 to 2019-20, Rs. in lakh*

Year	No. Of students	Plan expenditure	Non-Plan expenditure
2016-17	84482	3000.00	2280.00
2017-18	92145	3500.00	2280.00
2018-19	93359	3615.76	1842.26
2019-20	98602	4025.00	1501.00

(ii) *Rates of educational assistance enhanced*

The rates of assistances including lumpsum grant, stipend, scholarships etc. given to Scheduled Tribes were enhanced in pre-matric, post-matric and professional courses in 2019.

(iii) Community Study centres in tribal hamlets (SamuhyaPadanamuri)

For addressing the linguistic and dropout issues among tribal children and to create an ambience for education in hamlets, a significant initiative was the introduction of a new scheme, *Samuhya Padanamuri* in 2017-18. Under the scheme, Community Study Centres were started which were equipped with computers with internet, LED TV, furniture, and reading materials in tribal hamlets throughout the State. One educated tribal youth from the same community has been selected as a tutor and social worker. During the last two years, 250 community study centres were started and made functional in tribal concentrations. These centres have helped in reducing dropouts, improving the quality of education and also proved helpful in conducting online classes at the time of the Covid-19 pandemic.

(iv) Engaging Tribal Mentor Teachers in Primary Schools (Gothrabandhu)

Gothrabandhu scheme was initiated in 2017-18 to solve learning difficulties faced by tribal children because of language issues. An educated tribal youth (man or woman) with TTC/B.Ed qualification from the same locality with knowledge in tribal dialect and Malayalam is selected and trained to function as mentor teacher in Primary Schools. This has helped in reducing dropouts and ensuring cent per cent enrolment of tribal children in schools. Under the scheme, 267 tribal mentor teachers were appointed so far, in various primary schools in Wayanad and Palakkad districts.

(v) Tribal Girl Child Endowment scheme (Gothravalalyanidhi)

Gothravalalyanidhi was started in 2017-18 in order to achieve holistic development of tribal girl child from birth through various phases of her life including health and educational attainments. It is a long-term endowment scheme which attains maturity only after the child attains 18 years of age and has at least passed the 10th standard. The insurance amount can be used for higher education. This scheme includes cash payouts during immunisation and school admission stages. Insurance against death and permanent disabilities is also included. So far, 1576 girl children were insured under the scheme.

(vi) Other major achievements in education

- 2,216 orphans were provided financial assistance
- 1130 students in professional courses were provided laptops and the number of qualifying courses eligible for getting laptops were increased.
- Assistance provided to 6,000 students under Ayyankali Memorial Talent Search development scheme.

- Six new post-matric hostels were started in 2018-19 and 2019-20 to address the dropouts at higher education levels.
- Special coaching was provided to ST children for clearing NEET, KEAM and Civil Service Exams
- Additional model residential schools were sanctioned in Kasargod, Attappady and Wayanad and more science and commerce batches were sanctioned at higher secondary levels.
- All the Model Residential Schools under the department were modernized with facilities such as science lab, computer lab, library, language lab and smart class room, modernized kitchen and multipurpose playground.
- Majority of the pre-matric hostels were renovated and provided additional facilities.
- State level sports and arts festival were conducted exclusively for tribal children in Model Residential Schools and hostels.

3. Livelihood

(i) Millet village for Food Security

This is a new initiative intended for rejuvenating the tribal agriculture in Attappady. The scheme is jointly implemented by Agriculture Department and Scheduled Tribes Development Department. Apart from production of millets, pulses, oilseeds, vegetables and apiculture, it includes procurement, processing, packing, labelling and marketing of value added finished products of millets. Marketing is ensured through a quality branded organic product in the name of 'Attappady Organic.' This scheme has helped in addressing the issue of malnutrition among tribals.

(ii) Attappady Tribal Apparel Park (ATAP)

Attappady Tribal Apparel Park (ATAP) was started in 2017-18 for providing employment opportunity to ST Women in Attappady Block in Palakkad District. Under the scheme, six months intensive training in apparel making was provided to 250 ST women, with three months on the job training in factory. After successful completion of the training, a textile production unit was established in Attappady engaging 200 women. The unit stitches the uniforms of the children staying in the hostels and model residential schools under the department. The unit is also engaged in producing masks in the wake of the Covid-19 pandemic.

(iii) Skilled workforce initiative for construction industry (Gothrajeevika)

Another initiative for improving livelihood among tribes was the introduction of a new scheme, skilled workforce initiative for construction industry (*Gothrajeevika*) in 2017-18. The Department conducted a sustainable employment generation programme for the youth in all districts of Kerala. Skill training was given in masonry, carpentry, plumbing, wiring, and brick making. In the first phase, 1,170 beneficiaries were given training and 53 self help groups were formed in

construction sector. The beneficiaries of the scheme are now employed in the construction sector.

(iv) Agriculture income initiative for Scheduled Tribes

In 2019-20 a new scheme, 'Agriculture income initiative for scheduled tribes' was started for rejuvenating and revamping the existing agricultural farms in tribal areas. There are vast tracts of lands suitable for agriculture in these farms under the control of ST Department and Agriculture Department in tribal areas. These farms include Aralam Tribal Rehabilitation and Development Mission (ATRDM) area in Kannur, Sugandhagiri, Cheengeri, Priyadarshini and other farms in Wayanad, Attapady Co-operative farming society in Palakkad among others. The Detailed Project Report is being prepared for the project.

(v) Nutrition-sufficiency in food through agroecology in Attapady

For addressing the nutrition deficiency in Attapady Block, the ST Department initiated a pilot project in 2019-20. This project is being implemented in 19 Hamlets consisting of 612 families in 897 acres. 16 field co-ordinators from tribal community were recruited for supervising the projects and to support the farmers. The scheme aims to introduce nutrition-sufficiency in food through introduction of agroecology with close participation and management of tribal communities. This programme has many innovative dimensions including nutrition sufficiency, management by tribal communities, implementing provisions of the Food Security Act, climate resilient practices, peaceful cohabitation consistent with Tribal Practices, revival of rain-fed farming, convergence with MGNREGA, carbon sequestering, soil and climate resilient low carbon farming.

(vi) Kerala Tribal Plus and Revolving Fund of MGNREGA

In order to ensure maximum coverage of tribal families under MGNREGA and ensure adequate livelihood to tribals, the State Government enhanced the persondays of MGNREGA from 100 to 200, for all ST families in the state. The delay in wage payment because of the delayed fund release from Government of India was found as one of the major reasons for the tribal families dropping out from MGNREGA. The department created a revolving fund scheme for timely wage payment. It is implemented in Attappady, Aralam and Wayanad. A corpus of Rs. 2400 crore has been parked by the ST department with the MGNREGA and Kudumbashee Missions for implementing the above two schemes. Under this programme, 43,944 ST families had availed 100 days plus person days in the last two years. Year-wise details are given in Table 21.

Table 21 *Number of families who completed 100 days job, in numbers*

Year	No. of families availed 100 plus
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2018-19	22674
2019-20	21270
Total	43944

(vii) Career Guidance Programme, Skill Development and Placements

Department conducts career guidance camps and skill trainings for the unemployed ST youths. Based on the feedback from the career guidance programmes and skill gap analysis, skill training was provided in different job oriented technical courses. The trained youths were placed in both Government and private firms including multinational companies abroad. Since 2016-17, 5431 jobless youth had been trained in various fields and provided placements in reputed firms.

4. Health

Major health care schemes implemented for the welfare of Scheduled Tribes includes, comprehensive tribal health care, assistance for sickle cell anaemia patients, jananijanmaraksha and financial assistance to tribal healers. There are four mid-wifery centres, 16 mobile medical units, 17 Ayurveda dispensary, one Ayurveda hospital and five OP clinics functioning under ST Development department. Comprehensive tribal health care programme is implemented through hospitals, health care institutions, Tribal Relief Fund, health education programmes, and de-addiction campaigns in selected tribal hamlets. JananiJanmaRaksha scheme addresses nutritional issues of mother and child. Under this scheme, Rs.2000 per month is given to the mother from the third month of pregnancy to the month when child attains one year. Financial assistance of Rs 10,000 per year is also given to traditional tribal healers .

Budget outlay and expenditure under health sector for the last four years is given in Table 19.

Table 19 *Budget Outlay and Expenditure under Health Programmes from 2016-20, Rs. in lakh*

Year	Outlay	Expenditure	%oF expenditure
2016-17	2650	2600.39	98.13
2017-18	5240	3957.62	75.53
2018-19	4281	4239.36	99.03
2019-20	4373.5	3281.19	75.02
Total	16544.5	14078.56	85.10

(i) Mobile Medical Clinics

In 2016-17 and 2017-18, the department started 14 new mobile medical clinics (with GPS facility) to provide health service at the door steps of the tribes. The clinics are equipped with

doctors, paramedics and modern medical amenities. The mobile clinics are of immense help for the tribes living in interiors. The services provided by the clinics include the following.

- Antenatal services injection tetanus, iron and folic acid tablets, basic laboratory tests and referral for other tests as may be required.
- Identification and referral of complicated pregnancies.
- Post natal check up of women and children.
- Identification of unimmunized children and their vaccination for missed doses and /or administration of Vitamin-A dose.
- Screening of children for identification of malnutrition and their counseling and referral (where needed), de-worming.
- Counseling for spacing and permanent method
- Basic ENT and Ophthalmic check ups
- Identification and referral of complicated cases requiring facility based management

The number of patient's availed treatment under this scheme is given in Table 20.

Table 20 No. of patients who availed treatment under mobile medical clinics, 2017-18 to 2019-20

Year	No. of patients treated
2017-18	2430000
2018-19	1280000
2019-20	2025878
Total	5735878

(ii) Other achievements in health sector

- 30,500 beneficiaries received Distress Relief fund.
- Rate of assistance given to Sick cell Anemia patients enhanced from Rs.2000 to Rs.2500 and 720 patients received assistance.
- Rate of assistance under the scheme JananiJanmaRakshawas enhanced from Rs.1000 to Rs.2000 and assistance was given to 44,640 beneficiaries.
- Under the food support programme, 88,000 ST families throughout the state were provided food kits during the monsoon season
- 1,22,728 patients received treatment under comprehensive tribal health programmes
- Community kitchen in Attappady helped in enhancing the nourishment of the vulnerable population including pregnant and lactating mothers, children, adolescents, senior citizens, chronically ill tribes

5. Infrastructure Development

(i) Ambedkar Settlement Development Scheme

In 2017-18, Ambedkar Settlement Development scheme was started for meeting the immediate requirements of infrastructure facilities including water supply, sanitation facilities and resettlement of tribals living in difficult conditions, for promoting economic activities and

meeting the basic minimum needs of women and children. 94 colonies were selected for infrastructure development. Work in 4 colonies is completed and remaining works will be completed in 2020-21.

(ii) Critical Gap filling scheme or Corpus Fund under TSP

After allocating TSP funds to various ongoing schemes, a portion of the balance funds is maintained as a pool for meeting the fund requirement of various critical gap filling programmes under TSP. This is a need-based scheme, which is operated on a project mode. While funds under this scheme can be used as a critical gap filler in any sector of ST Development, priority is given to programmes such as infrastructure development (including electrification, roads, bridges, pathways), self-employment and skill development, water supply, sanitation, projects for IEC, vocational training and facilitation centers, micro enterprises and income generating activities, and admission of ST Students in international institutions..

Table 18 Outlay and expenditure under Corpus Fund from 2016-17 to 2018-19, Rs.in lakh

Year	Outlay	Expenditure
2016-17	5057.69	4754.41
2017-18	5079.00	5022.23
2018-19	5600.00	4054.77
2019-20	5800.00	3353.17
Total	21536.69	17184.58

(iii) Total electrification of ST colonies in the State

All the colonies including the remote ones were electrified and those colonies where laying of underground and aerial cables were not possible, solar electrification was done.

6. Other major achievements

(i) Socio –economic survey of tribals

For creating a database for planning, the ST Development Department initiated a socio-economic e-survey of tribals in 2018-19. This is one of the major initiatives taken by the Department to address a gap in planning process, that is, availability of data for formulating plans.

The survey was conducted by ST promoters. A startup firm under the Startup Mission provided the technical support for the survey. The firm trained the ST promoters to collect data from various settlements using android-based data recorders.

The socio-economic survey is comprehensive as it covers almost all the socio-economic fields such as population, education, healthcare, housing and other basic amenities, employment and unemployment, income, agricultural activities, other livelihood activities, drinking water facilities, electrification, health, and land ownership details. The survey information is based on individual households and settlements. In settlement based survey, general information regarding each settlements, details of Oorukoottams, Eco-Development Committee, Vana Samrakshana Samithi, and occupation of tribal people inside the forest area are collected.

The ST Department ensured that the survey process is carried out properly by monitoring the field level data collection, taking measures to minimise non-sampling errors, verification and correction, checks for non-coverage, scrutiny of filled in schedules, data processing, data tabulation, analysis of data, and preparation of reports.

The survey which covers 6881 settlements has been completed. The data will be updated every year.

As one of the main objectives of the survey is to provide the required data for micro level planning of Tribal Sub Plan by Local Governments, the data is also compiled local body wise

(ii) Attappady Alternative

Attappady Alternative is a brief report prepared by the Kerala State Planning Board. The report proposes short-and medium-term strategies for development and income growth among households in Attappady Block in Palakkad. Attappady is a tribal-dominated block in Palakkad district and a relatively less-developed region of the State. Of the total population of Attappady, 43 per cent are people of the Scheduled Tribes.

At the beginning of 2018, the State Planning Board initiated discussion of issues of under-development in Attappady and a review of existing reports on the subject. In February 2018, after the death of A. Madhu, a resident of Kadukumanna hamlet in Attappady and victim of a criminal attack, issues of underdevelopment and deprivation among people of the Scheduled Tribes in the area came back to public attention, and added urgency to the study.

This report (1) summarises the recommendations of diverse previous reports; (2) examines the allocation to Plan schemes that are applicable to Attappady; (3) summarises certain recent policy announcements of the Government of Kerala; and (4) draws conclusions from a study of incomes conducted by the State Planning Board among selected households in the region.

The findings and recommendations of the Report are as follows.

The Plan schemes by Government dealt primarily with welfare measures and direct assistance. These have played an important role in bringing relief to the people of Attappady, and must continue. Nevertheless, the present welfare approach to development in Attappady needs to be supplemented by an income-enhancement approach.

1. *Finding:* The most important correlate of household poverty was the remoteness of the village of residence.

Recommendation: The repair and modernisation of roads in Attappady is an urgent task.

2. *Finding:* Households with the most cultivable land are the poorest. The data indicate low coverage of schemes in agriculture and related activities.

Recommendation: The development strategy for agriculture in Attappady should be two-fold, one for the Attappady Farming Society, which controls 1,093 hectares of farmland, and another for household farming on homesteads.

The Attappady Farming Society has farms in four places. The details of the extent and crops cultivated in the farms are shown in the Table 22.

Table 22 *Attappady Farming Society, descriptive features of farm*, units in hectares

Units of Attappady Farming Society	Extent	Extent sown	Crops cultivated
Chindakki	283.44	283.44	Coffee, pepper, arecanut, and cardamom
Karuvara	141.47	141.47	
Pothupadi	377.8	377.8	
Varadamala	290	290	

As part of the Scheduled Tribe Development Department's initiative to promote income-bearing sustainable agriculture, it is currently implementing a scheme titled "Agriculture Income Initiative for Scheduled Tribes." The Annual Plan of 2019-20 proposed to promote high-value agriculture in farms in the Aralam Tribal Rehabilitation and Development Mission Area, Kannur, Cheengeri and neighbouring areas of Wayanad district, and Attappady in Palakkad district. The report recommends that the Department pursue the matter of preparation of Detailed Project Report.

Modern agriculture should be promoted on homesteads. The Kerala Agricultural University should be asked to develop a menu of homestead-based farming alternatives for tribal farming families.

An urgent and committed campaign to implement integrated programmes for the development of agriculture, animal resources, and fisheries must begin. Schemes to enhance incomes through forest and local produce must also be implemented.

It is suggested that the Scheduled Tribe Development Department and Collector call a small seminar of different departments and agencies (ST development, agriculture, animal resources, dairy development, fisheries, minor irrigation), experts from the relevant universities and elsewhere, and representatives of local bodies. The seminar should draw on the efforts and expertise of all the agencies mentioned above. The seminar should discuss, in a specific way,

plans for production and for marketing. The Government should try to begin alternative agricultural, animal husbandry, and fisheries initiatives in the coming season.

3. *Finding:* No person covered by the survey worked in the modern industrial or services sectors. Only two households received remittances from family members in other places.

Recommendation: A strong programme of employment-linked skill development for Attappady must be designed and implemented so that youth in Attappady get modern sector employment. The report suggests that our industrial agencies design programmes of industrial promotion, particularly in small industry, for Attappady. The Government should encourage high-tech, environment- friendly industry in the region.

In summary, income levels in Attappady can be transformed by:

- Roads;
- Specific high-productivity, high-income, and sustainable production-cum-marketing programmes in agriculture, animal resources and fisheries;
- Widespread, employment-linked skill development programmes; and
- A programme of support for investment in small-scale industry in Attappady.

Review of Government interventions

The approach of the Government had two strategies – welfare of the scheduled tribes and new employment and income opportunities for the persons. The welfare approach included providing decent housing to all persons of scheduled tribes. This was sought to be achieved through the LIFE Mission. In addition to this, the Government sought to extend public interventions in the fields of education, health, and skill development. Innovative approaches and incentives were introduced to reduce drop outs among STs. The local community was involved in providing these services thereby helping in generating new employment opportunities for the tribes. Agriculture activities were revived that provided food security as well as income to the farmers. Efforts were made to introduce modern and scientific agriculture practices. Health interventions were directed to focus on specific issues of malnutrition. Even in the midst of financial constraints, the Government maintained the allocation of funds for tribal sub-Plan at 2.83 per cent.

Challenges and way ahead

Despite all achievements, literacy rates are low among tribes, especially the most backward community among them (literacy rate is only 36.9 per cent among *Cholanaikkan* community). The rates of enrolment for higher education and professional courses are low. The problem of malnutrition among women and children still persists in some areas. There are issues of unemployment. A total of 2,103 tribal settlements have little access to health care institutions, and 26.67 per cent of tribal families lack road connectivity facilities.

The path to socio-economic development of Scheduled Tribes lies in the transition from low income jobs to high income occupations, to modern means of production, access to higher

education and research, high quality infrastructure, sustainable means of livelihood, skill training, modern agriculture and industrial production and integrated an approach for family-based micro plans for addressing the marginalized sections among tribals such as Adiyas, Paniyas, PVTGs and tribes living in forest.

There are substantial tracts of agricultural land that are under the direct control of either people of the Scheduled Tribes or the Scheduled Tribes Development Department. The Aralam Farm Corporation owns about 1466 hectares of farmland. There is approximately 1,093 acres of farmland under Attappady Farming Cooperative Society in Palakad District and 400 acres of farmland in the Cheengeri settlement in Wayanad. These tracts have abundant natural resources and vast potential for the development of agriculture and allied activities. If modern methods of agriculture and allied activities (for example, animal resources and inland fisheries, supported by minor irrigation) are introduced, new incomes can be created on a sustainable basis for the people of these areas.

CHAPTER 4.3

EMPOWERING THE ELDERLY, PERSONS WITH DISABILITIES AND TRANSGENDERS

The Approach Paper for the 13th Five Year Plan envisages the commitment to social security and investment– for the income poor, victims of social discrimination, transgenders, persons with disabilities, the economically vulnerable, the unemployed, elderly, the hungry and the sick. From 2018-19, the programmes on empowering the Elderly, People with Disabilities, Transgenders come under the purview of Directorate of Social Justice functioning as a separate Directorate in the Social Justice Department.

6. EMPOWERING THE ELDERLY

Aging is a global phenomenon, posing challenges for countries all over the world. While it presents a challenge in terms of increased demand for primary health care and long-term care, thus requiring a larger and better trained pool of care providers and age-friendly infrastructure, yet, these investments can enable older people to also contribute in many ways – whether it be within their family, to their local community (e.g. as volunteers or within the formal or informal workforce) or to society more broadly. The World Health Organisation has declared 2020-2030 as *The Decade of Healthy Ageing*.

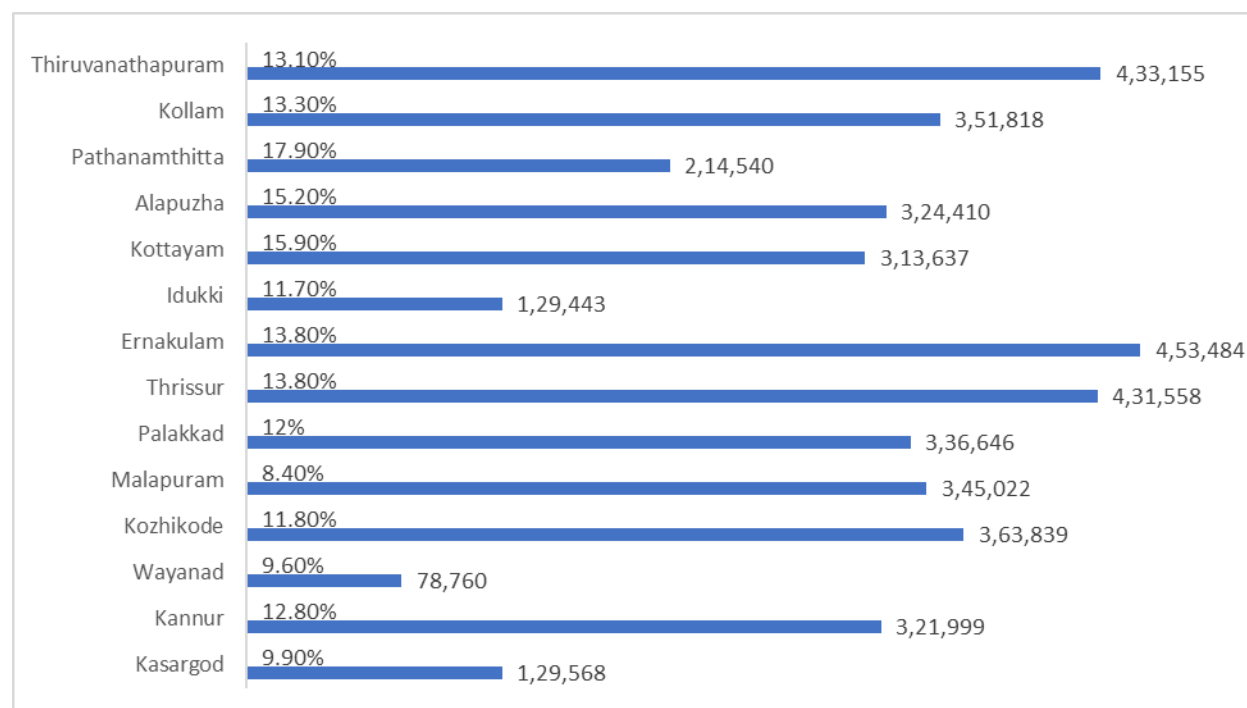
Kerala is rapidly aging. Its high levels of social development have resulted in low fertility rates, declining mortality, and increasing longevity. The proportion of elderly in the state has increased from 10.5% in 2001 to 12.6% in 2011 and is projected to rise to 23% by 2025 and 35% by 2050. The elderly must not merely live longer, but must be able to lead secure, dignified and productive lives. Besides the Constitutional provisions, the Maintenance and Welfare of Parents and Senior Citizens Act, 2007 was enacted in December 2007, to ensure need-based maintenance for parents and senior citizens and their welfare. Kerala has so far completed all the consequential steps under the Act, and it is being implemented in the state. Moreover, a strong social protection system is essential for the elderly population, if the state (and India) are to meet the 2030 agenda set by the Sustainable Development Goals (SDGs).

1) DEMOGRAPHIC PROFILE OF THE STATE

According to 2011 Census, there are 42 lakh people who are above 60 years of age in Kerala. Of these, 22 lakhs were females and 20 lakhs males. Figure 1 shows the distribution of 60+ at the district level in numbers and as a percentage of the district population. The proportion of population aged 60 years and above is slightly higher in rural areas than in urban areas. In 2011, 12.6 per cent of the population was above 60 years of age, the highest in the country, up from 10.5 per cent in 2001. By 2025, the proportion of the population above 60 is projected to be 23%, closer to current rates in OECD countries.¹⁰

¹⁰Census of India 2011, Population Projections For India And States 2011 – 2036, Report Of The Technical Group On Population Projections, November 2019 National Commission On Population Ministry Of Health and Family Welfare Nirman Bhawan, New Delhi – 110011

Figure 1: Number of Elderly by Percentage of Total District Population and Number Per District



Source: 2011 Census

Pathanamthitta district has the highest proportion of the elderly, followed by Kottayam and Alappuzha. It is noted, however, that the life expectancy in Kerala declines at the age of 60 years, particularly for men. Punjab has the highest life expectancy at the age of 60 for men (19.3 years) followed by Himachal Pradesh (18.3 years) and Kerala (18.0 years). For females, however, the highest life expectancy at age of 60 years is, 21.6 years (Kerala). (Elderly in India, CSO, 2016)

Twenty-six per cent of elderly men and eight per cent of women above 60 participate in the labour market (2013 UNFPA)¹¹. According to this report, workforce participation declines with age, but amongst the 80+, 8 per cent of men and 3 per cent of women continue to participate in the labour market. The report also finds that work participation rate is much higher among the poor and less educated elderly and among SC/ST elderly than those belonging to the educated and wealthier groups. A large majority of the elderly workers are self-employed, a smaller number are engaged as casual labourers, and a small share work in salaried positions.

The ratio of the dependent population to that of the working age population is defined as the dependency ratio. It is an important indicator of the economic burden carried by each worker in the state (a measure of the pressure on the working population and normally expressed as a percentage). In Kerala, the dependency ratio was the highest in the country at 19.6 (18.6 for men, and 20.6 for women) (Elderly in India 2016, Ministry of Statistics and Programme Implementation, GOI).

¹¹ UNFPA 2013 as cited in Table 1

There are also important gender issues among the elderly (Figure 2). While 88% of men above 60 are literate, only 72% of women are so. A larger percentage of women are fully dependent on others (70% in rural and 64% in urban) than men (43% in rural and 37% in urban)¹². Among the senior citizens, while only 8.8% of the men are widowed, about 57% of the women are so. Women outlive men by an average of 6 years, thereby the problems confronting them are exacerbated.

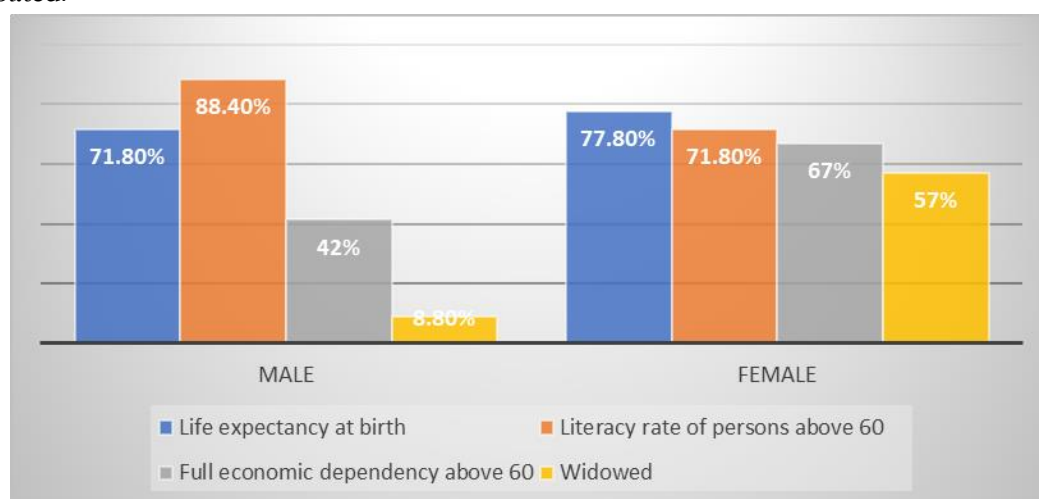
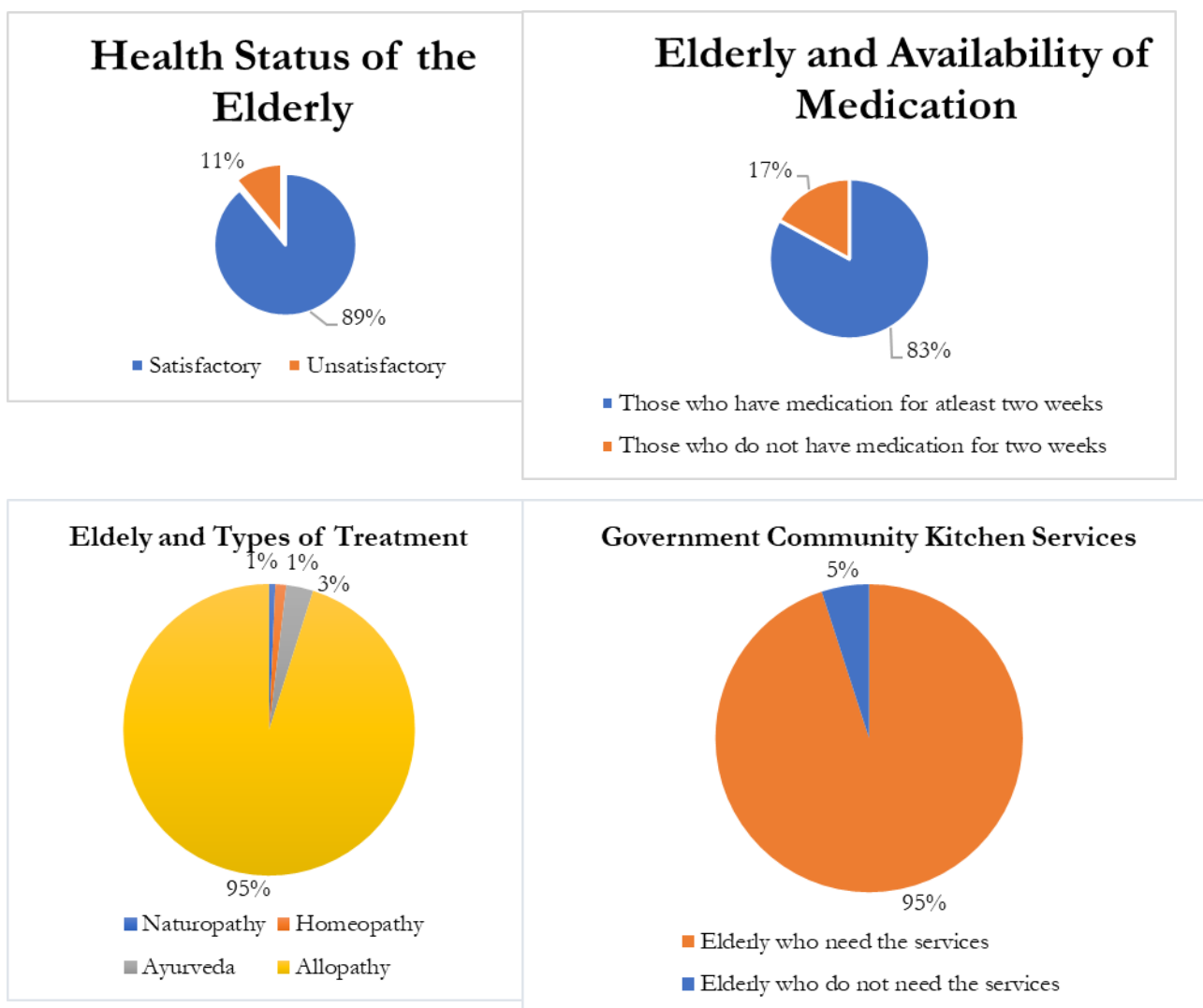


Figure 2: Gender Issues with Implications

A 2020 survey conducted by the Government of Kerala, where about 40.23 lakhs of elders responded, provides a most recent picture of the elderly in the state.¹³ Amongst the elderly respondents, 89 per cent self-reported their health status to be satisfactory while only 11 per cent considered it to be unsatisfactory. As much as 83 per cent of the respondents reported that they have medication for at least two weeks, only 17% did not. Ninety-five percent of the elderly felt they were getting a balanced diet; only five percent did not. A similar number (95%) did not need to rely on community kitchens for their diet; only 5% did. Most importantly, 99% of the respondents were aware of the preventive measures for COVID 19 (Figure 3)

¹² http://mospi.nic.in/sites/default/files/publication_reports/ElderlyinIndia_2016.pdf

¹³Survey on Health Status of the Senior Citizens in Kerala conducted by Women and Development Department, Government of Kerala from the responses received till 22 April 2020.



While only a smaller number of the elderly community participates in the labour markets, a much larger number make meaningful and significant contributions to household resources. While the percentage that contributes financially is relatively low, those who contribute to various household chores are significant (Table 1), and these remain invisible. More recently, in 2020, a quick survey of working mothers of Anganawadi children in two anaganwadi centres on how they managed work and child care before and after Covid-19 showed that *all* the mothers who were working (constituting roughly half of the number of AW children) had parents or in-laws staying with them or near them. In one AWC in which every child's father had a job in the Gulf, none of the mothers were working.¹⁴ This contribution of the elderly in terms of household help and care work should be strongly recognized.

¹⁴ Findings of an unpublished quick study done by Social Services division in the Planning Board in May 2020. Information on AWs supplied by WCD.

2). AGING AND ITS IMPLICATIONS FOR THE STATE

Population aging reflects the achievements of the state in improving the health status of its population. These demographic changes, however, pose some challenges for the state, its families and the elderly, as the number of elderly is on the rise, especially owing to the good health services in the state. This requires responsive and pre-emptive policies and measures to prepare the state for meeting the SDG 2030 agenda for social protection to support elders who are disadvantaged to live a life of dignity.

Table 1: Percentage of elderly by participation in various activities according to age in Kerala

Activities	Age Group			Total
	60-69	70-79	80+	
Care of Grandchildren	75.9	73.9	54.4	72.7
Cooking/cleaning	70	47.5	23.5	57.9
Shopping for Household	67.2	38.2	17.1	52.9
Payment of Bills	53.7	31.2	11.2	42.1
Advice to Children	89.6	82.4	61.8	84.1
Settling Disputes	91.2	81.8	56.1	84.2

Source: *The Status of Elderly in Kerala 2011 from the survey 'Building a Knowledge Base on Population Ageing in India (BKPAI)' by The United Nations Population Fund (UNFPA) issued on December 2013*

The implications of rapid aging will need to be met both at the macro (national) level and at micro (household) level. At the macro-level, it will increase the costs of an ageing population; while at the same time decrease the revenue through lower tax base and tax revenue. This shift will necessitate regular transfers to the elderly, with a higher proportion of taxes and social insurance contributions needed to pay social pensions and healthcare, in this highly budget-constrained context. At the micro-level, families have been, and to a great extent, continue to be, the primary source of care for the elderly. However, with migration, increased mobility, economic development and changing family patterns, the responsibility of elderly care is becoming a challenge. While the better off among the elderly can pay for market services, the poor are deeply vulnerable, and increasingly turning to the State for succour.

Health-Related Issues

The morbidity rate of Kerala's elderly is high at an estimated 65% (NSSO survey 2015), with increasing health expenditures. A 2017 study¹⁵ found that 35.5% of the elderly participants in

¹⁵2017. A Study on Health, Social and Economic Problems of Elderly Population in An Urban Setting Kerala. Dr Mini S S, Dr Anuja U, Journal of Medical Science And clinical Research. <https://dx.doi.org/10.18535/jmscr/v5i5.69>

the study had acute health problems for the previous one month. Eighty-one percent reported having at least one chronic problem and being on treatment, and 72 per cent having more than one chronic problem. According to the self-reported economic status, 42.2 per cent said they have a monthly income below 1000 rupees. Of them 69 per cent said their income is inadequate to meet their expenses, and 50 per cent depend on family members for their expenses. The main social problems identified were abuse by the family members (32 per cent), and quarrels with family members and neighbours (27 per cent).

The projected prevalence of dementia among elderly aged 65 years and above in Kerala was 1.5 lakh in 2011, according to the latest Dementia-India Report of Alzheimer's and Related Disorders Society of India (ARDSI). More women suffer from dementia than men, and they are at a greater disadvantage since they are likely to be more under the authority of their relatives or care takers, and are often isolated with restricted mobility. This leads to other issues including depression and amnesia.

Similarly, Kerala is reported to have a high prevalence rate of late-life depression¹⁶ with some studies estimating it could be as high as 55%. This has important public health implications for Kerala that need to be addressed at the primary basic health care facility.

Poverty and Economic Insecurity

Poverty and economic insecurity are issues for a sizeable group of the elderly. The high dependency ratio in the state combined with the low participation of elderly in the labour markets results in low economic security for elderly men, and more particularly for elderly women in the state (Table 2). They depend on family sources. All in all, many suffer from physical, emotional and financial problems towards the end of their lives. This affects the quality of health care received. The better-off elderly appear to have more faith in private hospitals and spend out-of-pocket on health expenses for effective treatment; those belonging to poor and marginalized groups prefer government hospitals, including the inmates of Old Age Homes.

Table 2: Percentage distribution of elderly by annual personal income by sex, Kerala 2011

Income (in Rupees)	Men	Women	Total
No income	25.3	50	39.6
≤12, 000	27.2	35.7	32.2
12,001–24,000	6.6	2.3	4.1
24,001–50,000	11.2	4.4	7.3
50,001 +	27.1	6.6	15.2

¹⁶<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4623644/> (2015)

Don't know/NA	2.6	1	1.7
Total	100	100	100
Mean	45,815	10,871	25,404
Number of Elderly	567	798	1,365

Source: The Status of Elderly in Kerala 2011 from the survey 'Building a Knowledge Base on Population Ageing in India (BKPAI)' by The United Nations Population Fund (UNFAP) issued on December 2013

A large chunk of the elderly depends on social security pensions provided by the government.

Overall Well-Being

Kerala has been praised for its high sex ratio and the longer lives that women live, but this also means that the elderly issue is predominantly a problem facing women. The sex ratio among the elderly (60+) is 1382, with the highest sex ratio in the age group 80 years and above at 1656 elderly women for 1000 elderly men (UNFPA et al 2013). This latter group needs special attention, suffering greater levels of loneliness, depression and dementia. Problems facing women remain to a great degree unaddressed in current policies.

An issue for the elderly is the neglect, abuse, and disrespect they face, despite the legislation to protect them. The exact numbers that face abuse in Kerala appears to vary but some studies suggest that the numbers are as high as 60% when one considers humiliation and emotional abuse, and that it is even higher among women who are above 80. Studies indicate that factors responsible for intentional humiliation include – dependency, poor financial status of family, and lack of space, interpersonal issues, chronic diseases of older persons, declining moral value system.

As stated earlier, the Government and other NGOs provide Old-Age Homes for elderly in Kerala. The state has the largest number of old age homes (around 600) in India but their standards of providing protection and care are highly uneven. Most of them are managed on custodial lines and take care of only the food and lodging of residents. It is important that the homes should be modernized and made resident-friendly as early as possible.¹⁷ The availability of reliable care workers is another significant concern. Currently, there are multiple service providers who supply care workers in a market, which is unregulated or without any oversight. Lack of sufficient data on the elderly is another constraint for policy makers. When it comes to planning, data is available on people belonging to the elderly age group; however, it is scattered and panchayats do not take this data into consideration while designing their programmes.¹⁸

3). ACHIEVEMENTS—WHAT HAS THE GOVERNMENT DONE SO FAR?

¹⁷ This information is from the Government of Kerala. Kerala State Planning Board. **Thirteenth Five-Year Plan (2017-2022). Working Group On Social Protection And Welfare Report.** Social Services Division.

¹⁸ Shri Vijayanand, Former Chief Secretary, Government of Kerala, at a Kudambashree hosted conference.

The Government has recognized this responsibility and has developed various programs to help the elderly poor. The Government has a two-pronged strategy. While there is programmes help to address the vulnerabilities that the elderly population faces, they also ensure that the elderly live better and healthier lives.

The programmes and schemes for senior citizens implemented through the Social Justice Department aim at their welfare and care by supporting old age homes, day care centres, mobile medicare units, etc. The Department also acts as the nodal agency for the effective implementation of the Maintenance and Welfare of Parents and Senior Citizens Act, 2007 in the State. Accordingly, maintenance tribunals are functioning for checking elder abuse and redressing the petitions of senior citizens in all the districts with RDO's as the Presiding Officers and District Collectors as Appellate Tribunal authorities. More recently many of the responsibilities are shared by Local Governments. These are briefly discussed below.

Social Pensions and Transfers to Provide Security to the Elders

Pensions for elderly are the most widespread form of social assistance in the world, and a key element of the Sustainable Development Goals 1.3. Today, the state pays non-contributory pension to approximately 48 lakh beneficiaries' fewer than five categories, this has almost doubled from 27.6 lakh beneficiaries in 2014-2015¹⁹.

The state offers five types of welfare pensions to eligible persons above the age of 60 and having a family annual income of or less than Rs.10,000. These are:

- A. Agricultural pension (Rs 1,200 per month) to a person who is a member of the Kerala Agricultural Workers Welfare Fund.
- B. Old age pension: The Indira Gandhi national old-age pension scheme (Rs 1,500 pm) to a destitute person.
- C. Indira Gandhi national disability pension scheme for "mentally challenged" (Rs 1,200 pm), Indira Gandhi national disability pension scheme where physical disability is more than 80% (Rs 1,300 pm),
- D. Pension for unmarried women above 50 years (Rs 1,200 pm) and
- E. Indira Gandhi national widow pension scheme (Rs 1,200 pm).²⁰

As a part of decentralization, the implementation of these pensions has been transferred from the Revenue Department to Local Self Government Institutions, which are entrusted with the task of receiving the application, processing, granting and distribution of the pension.

Other transfers under some specific programs are described below:

¹⁹https://saiindia.gov.in/sites/default/files/audit_report_files/Kerala%20_Report%20_6%20_2016%20_PA%20_of%20_Social%20_Security%20_Pension%20_Schemes.pdf

²⁰ These numbers were obtained from the Government webpage.

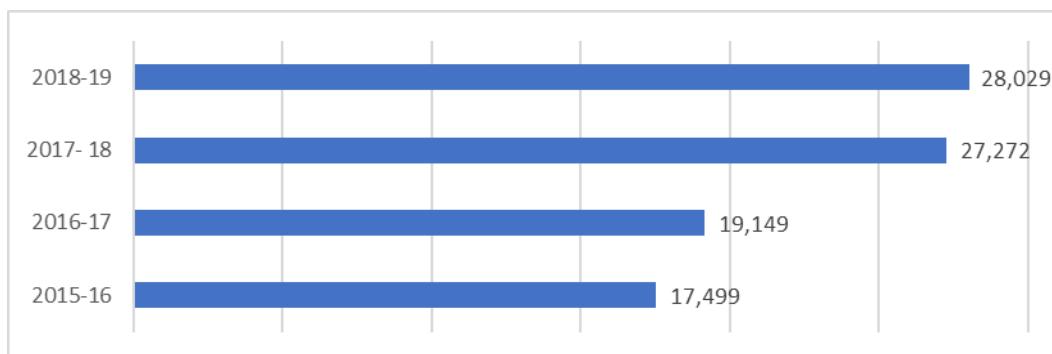
A. Aswasakiranam: This scheme provides financial support to bedridden and intellectually disabled patients, their families and primary caregivers. A monthly assistance of ₹ 525 is being provided under the scheme to caregivers of all bedridden patients who need a full-time care. At present, about 1,30,000 beneficiaries are receiving assistance under the scheme of which about 42,000 are reported to be elderly. The scheme has reached out to a lot of elderly women.

B. Snehapoorvam: This is a new initiative that provides financial support to orphans or those who have lost one parent and are living with the support of their family. Elderly grandparents, who are often the caregivers, receive financial assistance for the education of such children, ranging from ₹ 300 per month (for primary school goers) to ₹ 1000 per month (for undergrad students). In Kerala, since the rate of family disintegration is on the rise, the burden of childcare frequently falls on old women and hence this scheme has special significance for them²¹.

Welfare Homes for the Elderly

Sixteen Government Old Age Homes are functioning under the Social Justice Department in Kerala. Recently, 11 Homes were transferred to Local Self Governments and funds are also being routed through Local Self Government. Under the Orphanages and Other Charitable Homes Act, 1960, 620 Old Age homes are registered in Kerala. The number of inmates in the old age homes (under Social Justice Department and Registered Welfare Institutions) has increased significantly between 2015 and 2019 (Figure 4).

Figure 4: No of Residents in OAHs increased significantly over last four years



Health Care

Snehittha, a ‘calling-bell’ scheme is a recent innovation, which comprised the formation of 25,000 elderly neighbourhood groups under the aegis of Kudumbashree. It was also formulated for elderly people living alone.

²¹ Data is not captured segregated by age,

Kerala implemented *PM-JAY/Karunya Arogya Suraksha Padbathi* (KASP) from April 2019. Within a span of only five months, 100 per cent of the families were enrolled, i.e. at least one member of each family had received PM-JAY/KASP card. As of now, more than 55 lakh e-Cards have been generated. After the first round of enrolment, the team focused on left out families to achieve 100 per cent family enrolment (Table 5). These enrolment drives include tribals, destitute, old age homes/orphanages, mobile enrolment, etc. **The NHA has highlighted the Kerala state as one of best practices and Innovations.**

Table 3: *Details of the PMJAY-KASP beneficiaries*

Number of PM-JAY eligible families as per SECC/RSBY data	2,187,933
Number of PM-JAY additional families covered by the State	19,40,393
Number of candidates above 50	14,35.897

Source: https://pmjay.gov.in/kerala_profile, and the State Health Agency (SHA), Kerala. SHA does not capture the data of people above 60. The specific data is available on request only with National Health Authority, Delhi.

Vayomithram programme was initiated through Kerala Social Security Mission in six Municipal Corporations and 85 Municipalities and one block of all the 14 Districts. In 2019-20, 2,69,416 persons benefitted. A help desk provides general support and information. This project is being extended to all Block Panchayats in the State, developing a Vayomithram unit in each Block. Under this programme, ‘Ayurmithram’ a new initiative for providing ayurvedic treatment to the elderly in six corporations is being implemented.

Vayomrutham is being implemented through Social Justice Department with the support of Department of Indian System of Medicine in Government Old Age Homes. It is mainly for the treatment of inmates who are suffering from various old age related health problems such as diabetes, asthma, skin diseases, arthritis etc. So far, 786 inmates from various government old age homes have been provided with Ayurveda treatment for the year 2018-2019.

Mandahasam, started in 2018-19, aims to give free set of teeth for senior citizens under BPL category. The department has a list of dental colleges and dental treatment centres from where the beneficiaries could avail the treatment. The beneficiaries are entitled for a financial assistance of maximum ₹5,000 for fixing the teeth. The number of beneficiaries covered under this scheme in 2018-2019 is 1301.

Well-being of the Elderly

Sayamprabha, another initiative by Social Justice Department collaborating with Local Self Governments provides day-care facilities and other welfare activities which include yoga classes, meditation classes etc. There are 82-day care centres running as Sayamprabha Homes of which two centres are functioning as Model Sayamprabha Homes (Multi Service Day Care Center for

Elderly). These day care facilities offer opportunity for the senior citizens to mingle with their own age group and provide solace and comfort to each other.

The *Second Innings Home* project intends to turn Government old Age Homes into Second Innings homes as model state of the art, multi-service community age care to improve the quality of life of senior citizens by providing basic amenities like shelter, food, medical care and entertainment. The pilot project started in Kannur district by developing the Government Old Age Home Kannur as a model Second Innings home.

The 2019-20 Budget also continues support to establishing self-supporting Old Age Homes / Paid Old age homes and Post-retirement homes for the elderly.

Kerala Police *Janamaitthri Suraksha*: Initiated in 2008 with 20 select police stations, Janamaitthri has now expanded to 248 stations across the 14 districts. It is a unique concept of community policing whereby the state joins hands with the citizens in crime prevention. One component of this scheme is the protection of senior citizens. The police help to monitor senior citizens by interacting with them on the phone, visiting them regularly, organizing field visits and advising them on their personal problems. This one-to-one interaction with the police is especially beneficial for elderly women, since a large number of them are living alone and are unable to go to the police station to register their complaints. Recently, they have also initiated 'Prashanthi' a helpline exclusively for old age citizens. The main aim of the project is to provide psychological assistance, the purchase of groceries, medicines, apply for vehicle pass and hospital facilities to the needy during the Covid-19 pandemic. The number of elderly who got benefits under this helpline within three months of its implementation is 2097.

Based on the concept 'Neighborhood Network in Palliative care', Kerala has an extensive network of community-owned palliative care programs, mostly availed of by very old persons during the final stages of their lives. There is no central repository maintained for the number of units and the beneficiaries. The number of community owned palliative care clinics in Kerala is 387 (Table 6). In addition, as per the Palliative Care Policy issued by Government of Kerala, 2008, palliative care is integrated into the primary health care services. The number of Government-run Palliative Care Units is 1322, and the total number of elderly (above 60 age) covered under the community owned and government-run palliative care clinics are 1,15,130.²²

Table 4: Details of Palliative care units in Kerala				
Sl. No.	District	Government run palliative care clinics	Community based palliative care clinics	No of beneficiaries above 60 Age
1	Thiruvananthapuram	123	13	14000
2	Kollam	103	21	13119

²²There can be common patients in community owned and government run palliative care clinics. The data is captured from the Palliative Care Project- State Resource Centre and Coordinating Unit, National Health Mission.

3	Pathanamthitta	NA	NA	NA
4	Kottayam	109	20	8743
5	Alappuza	97	10	10340
6	Idukki	72	6	6870
7	Eranakulam	154	35	10000
8	Palakkad	125	10	7356
9	Thrissur	134	32	12000
10	Malappuram	138	92	11652
11	Kozhikode	81	65	7500
12	Wayanad	38	18	2990
13	Kannur	94	50	6510
14	Kasaragod	54	15	4050
	<i>Total Number</i>	<i>1322</i>	<i>387</i>	<i>115130</i>

Source: Information obtained on phone from each centre

Vayo Soubruda Grama Panchayat: This is a scheme implemented by Social Justice Department of Kerala under the State Old Age Policy, 2013 for transforming all Panchayats in the State into old-age friendly Panchayats. The 'Vayo Souhruda' Panchayat project is being implemented with the assistance of the Centre for Gerontological Studies (CGS), a voluntary organization located in Thiruvananthapuram. A project for elderly is also under implementation in Alappad (Box 1). The main objective of the programme is to improve the quality of life of the senior citizens in the state through ensuring their good health and participation in different activities. The panchayats that are made old-age friendly are: Manikkal, Poovachal and Vembayam grama panchayats in Thiruvananthapuram District and Karimba, Peruvembu, Mundoor and Puthussery grama panchayats in Palakkad District. A Steering Committee looks after its implementation, consisting of the Panchayat President as Chairperson and ICDS Supervisor as Convener. Vayojana Sabhas are constituted in each ward with the Ward Member as Chair and Anganwadi Teacher as Convener. There is an apex body of these Sabhas, the Vayojana Council with the Panchayat President as Chair and ICDS Supervisor as Convener. The recommendations of these bodies are presented to the Panchayat Council for action. The PHC, PWD, Police and Schools are brought into the picture to work along age-friendly lines. Sensitizing all government and non-governmental agencies is also included as a mandatory step in the operation.²³

²³<https://www.deccanchronicle.com/nation/in-other-news/290517/kerala-six-villages-to-be-declared-old-age-friendly.html#:~:text=The%20panchayats%20that%20will%20be,and%20Puthussery%20panchayats%20in%20Palakkad.>

Box 1: Transforming Alappad Grama Panchayat – An Ongoing Community Effort

Alappad is a coastal village in the southern part of Kerala. Situated in Kollam district, it was also one of the worst affected places in the 2004 Tsunami. *Transforming Alappad Panchayat* was an ambitious project initiated by the Alappad local self-government, as part of converting their panchayat into an 'Age Friendly Panchayat'. As part of the project, special care plans were devised for the elderly population of the village. This project was also supported by the Dept of Community Medicine, Amrita Institute of Medical Sciences, Kochi.

Initially, with the help of the local ASHA workers, a survey was conducted to assess the service needs among the elderly population of the village. Information regarding their existing health status, trend of health seeking behaviour and even their psychological status were collected. Following this, the results were analysed and further care plans were developed.

One of the main suggestions was to provide *minimum levels of care to every individual above the age of 70 years*. This included various aspects such as assessment for various chronic diseases, bowel & bladder disturbances (commonly seen in elderly), providing health education on the danger signs of cancer, screening for risk of falls etc. Special care for bedridden patients were also devised, with separate plans made for each gender.

In addition, an *integrated care programme was developed for individuals between 60 – 70 years old*. This again covered most of the chronic diseases commonly seen in the population. This was to be integrated with the already existing programme in the community known as '*Kadalora Koottayma*'.

An *exclusive programme was devised for the elderly women* in the village, taking into consideration the health issues that are commonly seen in women, such as osteoarthritis, Urinary incontinence, prolapse etc.

Another suggestion that came up in the discussions was development of *neighbourhood self-help groups* comprising of the young-old population. Apart from tackling loneliness and boredom, this can also be a source of income for the elderly members. For example, some of the members can be trained in providing service to other elderly members with reduced mobility.

Development of '*public spheres*' was another idea presented, where certain areas in the panchayath could be converted into a meeting place for the elderly members to socialise. *Modifying the existing infrastructure* in the panchayath to make it elderly-friendly was another plan that was developed. Also, idea to provide *retrofitting* in the homes of the elderly was also planned. A plan was also made to develop *kitchen/herb gardens* in the homes of the elderly individuals. Another decision was to strengthen the existing '*Meal programme*' in the community to ensure that no elderly goes hungry in the community.

Source: Dr K Vijayakumar (Professor & HOD and Dr, Biju Menon, Dept of Community Medicine, Amrita Institute of Medical Sciences.

Subsidized Fares for Travel on Government Transport: The Kerala State Road Transport Corporation (KSRTC) offers reservation of 20% seats in ordinary bus services and in limited stop ordinary bus services for senior citizens. In the fast passenger buses, eight seats are reserved for senior citizens out of whom four are for elderly women. Rail travel has concessionary rates for senior citizens. Males above the age of 60, and females above the age of 58 are eligible for 40% and 50% concession in the rail fares, respectively. This is available on fares of all classes of Mail/Express/Rajdhani/Shatabdi/Jan Shatabdi/Duranto trains.²⁴

5. A VISION FOR KERALA 2050

These pressing challenges of today, exacerbated by the COVID-19 crisis, cannot be met by merely expanding the present systems, infrastructure and facilities. There is need for a new forward-looking approach and vision, one that will perceive elders not just as a vulnerable group who need protection, but also as a group with great potential to contribute to the socio-economic development of the community.

The decade 2020-2030 has been declared the decade of healthy aging by WHO—a decade of concerted and sustained collaboration to foster Healthy Ageing and to shift population ageing from a challenge to an opportunity. Healthy ageing involves a process whereby the elderly person can remain as productive to members of society ensuring their physical, social and mental well-being. The Global strategy on ageing and health (2016-2030) supports multi-sectoral action for a life course approach to healthy ageing, and calls for transformative change that would foster longer and healthier lives. This requires mainstreaming of issues concerning the elderly into the objectives and plans of all sectors.

FRAMEWORK FOR A NEW ELDERLY POLICY

The State Government should consider revising its current policy and include a policy and institutional framework to address the challenges of rapid population ageing. The policy should establish a **clear rights-based conceptual framework**, vision, purpose, and outcomes, enabling the elderly to live healthy, empowered, and valued lives, supported by an care system that provides a basic standard set of quality services to the elderly on an equitable basis and per need.

The policy should take a life course approach, recognizing that old age is the culmination of life-long practices and that aging is a result of choices and behaviours throughout life. It should prepare for the future generations of the elderly (middle-aged working individuals of today) and guide them to avoid replicating the pitfalls faced by the current seniors. This should be an important part of the policy's vision.

²⁴<https://economictimes.indiatimes.com/wealth/plan/here-are-all-the-benefits-available-to-senior-citizens/ticshow/58655579.cms>

The potential of elders to contribute to society is significant.²⁵ The policy should make a paradigm shift from the traditional approach of social policies where older people are seen as receivers of help and those in need. Instead the policy should be based on the principle that the elderly can and should contribute to the development of society.

Consultation with the elderly and other stakeholders is essential. This will need the involvement of multiple institutions and require coordination among the departments. It will also mean significant consultation with the elderly as well as today's working-age individuals who will constitute the elderly of tomorrow. Feedback from such consultation should help to inform the formulation of the Elderly Policy.

It is proposed that the Policy be based on a three-tier system with home-based care as the first option, community-based care second, and institution-based care as the last. Local Governments should explore and encourage suitable models of assisted living facilities that will allow the elderly to live independently but with limited supervision and care, coordinate services by outside health care providers; and monitor resident activities to help ensure their health, safety, and well-being. Such assistance can include the administration or supervision of medical needs, and provision of personal care services.

Local Governments will play a central role in implementing the policy. The Policy should take a multi-sectoral approach with strong engagement from diverse sectors and different levels of government as noted in WHO's Global strategy and action plan on ageing and health. It will tie together the various responsibilities for elderly care shared by different tiers and sectors of government into a cohesive and consolidated vision. In FY20-2021, Local Self Governments, for example, are bound to set apart at least ₹290 crore from their plan fund for elderly people to be included in the local plan for 2020-21. Further, given the nature of aged care systems, cross-sectoral coordination between relevant government agencies becomes central to the effective implementation of this vision.

The policy should define a basic set of standard multi-sectoral services available to the elderly at different stages. The policy should recognize that the elderly are not a homogeneous group. Their needs differ as they grow older, and the policy should ensure different packages that will meet the varying needs. The policy should ensure coordination between aged care and medical care, essential to prevent duplication and provide a continuum of services.

Strong partnerships are essential; the state cannot do it alone especially with the burgeoning number of elders. The Policy should ensure a role not only for the different government institutions but also a clear role for community-based organisations, NGOs, and the private sector. The policy should guide on how to form effective partnerships and

²⁵ In the United Kingdom, the contributions of older persons through taxation, consumer spending and other economically valuable activities such as social care provision and volunteering were estimated to be worth nearly GBP 40 billion in 2010, which is more than expenditure on them through pensions, welfare and health care combined, and this number is set to rise to GBP 77 billion by 2030 (Cook 2011).
https://www.un.org/development/desa/ageing/wp-content/uploads/sites/24/2017/07/UNDP_AARP_HelpAge_International_AgeingOlderpersons-and-2030-Agenda-2.pdf

contractual/partnership arrangements with hospitals and stakeholders for service provision, training, and technical support.

Significant capacity strengthening would be needed to translate the more complex cross-sectoral aged care system into a reality. Through a needs assessment, the Government should identify the capacity gaps in knowledge and skills, and define a basic service package, and training and human resource development to develop necessary capacity and knowledge for those engaged in the management, delivery and monitoring of aged care services.

The policy should take a special note of issues related to women and people from disadvantaged communities. Women constitute the majority of the elderly. Elderly from tribal and SC backgrounds are particularly disadvantaged economically and socially. There should be a clear focus on these groups and any action plans should be responsive to their needs and priorities. The Policy should pay special attention to the needs and problems of the old and oldest old (80+) as their issues are different from those of the other sections of the elderly.

The Government should also consider how to **create sufficient fiscal space** to meet the burgeoning social security payments that will be needed for the elderly. Innovative measures will need to be considered and planned to ensure security for the elders.

Finally, the policy should result in **a clear forward-looking and strategic multisector State framework for action**, a long-term plan for 2020-2050, a medium-term plan for 2020-2030, and short-term plan for 2020-2025. The framework should be prepared by a multi-sectoral working group consisting of key departments. It should be implemented by different agencies depending on the area. This can help to increase efficiencies and avoid duplications.

At the local levels, **local governments should develop and formulate local-level action** plans for the elderly within the overall framework provided by the State Framework for action, which should be adapted to the needs of the aging population in the panchayat.

An Advisory Committee (AC) could be appointed for the purpose of overseeing the promotion, implementation, monitoring and evaluation of the State Policy for Older Persons. The AC could consist of members representing the elderly group, Government, non-governmental and private sector organizations, transparently selected based on well-defined criteria. The AC could also set up a Working Group to ensure coordination among the various governmental Departments.

II. Empowering Persons with Disabilities

The UN Convention on the Rights of Persons with Disabilities (UNCPRD) 2013 is the first international, legally binding instrument, setting minimum standards for rights of people with

disabilities.²⁶ An estimated 15% of the world's population lives with some form of disability, of whom 2-4% experience significant difficulties in functioning (WHO 2011). The global commitment for the 2030 Agenda for Sustainable Development recognizes the promotion of the rights, perspectives and well-being of persons with disabilities in line with the CRPD towards a more sustainable and inclusive world (UN 2019)²⁷. Disability was referenced in five goals related to education, growth and employment, inequality, accessibility of human settlements, as well as data collection and monitoring of Sustainable Development Goals (SDGs).

1. Overview of Disability in Kerala

In 2015, Kerala Social Security Mission (KSSM) conducted an exclusive survey of Persons with Disabilities (PwDs) in Kerala, which was one of the first surveys of its kind in India, covering 22 types of disabilities, excluding acid attack victims and Parkinson's disease (included in the Rights of Persons with Disabilities (RPwD) Act, 2016) and including Kyphosis and Epilepsy as separate disabilities.²⁸ Appendix 1 and 2 give macro data by disabilities while we spell out some of its major findings:

Demographic characteristics of PwDs: The survey identified 793,937 persons with disabilities in Kerala constituting 2.3 percent of the state's population, 55.3%, was male and very few were transgenders (0.015%). The highest percentage of PwDs was from Malappuram District (12.2 %) and lowest were from Wayanad and Idukki districts (2.9% or and 3.3%). Age-wise, almost 41 percent were in the age group of 35-59 years and 16.5% were children. Notably, more than half, almost 52% of PwDs did not have a disability certificate and among those who did, 2.8 % had 1-40% disability while 36.7% had 40-79% disability and 8.6% had 80-100% disability. Among all the PwDs, 51.5% were married and 2.5% were either divorced or separated from their spouses. Further, 0.8 percent PwDs were bed-ridden.

About half the PwDs either did not go to school or dropped out in primary school. In the working age group 20-59 years, about 37 per cent were employed, majority were daily wage or temporary workers. Only 3.7 per cent were in the public sector. An even lower percentage 2.9 per cent, were permanently employed.

Types of disabilities: The major disability identified among male, female and transgender was Locomotor Disability (32.89%) and the least prevalent were Multiple Sclerosis (0.06%) and

²⁶ United Nations (2019A):Convention on the Rights of Persons with Disabilities
<https://www.un.org/development/desa/disabilities/resources/general-assembly/convention-on-the-rights-of-persons-with-disabilities-ares61106.html>.

²⁷ United Nations (2019B):Sustainable Development Goals
<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

²⁸ Based on Census 2011, Kerala had 761,843 persons with disabilities. Among them 171,630 had disability in movement (22.5 percent), 115,513 had disability in seeing (15.2), and 105,366 had disability in hearing (13.80). There were 120,457 Children with Disabilities (CwDs),15 percent and 414,788 PwDs belonging to the age group of 30-59 years, 54.4 percent (Census India, 2011).

Thalassimia (0.07%). Multiple disability except deaf-blindness contributed 17.31% while deaf-blindness was found in 0.11%, mental illness in 12.72% and intellectual disability in 8.68% of total disabled persons.

Causes of disability: An interesting feature of the survey was that a higher proportion, ie, 57 per cent of PwD had acquired-disability (as against congenital) and the factors that led to disability included childhood illness (12.0 per cent), burns (0.6 per cent), accidents – (10.7 per cent), and head injury (2.0 per cent). Among all PwD, 42.9 per cent (340,341) were born as disabled (Cerebral Palsy, Intellectual Disability, Autism Spectrum Disorder, Locomotor Disorder, hearing Impairment, Multiple Disability etc).

2. State Initiatives for PwDs

Kerala is one of the leading states in the country when it comes to services offered to PwDs (Newzhook, 2019).²⁹ From 2018-19, the Directorate of Social Justice is functioning as a separate Directorate focussing its activities on the Elderly, Disabled, Transgenders, Destitutes and Probationers. The State Planning Board shares the view that it is “the responsibility and duty of the government and society to create an environment where the disabled can exercise equal rights, develop their talents and live with dignity.” During the XIII Five-Year Plan period, allocations are being provided to ensure the disabled access to public buildings in all districts of the State; reach out to organisations of persons with disabilities and to others working in this sphere to design programmes that enhance the all-round capabilities of persons with disabilities. There is need for prevention initiatives, early screening, early intervention through District Early Intervention Centres (DEICs), education support through special anganwadis, model child-rehabilitation centres, special schools, integrated schooling, vocational training, work centres for persons with disabilities, community-based rehabilitation, and assisted-living projects.

Directorate of Social Justice

Through the various organisations under the Social Justice Directorate, the Government has implemented development programmes for disabled people, starting from creating awareness. These organisations/agencies include the National Institute of Speech and Hearing (NISH), Kerala Social Security Mission (KSSM), Kerala State Handicapped Persons Welfare Corporation (KSHPWC), National Institute of Physical Medicine and Rehabilitation (NIPMR), State Commissionerate of Persons with Disabilities (SCPwD), among others.

Awareness: Substantial emphasis has been put on generating greater awareness regarding people with disabilities since 2017-18, reducing stigma and prejudices attached with disability. Amma Care and Amma Teacher under State Commissionerate for Persons with Disability (SCPwD) and NISH Interactive Disability Awareness Seminars (NIDAS) are examples. The Kerala State Physically Handicapped Persons Welfare Corporation also implements disability awareness as part of *Subhayathra* scheme. In addition, the

²⁹ Newzhook, 2019. <https://newzhook.com/story/kerala-government-gets-award-for-empowering-disabled-people-gets-mixed-reviews-from-activists/>

Directorate celebrates World Disability Day to promote awareness and understanding about the issue and mobilises support for giving rights to PwDs.

Life Cycle Approach: The scheme *ANUYATHRA*, launched in 2017-18, a Rights Based Life Cycle Approach in disability management implemented by KSSM, is designed as an umbrella program, crafted in line with the RPWD Act 2016 to revamp the earlier State Initiative on Disabilities. This includes prevention initiatives, early screening, early intervention through District Early Intervention Centres (DEICs) and other health and social sector institutions, education support through special anganwadis, Buds Schools, Model Child Rehabilitation Centres, Special Schools, inclusive education and vocational training, Community based rehabilitation and assisted living projects among others. While schools admit students with disabilities, appropriate mechanisms have to be put in place to make them inclusive. Teachers, in general, need to be sensitised to the needs of such students. Special education training needs to be more practice-based like nursing training attached to hospitals. Special attention should be given to cognitive disability. Diversity in cognitive disability should be emphasised. Individual care Plan formulation and follow-up is another major initiative. This requires convergence of services, resources and institutions. Every year 5-6 lakh children benefit from this scheme (Economic Review 2016 to 2019).

“*Spectrum*” project, a component of *ANUYATHRA*, initiated during the 13th Plan aimed at early detection of autism, providing a parental empowering program and skill development of the autism-affected children. As part of this project, autism centres are established at six Medical Colleges with the service of a physiotherapist, clinical psychologist, occupational therapist, speech therapist and other specialised doctors. In addition, a regional autism rehabilitation and research centre has started at National Institute of Physical Medicine and Rehabilitation (NIPMR).

Another component of *ANUYATHRA* is the life approach campaign in Hearing Disability Management named *Kathoram*. Cochlear Implantation and auditory verbal habilitation of children 0-5 years is done under *Sruthitharangam*. The *ANUYATHRA* Help Desk, through a toll free number, replies to queries, details of institutions and services for PwDs.

A very innovative project under *ANUYATHRA* initiated in 2017 to increase awareness is M-Power, implemented by the KSSM under which twenty three intellectually disabled children were trained in magic at the Magic Academy (run by G Muthukad) and after three months performed faultlessly in front of Dr. Hamid Ansari, former Vice-President of India who launched M-Power in June 2017. They were envisaged as the brand *ambassadors* of the campaign for spreading awareness about PwD.

Rehabilitation Schemes: *Athijeevanam* is an umbrella scheme for the development and rehabilitation of Persons with Disabilities implemented in the 13th Plan. The *Dementia* home provides the rehabilitation of 15-23 Dementia patients every year (Economic Review, 2019). *Pratheeksha* scheme is for the rehabilitation of intellectually disabled persons. A central scheme, *Deendayal Disabled Rehabilitation Scheme (DDRS)* provided financial assistance to voluntary organizations to make available the whole range of services necessary for rehabilitation of persons with disabilities; however, funds from the Centre have stopped now and state has stepped in. In

addition, there are 15 *welfare institutions, (including vocational training centres)* under the aegis of Social Justice Department (SJD) for the care, protection and rehabilitation of disabled and senior citizens (Economic Review, 2019).

Disability Certificate: A *disability certificate* is necessary to access benefits afforded under the Rights of Persons with Disabilities Act (2016) in India. As a component of ANUYATHRA, Disability Cards are distributed through *Disability Certification Camps*.

Scholarships / Educational Support: There are seven schemes to support students with disability, from school level to degree/PG/professional/technical training courses (250-400 PwDs/year). Some of these are

Vidyakiranam: Educational assistance to children of disabled parents, whose beneficiaries nearly doubled in 2018-19 (3957) compared to 2017-18 (2013).

Vidyajyothi: Financial aid for uniforms and study materials to PH (physically handicapped) students. Every year an average of 1000-1500 children benefit from this scheme. *Assistance to write equivalency exams to disabled persons.*

Vijayamritham - Cash award for meritorious children with disabilities (CWDs) (Economic Review, 2016 to 2019).

Sabachari As part of promoting inclusive education, a new scheme was designed for honouring the NSS and NCC units of schools that supports PwD children.

Employment and Skill Training: In the 13th Plan attempts have been made to enhance provision for self-employment. The recently announced 100 days programme of the government has a provision for giving self employment loans to 7749 persons registered with the Employment Exchanges (of whom 2708 are women beneficiaries) in a collaborative project of KSHPPWC and Labour department under the *Kaivalya* scheme of the latter. Financial assistance is given to lottery agents with disabilities as a subsidy. There is another scheme that gives *Financial Assistance to five Blind and Orthopedically Handicapped Advocates* per year. *Swasraya* is a scheme which provides financial assistance to 100-300 single mothers of Physically Handicapped /Intellectually Disabled persons (every year) which will enable them to find self-employment (Economic Review, 2019).

As a follow-up to the magic training to ID children and employment of six of them in the Magic Planet to perform magic, the latter in association with KSSM, City Corporation and K-Disc, has set up a Different Arts Centre (DAC) in the campus, a proud initiative of the government. The centre is functioning as a platform to engage and empower 100 children with autistic disorders (M-Power incubator) by showcasing their talents in music, dance, painting and skills in various musical instruments. Art therapy could play a significant role in bringing positive changes among such children.

Technological Support: The *Young Innovators Programme* (YIP) in 2019, part of K-DISC's societal advancement component, has a module called Innovation by Youth with Disabilities (I-YwD) to identify and promote children with different abilities. The support of international agencies and agencies working in the field of disability is enlisted. The programme is organised jointly with United Nations Educational, Scientific and Cultural Organization (UNESCO), Score Foundation, Disability Arts International and National Institute of Speech and Hearing (NISH).

Financial Assistance: Distress Relief Fund for the disabled provides financial assistance for medical treatment, including surgery, to persons who become handicapped due to accidents, and for any other purpose which is not covered by existing schemes. The *Pariraksha* scheme provides financial assistance for PwDs who are in a crisis or facing emergency situations. Around 1000 PwDs are benefiting from this scheme every year. The scheme *Parinayam* provides marriage assistance to physically handicapped girls and the daughters of physically handicapped parents. It has been revamped to give assistance to those who marry PwD (500-800 beneficiaries per year). .

Accessibility/ Assistive Devices: Matru Jyothi is a financial assistance scheme for visually impaired mothers. The scheme provides assistive devices to 50-100 PwDs every year . *Barrier Free Kerala* is another project which aims to make Kerala a Barrier Free State. *Subbayathra* and *Thanal* are other two schemes of Kerala State Physically Handicapped Persons Welfare Corporation. These schemes provide free distribution of aids and appliances, modern equipment and appliances like hightech limb, electric wheelchair & laptop with voice enhanced software, powered bed and other modern equipment for specific needs of people with disability.

Social Assistance: Aswasakiranam scheme provides an amount of Rs. 525/- as assistance to care givers, primarily women (family members) of bedridden Physically Handicapped /Intellectually Disabled persons.

Other Financial Assistances: Disability itself demands additional resources to achieve a reasonable standard of living. Thus KSSM runs two schemes; a. *Samaswasam*, which provides financial assistance to persons with Haemophilia and Sick cell anaemia; and b. *Thalolam*, which covers treatment (free) for children below age of 18, suffering from Cerebral Palsy, Brittle Bone Disease, Hemophilia, Thalassemia, Sick Cell Anemia, Orthopedic deformities and other Neurodevelopmental Disabilities, Congenital anomalies (Endosulfan victims) and accident cases (needing surgical intervention). An average of 13,000-20,000 children are benefiting from this scheme every year.

Table 1:Major Schemes and Beneficiaries of SJD

Sl.No.	Name of the Scheme	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
1	Subhayathra	1658	1445	1659	*	1898	*
2	Kathoram (Universal Hearing Screening)	104,268	96,746	105,435	104,848	121,830	*
3	Sruthitharangam	162	106	102	113	108	*
4	Disability certificate	*	*	7750	16,245	*	*
5	Disability Pension	400,477	385,050	358,067	326,249	312,828	*

6	Distress Relief Fund	*	*	767	889	889	*
7	Parinayam	*	*	519	736	736	*
8	Aashwasam	310	214	143	*	*	*
9	Aswasakiranam	*	90,251	102,952	*	120,301	*

Source: SJD & Economic Review (2019, 2018, 2017 & 2016)

* Data unavailable

3. Institutions and Programmes for Persons with Disability

The burden of disability can be minimised through proper interventions. The following are the institutions under SJD providing interventions to PwDs:

National institute of Speech and Hearing (NISH): NISH is a premier institute in the area of disability for Disability Studies and Rehabilitation Sciences. It also provides an excellent environment for pursuit of higher studies for people with disabilities. The programmes of NISH include early intervention programme and extension services, hearing and speech-language disorders programme, medical, psychology and allied services, academic programmes, training and industry placement and volunteering and internship opportunity.

National Institute of Physical Medicine and Rehabilitation (NIPMR): NIPMR is dedicated to the early identification, intervention and rehabilitation of children and adults with multiple disabilities, cerebral palsy, stroke, and other associated disorders. In the 13th Plan it has been completely revamped and has emerged as a Centre of Excellence in addressing disabilities, strengthening outreach activities and facilities for occupational therapy and special education.

The Kerala State Physically Handicapped Persons Welfare Corporation: Established in 1979, its activities have grown over the years with a special impetus in the 13th Plan. From an outlay of Rs.4.15 cr in 2016-17 it was enhanced to Rs. 9 cr in 2017-18 and since then, hovered between Rs 12-13 cr upto 2020-21. Free distribution of aids and appliances, subsidisation of motorised vehicles, self employment scheme through bank loan subsidy and channelizing agency for National Handicapped Finance and Development Corporation (NHFDC) are among its major activities and of immense benefit to the locomotor disabled.

Community Disability Management and Rehabilitation Programme (CDMRP): It is an extension centre of the Department of Psychology, University of Calicut with financial support of the Social Justice Department. The centre aims to provide community-based services which are comprehensive and evidence-based towards prevention, early intervention, management and rehabilitation of children with developmental disabilities.

Institute of Mental Health and Neurosciences (IMHANS): IMHANS provides comprehensive and multidisciplinary mental health care to children with developmental disabilities and psychiatric disorders. It has four adult psychiatry units. The Recovery Facilitation Project (RFP Day Care Project) of IMHANS helps the individuals with severe and chronic mental illnesses to recover

from illness and to empower them to rehabilitate and reintegrate in community. They also provide psychosocial support for Tribal Population in Wayanad District.

Table 2: Beneficiaries of Major Institutes under SJD

Sl. No	Name of the Institution	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
1	NISH	7,298	8,246	7,129	30,212	18,238	*
2	NIPMR	*	*	16,186	25,943	28,113	*
3	CDMRP	*	10,038	27,437	31,699	34,734	6723

*(Source: Unpublished data collected from NIPMR, Annual Reports of NISH and CDMRP, SJD & Economic Review (2019, 2018, 2017 & 2016) for more details), *Data unavailable*

4. Initiatives of Other Departments/Institutions

A. Health and Family Welfare (DH&FW)

Prevention: While many programmes under Health Department like *National Programme for Control of Blindness*; *National Programme for the Prevention & Control of Deafness (NPPCD)*; *National Leprosy Eradication Program (NLEP)*, were initiated much earlier and are continuing, emphasis is here more on newer initiatives.

Screening: Through *Salabham* (Comprehensive Newborn Screening Programme), all babies born in government hospitals are subjected to comprehensive screening. During 13th Plan this facility is extended to all government hospitals. Private hospitals are also doing it but at much higher rates.

Rehabilitation programs: A fourth limb fitting centre is being set up at the District Hospital, Palakkad while three are functioning currently (General Hospital, Ernakulam, District Hospitals at Kollam and Kannur). There are 11 *Physical Medicine and Rehabilitation Units* set up in major hospitals in 11 districts (except Pathanamthitta, Idukki and Kasaragod). For the rehabilitation of Persons with locomotor disability, a *Welfare Society for the Locomotor Disabled* (together with SJD) was formed earlier (2013-14). However, during the 13th Plan assistance per beneficiary has been significantly increased to Rs.50,000 per person.

A new initiative during this Plan is Day Care centres for mentally ill in remission under *Comprehensive Mental Health Scheme* launched in 2017-18. The State Government has started 26-day care homes and 506 cured mentally ill patients are being given day care.

Financial Assistance: The *Karunya Benevolent Fund (KBF)* is one of the schemes under KASP which gives financial assistance for the treatment of haemophilia patients without checking the eligibility. The scheme was implemented till 2018 through the Department of State Lotteries.

Child Development Centre: An autonomous centre in early child care and education, adolescent care and education, premarital counseling, women's welfare and other related fields to reduce childhood disability through novel scientific initiatives and create a generation of prospective and responsive parenthood.

Institute for Cognitive and Communicative Disorders and Neuro Sciences : ICCONS provides intervention and assessment for various disorders such as Autism, learning disability, developmental language disorders, mental retardation, cerebral palsy, hearing impairment, adult stroke and related problems, Parkinson's Disease, Dementia, Aphasia and other genetic and metabolic disorders affecting speech, language and cognitive functions in children and adults. It also provides special education schools for children with Cognitive Language Disorders.

B. Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST): It provides treatment for Parkinson's Disease, neurological disorders, movement disorders etc. The Comprehensive Care Center set up in collaboration with NISH in 2016 aims at a life cycle-approach for neurodevelopmental disorders such as autism, learning disability, cerebral palsy, intellectual disability and global development delay. Under the second phase of the project in 2018, a sensory park has been set up at NISH

Table 3:Beneficiaries of Major Institutes under Department of Health and Family Welfare

Sl. No	Name of the Institution	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
1	Child Development Centre	14,174	15,230	19,059*	*	*	*
2	Kerala State Mental Health Authority	An average of 17000/month					
3	District Mental Health Programme	An average of 10080/month					

Source: Economic Review: 2019, 2018, 2017 & 2016)

*Data unavailable

C.Department of General Education, Samagra Shiksha Abhiyan: Its *Individualized Education Program (IEP)* is for slow learners, modelled on resource room training in normal schools. If a child with disability has difficulty in coping in regular schools, then they are catered through *special schools*.

From the year 2018-19, Samagra Shiksha lays emphasis on improving quality of education for all students, including CWSN, providing support for various student oriented activities, provision of aids, appliances, Braille books, large print books and uniforms, therapeutic services, development of teaching-learning material (TLM), in-service training of special educators and general teachers on curriculum adaptation, stipend for girls with special needs etc. The first *autism centre* started in 2008, under the (earlier) Sarva Shiksha Abhiyan (South URC) is at Satram School,

Thiruvananthapuram. An average of 3500 to 4500 children are benefiting from Samagra Shiksha Abhiyan (raw data from Department of General Education).

Special School Kalolsavam for children with special needs is also held by the Education department.

State Institute for the Mentally Challenged (SIMC) is an autonomous society registered under the charitable society's registration act 1995, also providing training to persons with mental illness.

D. Department of Higher Education: CeDS (Centre of Excellence for Disability Studies) with focus on innovations in rehabilitation technologies is established as a part of LBS Centre for Science and Technology, Thiruvananthapuram. It undertakes academics, research, training and extension activities in order to actualize the goal of empowering the persons with disabilities at the grass roots level.

The Additional Skill Acquisition Programme (ASAP) offers vocational skills training to facilitate the employment of disabled students at NISH, who failed to clear eligibility of the Computers and Fine Arts course offered by NISH. ASAP conducted two Skill Training Programmes for them in NISH (31 beneficiaries/batch) (Raw data from NISH).

Institute of Research in Learning Disabilities (IRLD) has been established at School of Behavioural Sciences, MG University, in 2014 for conducting studies, research, publications related to learning Disability and Inclusive education. *Inter University Centre for Disability Studies* (MG University) is working to develop higher level professionals in the field of disability studies and to develop a holistic approach for the total rehabilitation of the disabled.

E. Department of Agriculture: Kerala Agricultural University, Vellayani has started a programme with support of KSSM in 2018 to provide Horticulture Therapy to PwDs, which uses plants and plant-related activities for physical, mental and social well-being. In the year 2019-20 two programmes were conducted at the Department of Community Science, College of Agriculture funded by KSSM and Department of Agriculture. The outcome study shows a significant improvement in social intelligence and psychomotor functioning of disabled children.

F. Local Self-Government Department (LSGD):

Scholarship: Using the Tribal Sub Plan (TSP) funds for disabled, LSGD is providing *scholarships* to CwDs through ICDS, under the mandatorily required fund (five per cent for children, disabled, transgenders).

Employment: Mahatma Gandhi National Rural Employment Guarantee Act 2005. Even though the scheme is not for PwD, as per the KSSM Disability Survey (2015), more than 66 thousand PwDs are beneficiaries of this.

Pension: Either intellectually disabled or physically disabled elderly destitute with more than 40% disability are getting pension through *Indira Gandhi National Disability Pension Scheme*.

Kudumbashree Mission: Kudumbashree initiated a disability program namely 'BUDS' schools to overcome the labelling and stigmatization towards the intellectually disabled children and provide free and open special schools for various categories of children upto the age of 18 years. There are 138 BUDS Schools in the State, owned and managed by the local government institutions under the support and guidance of Kudumbashree Mission. To fill a gap in the State's existing system for providing care to those above 18 years, BUDS Rehabilitation Centres (BRCs) were started in rural areas for training, day care, and health care of such PwDs (Intellectual Disability, Cerebral Palsy, Autism, Multiple Disability). There are 151 BRCs in Kerala.

G. Department of Women and Child Development:

Education: For providing appropriate training and remedial therapy to pre-school children with disabilities, one anganwadi in every Integrated Child Development Services (ICDS) project is designated as a special anganwadi (445 children-Economic Review, 2019). At present, the project is implemented in Kozhikode District. Started in 2018, it has had a great impact on children in performing their Activities of Daily Living (ADL) and to become more accommodative in their further schooling.

H. Department of Labour and Skills

Employment and Skill Development: In 2016, *Kaivalya* was introduced as a comprehensive scheme for achieving the goals of social inclusion and equality of opportunity for all citizens with disabilities. About 7449 PwDs (as stated earlier) are expected to benefit from this scheme this year. Special employment exchanges for disabled persons have been established at Thiruvananthapuram, Neyyattinkara, Kollam, Kottayam, Ernakulam and Kozhikode.

I. Department of Sports

Scholarship: Kerala State Sports Council had implemented *Dr. APJ Abdul Kalam Scholarship* for encouraging eminent sports players in the State. Under this scheme, 5-15 sports persons (Physically disabled) from the age group of 14 to 20 years are benefited from these scholarships every year (Economic Review, 2019). The scholarship was started in 2015-16.

5. The Pandemic Covid-19 Scenario

By 10th February 2020, KSDMA in collaboration with NISH produced an Indian Sign Language (ISL) awareness video about COVID-19 and published it in social media. It was the first awareness video in ISL about the pandemic. The repairing and replenishment of the batteries of assisted devices of PwDs were affected due to Covid 19 lockdown. KSDMA made arrangements to deliver the batteries at the door steps of PwDs and allowed the opening of hearing centres with the help of the fireforce and volunteers. Food was also distributed to the needy PwDs. In addition CM's Live briefing about COVID-19 was also interpreted in ISL with the help of NISH.

Covid-19 is affecting the vacations of PwDs living in Institutions. In telephonic interviews, three such home directors in Thrissur and Kottayam stated that the inmates are ‘sad since they are not able to meet their parents and relatives’ due to lockdown.

Suggestions for Disaster Risk Reduction (DRR)

- a. Training on search, rescue and evacuation of PwDs: This should be provided to all rescue teams (fire force, police, volunteer groups and others identified by KSDMA). Evacuation plans for PwDs must be framed and incorporated into DRR strategies and should include supply of necessary equipment (PDNA,2019).
- b. There is a need for tracking of PwDs using GIS in each LSGI and Disaster Prone Areas in order to minimise the risks of rescuing PwDs.
- c. There shall be measures taken up to set up disabled-friendly temporary shelters and buildings at the LSGI level with the required facility for information and communication, health and education that are accessible for PwDs.
- d. There is a necessity for introducing disability inclusive climate resilience programmes and Disaster Risk Reduction (DRR) strategies as a part of implementation of the SDGs. The Sendai Framework for Disaster Risk Reduction 2015-2030 may be adopted for the same (UN, 2020)

6. Recognitions received from 2016-2020

1. On the occasion of International Day of Disabilities on December 3, 2019, Ministry of Social Justices and Empowerment awarded Kerala the Best State in Promoting Empowerment of Persons with Disabilities.
2. In 2018-19, the Kerala State Handicapped Persons Welfare Corporation received the award for Best Channelising Agency of National Handicapped Finance and Development Corporation and also incentive for higher turnover.
3. In the World Hearing Forum of the World Health Organization, Kerala also got selected to be a participant. The ENT department of the Kozhikode Medical College has received membership in the World Hearing Forum.

7. Empowering Persons with Disabilities: A Vision for Kerala

Over the past decades, Kerala has been a pioneer in spearheading projects for persons with disabilities. However, that gaps exist is clear from the above review: *There are no special services, schemes, financial assistance and pension from the side of the Government for PwDs with Dwarfism, Parkinson’s Disease, Muscular Dystrophy and Multiple Sclerosis. Programs that benefit these patients should also be designed and implemented in line with RPwD Act 2016.* There are major gaps with respect to *Accessibility*, in terms of necessary infrastructure support for PwDs and *lack of registry*. There is no integrated system that combines the activities of different departments; nor enough records of details of PwDs availing the services from the State. In addition, what comes out very clearly, is that *multiple departments* are providing the same type of services. The larger goal at achieving independent living for PwDs within the next 25 years should be the target, within which all major gaps would be addressed, as envisaged in the RPwD Act 2016.

Major Initiatives for the Next 25 Years for an Inclusive Society

As an initial move, the state government may start with following activities:

Integrated multi-departmental initiative: The need for a cell which can coordinate various activities for PwDs in the departments such as Social Justice, Health, Education, Labour, LSGD etc. This cell shall also oversee the implementation of the disability rights in its essence. This cell shall have a reporting officer to the Chief Minister, other officials, collaborative resource persons from disability areas like experts, academicians, professionals, caregivers of PwDs and empowered PwDs in this integrated system.

State Disability Registry: The existing disability census done by KSSM in 2015 can be converted to a digital registry of the State. This can bring the disability data live and dynamic. This live data shall be helpful in introducing an online Individual Care Plan (ICP), which can be pipelined for implementing a life cycle approach for PwDs. This registry shall help to identify the needs of PwDs and to what extent the authorities can fulfill the needs. It will also guard against duplication. In addition, there is need for an online registry that contains the details of the children in all Gynaecology and Obstetrics Department, and the Paediatric departments of every hospital where radiological screening is positive for congenital anomaly. Doctors from government and private sectors should be trained on recent developments and research on identification of birth deficits and necessary steps to be taken for a healthy delivery.

A possible suggestion to keep the Unique Disability ID is the collaboration with a bank, so that the PwDs can use it like an ATM card which functions like a universal card for PwDs.

Early Detection: Kerala is a state in which immunization programs have been successfully implemented in the past decades. According to Joy et al. (2019),³⁰ among the children aged 12–23 months, 89 per cent (95 per cent CI 85.5 per cent–92.5 per cent) were fully immunized, 10 per cent were partially immunized, and one per cent unimmunized in Kerala. This should further expand towards monitoring development delays, if any, using simple developmental screening tools designed and validated by CDC – the Development of Observation Card (DOC) or Trivandrum Developmental Screening Chart (TDSC).

Community Based Rehabilitation (CBR): The geographical mapping of persons with disability should be done in order to implement successful community-based rehabilitation at LSGI level. Currently, Kerala does not have a strategy to reach out to all the persons with disability. Moreover, human power development in rehabilitation should be focused at village level, block level and at the district levels to reach out to the needs of more persons with disability.

Readiness assessment and transition program: Readiness to school should be assessed before integrating a child with disability to an education system. There are no model transition programs that make the child independent in the classroom. These transition programs should provide training on social skills, language and problem solving ability.

³⁰ Joy, TM, George, S, Paul N, Renjin, BA, Rakesh PS, and Sreedevi, A (2019): Assessment of Vaccine Coverage and Associated Factors among Children in Urban Agglomerations of Kochi, Kerala, India, *Journal of Family Medicine and Primary Care*, 8(1), 91-96.

Setting minimum standard criteria and accreditation of NGOs and BUDs institutions and Special schools: There is a need to set minimum standard criteria and accreditation to NGOs once in every five years with assessment protocols. Furthermore, a mechanism to monitor and evaluate the outcomes of early intervention should be planned. Indicator-based progress reviews can bring about timely changes in the system for the best results. For BUDS schools and Special schools also, minimum standard criteria should be set. There is a need for more systematic campaigns for preventing the acquired disability. One of the most common causes are road-traffic accidents and occupational hazards (KSSM Survey, 2015).

University for Disability Studies and Rehabilitation Sciences: University Grants Commission (UGC) through a scheme of Higher Education for Persons with Special Needs (HEPSN) 1999–2000 brought a new beginning in the field of higher education for people with disabilities. Its most salient objective is to provide equal opportunity offices at all universities which shall offer disability support services. A research survey by *National Centre for Promotion of Employment for Disabled People* (NCPEDP) India, 2005³¹ reported that in 119 Indian universities taken as a representative sample out of 322 universities, only 52 universities provided data on the number of students enrolled with them. Only about 0.1 per cent of students with disabilities were found to be enrolled against the three per cent reservation for students with disabilities at various streams of higher education. This clearly indicates that students with disabilities are not reaching the higher education stream in India. Sarkar (2016)³² reports of various problems like course content, trained staff facilities, accessible environment, social stigma, negative attitudes, scarce resources, educational policy, legislation, lack of adequate devices and assistive technology and so on. In Kerala, except NISH there are no other higher education institutes providing higher education for PwDs. Thus, there is a need for a University for Disability Studies and Rehabilitation Sciences in Kerala

There is a huge lacunae of rehabilitation professionals/clinicians in the country to cater to multiple needs of PwDs. There is an urgent need for improving the quality of healthcare clinicians/rehabilitation professionals working with PwDs by ensuring adequate numbers of PwD-professional ratio and updation of knowledge by the rehabilitation professionals/clinicians through continuous professional development (CPD).

There is also a need for creating indigenous technologies/materials which are affordable for the common people. As of now the methods/ technologies/ standards are mostly adopted from developed countries. A paradigm shift by indigenising the development could be done through a university.

³¹ NCPEDP (2005): Status of mainstream education of disabled students in India. Retrieved from <http://www.ncpedp.org/eductn/ed-resrch.htm>

³² Sarkar, R. (2016): Inclusive university: A way out to ensure quality, equity, and accessibility for students with disabilities in higher education. *International Journal of Advanced Research*, 4(4), 406–412

Research should be encouraged to develop diagnostic and screening tests for various disabilities. Centers like NISH, NIPMR should collaborate to develop model intervention programmes through research and should develop training modules for teachers and parents in video, audio and text format. Development of disability specific assistive technology development should be considered in collaboration with NITs and IITs. In addition, there is a need for developing a Physical Education Department for training and equipping the PwDs with the vision of participation in Paralympics.

Employment and Skill Development

There is a necessity to provide equal opportunities in the employment sector to all PwDs by removing the barriers through mechanisms that include non-coercive legislation and regulation, tailored interventions, internships, vocational rehabilitation and training, self-employment and microfinance schemes, social protection, and working to change discriminatory attitudes and biases against PwDs. For this purpose, there is a need for providing enough awareness to the employees in all agencies including private, NGO and government organizations through orientation programs (UN, 2020).³³

Skill development should be provided to all PwDs to promote independent living and engagement. The National Skills Qualifications Framework (NSQF) has introduced 60 courses which PwD can undertake. An awareness about these courses and its scope should be provided to parents along with the market analysis. Vocational education can be a parallel stream from high school. Rubrics of assessment should be at application level than at theoretical level. The skill development programs can lead onto incubator cells for refinements. Currently there are no model programs running in the state addressing the employment issues of PwD which should be planned. Kerala Startup mission can give an emphasis on disability employment and entrepreneurship. More courses in ASAP should be designed to employ PwDs. The Government can tie-up with NGOs and Kudumbashree units in order to find employment for PwDs based on their skills and types of disabilities. Some of the few organizations are Kanthari, an International NGO, based in Trivandrum, which provides training to start entrepreneurships with scholarships, and NIT's which find resources and technologies, training and other support.

Assisted Living: Assisted living is an area that has/is being debated in a number of platforms. "What is after me?" is the eternal worry among the parents of PwDs. Assisted living is a shift from a passive home or institutionalization to a concept of independent living in the community, which is a reflection of new ideas that are emerging. There is a need for conducting future research in this area by visiting the structure of retirement homes in Kerala by focusing on the infrastructure, assisted living technologies, skill development and employment opportunities. The report of the expert committee (constituted by the State Planning Board jointly with the Education and Social Justice Department) on assisted living with a model programme proposed should be reviewed by the government.

³³ United Nations (2020).

<https://sustainabledevelopment.un.org/index.php?page=view&type=30022&nr=261&menu=3170>

Accessibility: There is a need for promoting disabled-friendly public accommodation, transport, information, and communication to ensure the participation of PwDs in education, employment and social life like others. There should be guaranteed access to bank loans and micro-finance for start-up businesses, whose interest rates take into account the additional costs related to disabilities (UN, 2020). All levels of existing healthcare and social protection systems should be inclusive and public healthcare policies, programmes, facilities and information should be accessible by PwDs. Free healthcare services to PwDs should include provision of disability-related extra costs, financial risk protection etc

More strategies are required to change the current transport system to a disabled-friendly transport system -- both public and private transport which needs to be looked into in depth. A possible modification to Barrier Free Kerala is, before giving sanction or funds from the State/Central Government for construction or renovation of buildings, parks, museums, hospitals, educational institutions, offices, religious institutions and other social gathering places, the Government needs to confirm that the construction shall not leave people with disabilities out.

Legislation: A prime concern should be the reduction of violence and abuses against elderly, women and girls with disabilities. The legal systems should promote and defend the rights of PwDs by ensuring the accessibility of jurisdiction (UN 2020).

8. Conclusion

Persons with Disabilities have equal rights to live and engage in all activities like every other person in Kerala. Whenever a person feels excluded just because of disability, the person will develop a sense of worthlessness and a feeling of being a burden. Therefore it is essential to establish a cell/unit which can monitor and track all the initiatives and projects for PwDs irrespective of which department is providing the services. There should also be specific budgets proposed for people with disabilities across all the departments through adopting one Disability Question and unifying it across all Initiatives. Screening programmes and Early Intervention Centres should be expanded throughout the State. The advantage of a University of Disability Studies and Rehabilitation Sciences would be to ensure higher education to PwDs and training to all other people in disability affairs. There is a need for developing indigenous materials and technologies which are affordable to common people. All the equipped PwDs should be employed in some way to earn a minimum standard of living. Those who need care and support should be supported either by assisted living programs or Community Based Rehabilitation programs. The future research should develop models for an inclusive society.

Appendix 1 *Distribution by type of disability, KSSM (2015)*

Sl.No	Type of Disability	Number of PwDs	%
1	Locomotor Disabilities	261087	32.89

2	Muscular Dystrophy	2280	0.29
3	Chronic Neurological Disorders	3633	0.46
4	Multiple Sclerosis	515	0.06
5	Kyphosis	4887	0.62
6	Short Stature/Dwarfism	6079	0.77
7	Blindness	20477	2.58
8	Low Vision	61900	7.8
9	Specific Learning Disability	8074	1.01
10	Speech Language Disability	22648	2.86
11	Intellectual Disability	68934	8.69
12	Mental Illness	100983	12.71
13	Autism Spectrum Disorder	3135	0.39
14	Hearing Impairment	60925	7.67
15	Leprosy cured patients	1175	0.15
16	Haemophilia	1445	0.18
17	Thalassemia	569	0.06
18	Sickle Cell Anaemia	1006	0.13
19	Cerebral Palsy	6385	0.8
20	Epilepsy	19512	2.46

21	Deaf Blindness	842	0.11
22	Multiple Disabilities	137446	17.31
	TOTAL	793937	

Appendix 2 *District-wise Statistics of PwDs*

Sl.No.	District	No. of PwDs	%
1	Thiruvananthapuram	77164	9.73
2	Kollam	66519	8.38
3	Pathanamthitta	30447	3.83
4	Alappuzha	51403	6.47
5	Kottayam	45781	5.77
6	Idukki	26226	3.3
7	Ernakulam	74127	9.34
8	Thrissur	67133	8.46
9	Palakkad	62814	7.91
10	Malappuram	96447	12.15
11	Kozhikode	78548	9.89
12	Wayanad	23122	2.91
13	Kannur	58535	7.37
14	Kasaragod	35671	4.49

Source: KSSM survey 2015

In 2014, a landmark judgment of the Supreme Court of India³⁴, firmly established the right to equality and equal protection for transgender persons (TGs). In India, transgenders are now considered to be the Third Gender. The scrapping of Article 377 is also a landmark judgment in Queer discourse (Sirohi,2016)³⁵; the recognition of all non-normative sexual orientations as legal remains a distant dream.. However, the recent [Transgender Persons \(Protection of Rights\) Act, 2019](#), has raised several concerns regarding the status of transgender people in India.

1. Transgender Persons in Kerala

In Kerala, just like any other Indian state, the heteronormative division of labor and power is accepted for a very long time. This has been regarded as “normal”. The genesis of the problem of TGs lies in the stigma and discrimination they face in society, resulting in their exclusion from the political and socio-economic sphere. Following the Supreme Court Judgement, Kerala is the first State in India which declared a Transgender Policy in 2015, preceded by a socio-economic survey of the community conducted by the Social Justice Department ³⁶seeking information on all aspects of their social and personal life. It reveals that they are unable to acquire even basic capabilities essential to a life of well-being and dignity; widespread and intense conservatism denies the same status to the interests and demands of these people. The policy covers all the categories of TGs including but not limited to MtF TGs, FtM TGs (expand), and Intersex people. The Kerala policy emphasizes the rights of TGs, including to self-identify as man, a woman or TG as stated in the Judgement. The policy was launched at an international conference on Gender Equality held by the Gender Park (then under Social Welfare department) under Women and Child Development, in November 2015 which was marked by the great visibility given to transpeople. Twelve transgender leaders from inside and outside the state participated affirming the government’s commitment to a gender-just society.

Some major findings of the survey revealed the following:

- 51 per cent are not willing to come out with their gender identity to their own family.
- Fifty-eight per cent of the transgender students could not accomplish an education beyond 10th grade and many were forced to leave the school at a very young age.

³⁴ The Supreme Court in its judgment stated that “Given the constitutional guarantee, the transgender community is entitled to basic rights specifically, freedom of expression, right against violence, right to Personal Liberty, dignity, Right to Education and Empowerment, discrimination, exploitation, and right to work. Hence, every person must have the right to decide his or her gender identity and expression including Hijras, transsexuals, transgender and should have the right to freely express their identity and be considered as a third sex”

³⁵ Sirohi, Harsh(2016). "Transgender: A Taboo in India?" retrieved from <https://harshsirohi.wordpress.com/2016/04>

³⁶ The survey was conducted by the *Sexual Minority Forum for Kerala* and *Sangama* in 2015.

- The monthly income of 54 per cent transgender community in Kerala is below Rs.5000.
- Only 11.6 per cent have got a permanent source of income in the form of a job.
- A high 89 per cent are sexually harassed at their workplace.
- 28 per cent got raped by their immediate family and partners.
- Ninety-six per cent are not ready to file a complaint at the police station. Fifty two per cent were ill-treated by the police department, 70 per cent are afraid of approaching a police station for their issues.
- Seventy-eight are not ready to assert their identity because of the challenges and discrimination ahead.

Based on the above findings, the Policy provided a road map for ensuring certain basic rights to TGs, namely, the right to equality, freedom of expression, right to dignity and life without violence, right to employment and right to equal access to education and health services. It recommended the establishment of a State level Transgender Justice Board and District-level TG Justice Boards that can register TGs and issue identification cards. The Department of Social Justice has established these Boards in 2016-17.

2.State Initiatives for the TG Community in the 13th Five Year Plan

In March-April 2017, a government notification sanctioned membership of a TG to the Boards. An early intervention was in 2017 in Kottayam. According to the survey conducted in 2015, there are 392 identified transgenders in Kottayam. As a solution to their health-related problems and to make hospitals more accessible to the TG, a Special Out Patient clinic for transgenders was set up at Kottayam Medical College, on a trial basis with a team of specialists in different fields. This venture would help TGs avoid the usual long queues in hospitals and hostile gazes from other patients. Visiting a doctor usually takes a toll on their morale. Another major purpose of this clinic is to avoid the practice of self-medication under peer pressure. The District Legal Services Authority has also collaborated with this project to make the hospitals more comfortable for TG.

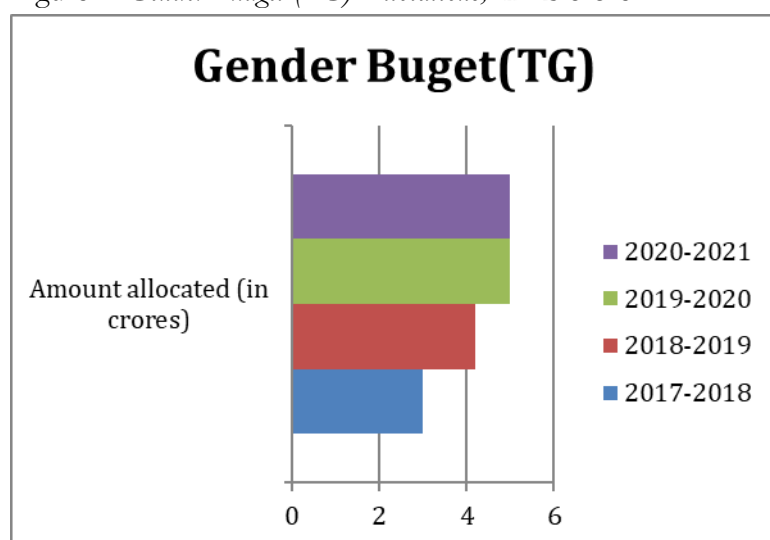
Sex Re-assignment Surgery (SRS) is the most demanded service they want from a hospital. Before the surgery, they will undergo multiple counselling processes to make them ready for a psychological role change. Doctors will also take into account their sexual history, patterns of depression, and other factors to make them ready to live their lives as the opposite gender. The waiting period for the surgery can take up to four years; hormonal treatment is given under the supervision of doctors during the waiting period. It is a long and tiring process that often makes them bankrupt.

Kerala is one of the few states having a separate allocation for transgenders in the Budget. In the revised budget of 2016-17 (with a new government assuming power) the Government introduced a monthly pension for the transgender people above 60 years old to express solidarity with the third gender group. SJD was able to provide scholarship to a few TG students, and it conducted district level workshops for assessing livelihood training and other matters relating to mainstreaming of TGs.

Right from the formulation of the first Gender and Child Budget in 2017-18, a separate allocation has been made for transgenders in the Gender Budget (Part A): Rs 3 cr in the first year; Rs. 4 cr in 2018-19; Rs. 5 cr in 2019-20 and at the same level, Rs.5 cr in 2020-21 (see Figure 1 below).

In **2017-18** a major scheme for TGs was introduced with a number of components, which proposed a Transgender Helpline (24x7) and crisis management centre with the help of accredited NGOs working in the field of transgenders, financial assistance for vocational training and self-employment, financial assistance for proper education as the incidence of school drop-out is high, scholarship for transgender students.

Figure 1: *Gender Budget (TG) Allocations, in Rs crore*



Source: Gender and Child Budget, different years, Dept of Finance, Government of Kerala

Other initiatives were Sex Re-assignment Surgery (SRS) in Government Hospital based on medical advice, opening HIV sero-surveillance centre for transgenders, sensitizing the public, especially parents and family members, teaching and non-teaching staff and student community of educational institutions, officers of the Health Department, LSGD, Employment Department, and Labour Department to the right to equality of Transgenders.

2018-19

While most schemes were specifically meant for TGs, a small attempt was also made in the 2018-19 Budget to mainstream them through integrating their needs into education. The State Literacy Mission Authority initiated a special programme in the 4th, 7th, 10th and 12th equivalency programme, in which 79 persons passed 10th and 12th; 65 TGs passed in 2019-20. Kerala Lalit Academy allocated funds for a Special art camp in which TGs also participated. In 2018-19, the TG Cell in the Directorate was set up for design, coordination and implementation of various activities for the TGs giving them a voice in their own planning.

The Kerala State Literacy Mission launched a new programme for the transgender community to provide monthly scholarships and shelter homes for TG students in four districts -- Thiruvananthapuram, Kollam, Pathanamthitta, and Alappuzha. This is an extension of another programme *Samanvaya* that focuses on providing free and continuing education for the minority gender in the state, based on another survey carried out in 2018 among 918 transgender persons to identify those willing to enroll in the Mission's various continuing education programs. The survey was called 'Survey 918' (see Box 1) the results of which point out to the low illiteracy rate but a wide gap in learning as one moved to higher levels of schooling/education among the members of the community.

Box 1

The SLMA program is reportedly the first-ever comprehensive literacy program for transgender persons. The findings of the survey:

- The transgender population was fairly evenly spread among urban and rural areas: 32.09 per cent in municipalities; 49.33 per cent in panchayats. In corporation limits it was much lower, 18.59 per cent.
- Out of those surveyed 81.3 per cent were trans-women (a person assigned male gender at birth but one who identified oneself as a female), while 18.25 per cent were trans-men (a person assigned female gender at birth but one who identifies as a male). A small 0.44 per cent fell in the inter-sex category (presence of both male and female reproductive organs in the same individual).

Employment/Unemployment

- While 20.35 per cent of transgenders surveyed were unemployed, 16.70 per cent worked in the private sector; 1.65 per cent had government jobs, 5.86 per cent were working in semi-government institutions. A majority of the people who were employed had not disclosed their distinct sexual identity before the society or any official records.
- Over 30 per cent were engaged in some form of self-employment. The survey also revealed six out of 100 transgender persons were engaged in begging and eight out of 100 in prostitution.
- Over four per cent of the people did not have any documents to prove their identity. Around 73 per cent had their names enrolled in a ration card. However, most families were reluctant to accept there was a transgender person in the family.

Educational Status

- The survey found that only 1.2 per cent of the transgenders surveyed were unable to read or write. The number of school dropouts among transgenders increased as they progressed to higher classes, mostly due to social stigma. While 10.61 per cent dropped out of school between classes IV and VII, around 40 per cent dropped out between classes VII and X. Among the transgender surveyed, 26.55 per cent had passed the plus two courses. While 13.60 per cent transgenders were graduates, 2.10 per cent were postgraduates.

The equivalency classes were designed in accordance to the survey findings.

The allocation for TG persons was raised in 2019-20 to Rs. 5 cr and all the schemes under SJD came under a comprehensive umbrella scheme - *Mazhavillu*. Some other Departments like Health, Homeopathy introduced schemes for TGs. Facilities for free SRS surgery had been established in Kottayam Medical College which continues, and a programme viz. *Nisarga* was started by Homeopathy Directorate for counselling and medication of TGs.

Responding to the felt needs of TGs, some components of the *Mazhavillu* got more emphasis and in 2019 it was shelter homes for TGs (one transman and three transwomen working at Trivandrum, Kozhikode, Ernakulam and Kottayam), financial support for TGs for writing competitive exams, transgender kalavolsavam, and marriage assistance to TG community. Amount being disbursed under SRS surgery has also seen an increase (to Rs.2 lakh) in any hospital based on medical advice. In 2020 it has been increased to Rs.5 lakh.

The TGs have been included as a priority category in the LIFE Housing Mission project. Some amount will be used for their training and self-employment, for running speciality health care clinics in select hospitals and for continuing their literacy programme with the State Literacy Mission. **Mahatma Gandhi University**, at Kottayam, set aside an amount as part of the Project for Transgender.

In the **School Education department**, under SCERT, an amount was earmarked for a textbook module on women and children's Constitutional Rights to generate knowledge about this among the children. This scheme, called *Naitikam*, though not directed at TG students in its implementation, created awareness about the "third gender" through posters and other materials used to teach children on Constitutional Rights.

Skill development training has been given to 90 TGs, 62 have been provided employment. Beautician training is a favoured course among TGs, 45 of whom have been trained. Twenty-one opted for sewing machines for livelihood creation. Loan for self-employment (upto Rs. 3 lakh at very low interest rate) was provided through **Kerala State Women Development Corporation**. Educational scholarships were given to many more this time, numbering 14, and 10 were given financial assistance for hostel accommodation. Financial support was given to 18 TGs for SRS, 19 given after care in a rented house taken by the Department. Pensions, which started in 2017-18, continue to be given to destitute TGs above 60 years of age. An attempt was also made to evaluate effectiveness of schemes prepared for TGs through an online Survey.

Other continuing initiatives are the issuing of ID cards/follow up activities, transgender helpline (24x7) and crisis management centre with the help of NGOs (working in the field of transgenders)/CBOs. There are initiatives for advocacy campaigns by engaging professional media agency, for arranging sensitization programmes, conducting workshops and training programmes for the TG Community, CBOs, and Social Justice Board members. A HIV sero-surveillance centre for transgenders, formulation and implementation of a medical insurance scheme, and providing post-SRS surgery assistance to Transgenders (Rs.3000 per month per person is given for a year) have also been initiated.

Under **Department of Cooperation** a scheme called Assistance to Miscellaneous Co-operatives has made provision for extending assistance to different categories of co-operatives, including TG cooperatives and societies having transgender as members for implementing various employment-oriented programmes. The assistance will be in the form of share capital contribution, managerial grant and subsidies, and loan.

A small amount has been allocated for conducting programmes for the transgender community as part of Gender Programmes by **Kerala Youth Welfare Board**, along with other gender initiatives. Social Justice Department is the Nodal Agency for implementing the Social Legislations, International Conventions and Policies for the outlier groups. It provides outlays for implementing Transgender Policy along with other policies and conventions.

Socio-economic empowerment of transgenders by creating livelihood opportunities and waste management as a means of livelihood will be taken up as innovative and special projects under Deendayal Antyodaya Yojana -National Urban Livelihood Mission (DAY- NULM) (60% CSS).

2020-21

In 2020-21 Gender Budget, the amount allocated for the TG community is Rs 5 crore, the same as the previous year due to reduction in the plan size. Some new components under *Mazhavillu* have been proposed which include assistance for establishing group entrepreneurship by transgenders, by providing loan through **Kerala State Women Development Corporation**.

Department plans to conduct a study for ascertaining the health issues of TGs who have undergone SRS and post SRS situation.

Two seats are allowed in addition to existing allotment for transgender individuals in the graduate, post graduate courses in Government, Aided Arts and Science Colleges. Scholarship assistance to TGs for higher education has been extended -- Rs.20,000 for study and Rs. 40,000 for accommodation and food are given under this scheme.

In the **PSC application form** TG column has been inserted in the space to write ones sex.

Transgender friendly toilets have been constructed at Maharaja's College, Ernakulam.

Two **TG blocks** are to be constructed in Trivandrum and Ernakulam jails under Prisons and Correctional Services department. There is one in Palakkad.

In September 2020, under the **Chief Minister's Entrepreneurship Development Programme**, the first amount of Rs.75,000 was given to a TG by the Finance Minister.

3.Kudumbashree and Transgenders

A Neighbourhood Group (NHG) of TGs was formed in Kottayam region, one of the spots with a large populace of the community. The new NHG, named *Manaswini*, registered with the

Kottayam North Community Development Society (CDS), has twelve transgender members. But they did not belong to one neighbourhood; so they registered as a special NHG.

A landmark achievement in mid-2017 was a three-year agreement between **Kochi metro** and Kudumbashree to run the metro service. Of the 618 staff recruited for the 16 metro stations and the Aluva depot, based on a written test in which more than 60,000 candidates appeared 23 were TGs. Among the TGs those who had completed 10th standard were posted on housekeeping duty, while graduates were posted at ticket counters. The credit for enlisting 23 individuals from the transgender network in June 2017 goes to Kochi Metro Rail Limited (KMRL), said to be the first government-owned organization in India to officially administer them. But among the 23 individuals, only 14 of them stayed on. Others went for pursuing post-graduation and for some other jobs; the number is now 11.

4. Local Governments and TGs

From 2017-18 some local governments have been allocating funds to meet felt needs of the TGs. In that year district panchayats of Trivandrum (*Samanwayam scheme*), Kollam, Kozhikode, Wyanad, Kannur, put aside Rs. 2.10 lakhs for Training and support to skill development and self employment schemes for TGs. Kozhikode corporation also undertook a survey of TGs. In 2018-19, Palakkad and Ernakulam district panchayats also proposed special schemes for training and self-employment supporting the purchase of necessary equipment for their enterprises also. Beautician course is much coveted among TGs. Kallooppa GP and Noolpuzha GP, engaged TGs in wage employment. Thrikkakara Municipality provided a kiosk and Pandalam municipality organised an Arts festival and competition of TGs. In 2019-20 there was a large increase in the number of local bodies responding to the needs of TGs. They included the block panchayats of Mathilakam and Kuttipuram; the Trichur and Alappuzha district panchayats, the Kollam Corporation and seven additional GPs. These are Cherukole, Parathode, Ramamangalam, Elappully, Balusseri, Chemnad and Thiruvambadi. A few new initiatives undertaken were to provide housing for TGs who owned land, construction work, Haritha Karmasena programmes and a Canteen event management group in Alappuzha DP. It included the *Unarv* programme for training and self employment in Kollam DP. In 2020-21, a few new GPs were added, namely, Ariencavu, Kunnumal and Thikkodi, while in others same programmes continued.

Private/Religious Initiatives

Besides these State/quasi-state interventions to address the problems of TGs, there have been private initiatives - among others Queerla, Sahayatrika, Daleview Transgender Suraksha project, and initiatives by religious institutions. Among the latter are Congregation of the Mother of Carmel, Caritas, a social service wing of the Catholic church along with Vijayaraja Mallika, a leading TG activist. These have acted effectively as pressure groups for eliciting state response and creating awareness among the people. For example, since 2010, Queer Prides in Kerala are held across cities such as Trivandrum, Thrissur and Ernakulam, and smaller ones elsewhere. Queer politics and LGBTIQ movements have increased the visibility of queer politics in Kerala over the three decades since the 1990s, and it would appear that the last few years have

witnessed a remarkable shift in the proliferation and in the texture of discourses surrounding non-normative sexualities and queer politics ³⁷.

5.Covid-19 Pandemic and Impact on Transpeople

The transgender community is one segment of the vast informal sector whose livelihood is almost entirely dependent on daily wages and gig jobs, including begging, and paid sex work. The lost livelihood opportunities due to lockdown left them even more vulnerable, with no regular income, no ways to find food and shelter, a complete halt to community life and gatherings, and a pause in health and follow-up treatment. This left most of them facing serious mental health issues of depression and alienation. While already as a vulnerable community they faced problems in their family and public life, this got elevated in the pandemic. The SJD extended help in terms of food kits and shelter but many are living through hidden identity and many TGs are under house arrest. Most of the members in the TG community are without enough documents to prove their identity or even nationality; however the Kerala government has not considered these things while allotting them the food kits; even a paper which states they have applied for the ID card is treated as adequate. So it enables them to acquire the ration given by the State Government.

5.Main issues during the pandemic:

1. Employment and shelter: Like the Trivandrum district panchayat spending on housing for TGs who own some land, other local bodies can follow suit. Lock down period stopped all activities including sex work of TGs and many transmen manage through daily jobs and are uncertain of being reinstated in their earlier work. The government should provide an opportunity to TGs to register in Employment exchanges and appoint them in various temporary posts as early as possible. Kudumbashree has been playing an important role in assisting and directing transpeople to find jobs and other opportunities.
2. Health issues: Most of the transpeople are under treatment of HRT and SRS which is not being followed up due to the lockdown; so many are facing severe mental health issues. Hormone treatment and its follow up can influence mood swing issues and lead to depression. Many are in solitary life and loneliness and face issues from family. As a suggestion Health department should announce a health package for TGs to address these issues and of mental health.
3. One time financial assistance: Most of the community people are suffering a serious financial crisis and shortage of money to buy essential things and meet basic expenses, to resolve which government can support the community by providing financial assistance, as the Rs. 1500 that the National Institute of Social Defence gives. This is a commendable measure by the NISD, and about 4500 TGs from all states have got the benefit, a number that must surely expand.

³⁷ Meena T Pillai's work-in-progress, *Desiring Kerala/Desire in Kerala: Gendered Affect and Assemblage as Development Indicators*, Work-in-progress, Centre for Cultural Studies, University of Kerala, 2020

6. Way ahead: Vision for 2030

It can be seen from the above that after the Transgender 2015 Policy came into force and the TG Board at the state and district level were set up, current government has implemented a number of innovative programmes recognizing basic rights of TGs, to address issues of stigmatization, discrimination, right to equality, right to a life of dignity without violence, right to health and education, training, employment and shelter. These need not be seen as welfare measures alone but as the state's response to the non-governmental pressure groups, and debates spearheaded by civil society from below. However, it is very essential to assess the total impact and understand the reach of these programmes.

It is interesting to note that in spite of many critiques of the Kerala model, a widespread academic awareness of the gender paradoxes, many women, and people of non-normative gender identities, continue to emphatically reiterate a strong desire to inhabit a space like Kerala—a desire which itself can only be relational in terms of what else is available in India. Kerala seems to be a preferred space of citizenship for many (Meena Pillai 2020 op cit).

A major problem is the absence of a sound estimate on number of TGs in the state, a lacunae very much recognized by the government. In fact, all preparations were made for a survey to be done by the Centre for Mangement Development, which however, could not take off due to Covid-19. The figure of 25,000 estimated by the TG Policy has to be revisited. Substantial efforts have been made by the Cell and the Directorate to draw out the TGs for obtaining their entitlements. Even now only 1000 ID cards have been distributed. However, with the applications being online now, the Department expects a larger response.

The commitment of the U.N to SDGs are an important milestone while focusing on the future of sexual minorities, making an agenda of 'leave no one behind'. This pushes for the equality of LGBTQ people. We have discussed largely TG only in this study. Taking a cue from the SDGs, we give below the Way Forward upto 2030 under 6 broad domains relecting the major issues TGs faceincorporating state specific features also.

The actionable steps to ensure:

1) *The Rights of the TG community*

- Civil rights of the TG community must be emphasized. They should not be devoid of basic rights like acquiring a ration card, passport, or obtaining property because of their gender. Welfare schemes should be applicable to all living outside the heteronormative, conventional familial arrangements. Adoption of a child should also be permitted irrespective of gender.
- **Every person should give the right to identify their gender themselves. The screening committee mentioned in the Act 2019, will impede the progress so far.**

- Transparency must be adopted in the police administration while dealing with the cases of the TG community.
- **Like the Article on untouchability, special protection should be given to the community** against any form of discrimination enacted by both the state and the civil society
- The Immoral Trafficking Act of 1956 should not be used for threatening the sexual minorities, rather state should clarify its disposition while dealing with the law

2) *Social awareness*

- **As a state, the other way of upliftment is by providing benefits to the family. The anganwadis could target the mother with transgender children. Since the family is interwoven with the fabric of Indian society, such schemes or awards will help in constructing a different culture.**
- Workshops for the sensitization purpose should be designed creatively not only in the educational institutions but also in the police stations. This will enable them to break the barriers and prejudices against the community.
- The content in the media should be more gender-sensitive. The Press Council of India should design the guidelines to certify the sensitive and respectful treatment of the problem. Media professionals should change their language, dialogue and depictions to promote gender equality and an inclusive society. Norms of reporting and presentation should change to include more women and transgenders.
- In public spaces, like cinema halls or transportation services, more visual representation of the TG community should be given as part of the awareness programme. It can be made possible through billboards or playing short documentaries before the commencement of films, etc.

3) *Health*

- Training healthcare providers to understand the needs of TG people and respond effectively.
- Create outreach health services for TGs who are unable to leave their homes, due to discrimination or exclusion.
- Develop services that meet their specific needs including:
 - HIV and other STI prevention, treatment, care and support services for all LGBT people.
 - Safe-spaces and services that address the wider health needs of LGBT people.
 - Services for trans people to transition safely.

4) *Education*

- School curriculum should be mandated to follow sex education. Children from the age of 10 should be aware of constitutional rights, like the *Naitikam* programme introduced in schools in 2019-20. This will break the heterosexist prejudice in education and give them a liberal perspective towards life.

- Vocational training and personality development should be given to the identified transgender children from the school.
- In the New Education Policy, coding has been given prominence since it is the requirement of the next generation. Anyone can learn to code if they have basic command over English, a computer, and a proper internet connection. If such programmes are introduced for the TG community, it will revolutionize their life and give more job opportunities.
- In the academic spaces, there should be a separate cell for the TG students just like the women cell.
- The questions for the exam must contain topics related to gender and sexuality. This will compel the students to research more about them.
- Provide guidance and training for teachers and counsellors on how to deal sensitively with TG students and students who are questioning their sexual orientation and/or gender identity.
- Adopt a zero-tolerance policy towards homophobic, biphobic and transphobic bullying.
- Make sure that all teaching curricula are TG-inclusive and profile positive role models.
- Make sure that all sexual and reproductive education covers the specific needs of TG students and those who are questioning their sexual orientation and/or gender identity.
- Promote a culture of non-discrimination and acceptance (in schools, universities and wider society), emphasising that TG rights are human rights.

5) *Employment*

- The measurable actions are to research a better understanding of how TGs are discriminated against economically, ensure private sector development projects are designed to address their economic needs, social assistance programmes (such as cash-transfers) recognise the need of TG people and provide assistance for the poorest, in particular by strengthening community feedback mechanisms and support TG people to set up their own businesses.
- *Kerala should focus on Gender Park, with its emphasis on addressing the issues of non-heterosexual identities, to have progressed for the TG community. 'She-Taxi', Gender Library, and International Women's Trade Centre should have the participation of the TG community.*
- Reservation in teaching jobs should be given in all aided and unaided schools to have an inclusive approach in the field of education.

6) *Shelter*

- Support and train local government and housing associations to take account of the specific needs of young TG people.
- Provide specialist services, such as safe houses, for TG groups at risk of homelessness, particularly young people and the elderly.
- Provide affordable and non-discriminatory housing options for TG people.
- Take account of the needs of TG communities for safe housing.

7. Lastly, the State of Kerala does not have any inscribed history of the TG community, documenting the milestones or journeys of the TG community. The only available documents are related to the recent developments especially after 2015, the introduction of Kerala Transgender Policy. So as part of the research and new initiatives taken up in the Gender Park, if there is a possible way to collect and document their history and journey so far, it would bolster the narrative around the community.

CHAPTER 4.4

SOCIAL PROTECTION TO INFORMAL LABOUR

Large number of workers who belonged to the traditional unorganised sectors in Kerala, remained subject to poor wages and working conditions. Also, a large share of such workers were self-employed and earned low returns. The Kerala Welfare Fund Act was enforced in 1975, whereby through a tripartite arrangement of the state, employers and employees, welfare funds were established and workers (and self-employed persons) belonging to various sectors were covered under welfare schemes that provided basic pension and contingencies. Currently 16 such welfare fund boards are functional, providing social security cover to workers.

All welfare funds run under a tripartite system with the employers, employees and government contributing to the fund. If there are no employers then the worker would be contributing a minimum amount to the fund. The welfare funds provide for various contingent social securities such as life course events, emergencies and old age pension.

Box 1 *Welfare Fund Boards in Kerala*

1. Kerala Bamboo Kattuvalli & Pandanus Leaf Workers Welfare Fund Board
2. Kerala Handloom Workers Welfare Fund Board
3. Kerala Beedi & Cigar Workers Welfare Fund Board, Kannur
4. Kerala Agricultural Workers Welfare Fund Board
5. Kerala Jewellery Workers Welfare Fund Board
6. Kerala Motor Transport Workers' Welfare Fund Scheme
7. Kerala Tailoring Workers Welfare Fund Board
8. Kerala Labour Welfare Fund Board
9. Kerala Toddy Worker's Welfare Fund Board
10. Kerala Abkari Workers Welfare Fund Board
11. Kerala State Unorganised Workers Social Security Board
12. Kerala Small Plantation Workers Welfare Fund Board
13. Kerala Head Load Workers Welfare Board
14. The Kerala Building And Other Construction Workers' Welfare Board
15. Kerala Cashew Workers Relief And Welfare Fund Board
16. Kerala Shops & Commercial Establishments Workers' Welfare Fund Board

Apart from the welfare fund boards there are programmes implemented by the Labour Department for welfare of the unorganised sector workers.

Box 2 *Welfare schemes for unorganised workers by the Labour Department*

1. Unorganized Daily Waged Employees Distress Relief Fund
2. Tree Climbers Disability Pension Scheme
3. Maternity Allowances to Workers in the Un-Organized Sector
4. Estate Workers Distress Relief Fund
5. Income Support to Workers in Traditional Sector Activities

- | |
|---|
| <ol style="list-style-type: none">6. The Unorganized Workers Social Security Scheme7. Better accommodation for plantation workers and affordable Housing for Un-organized Poor Urban Labour (BHAVANAM) |
|---|

These apart, schemes relevant to the guest workers are also being implemented. This is mentioned in the section below. The welfare fund model has been accepted by the national government that has extended a similar model through the Unorganised Workers Social Security Act 2008 of the Government of India.

The welfare funds and social security is of crucial importance to the labouring class. Of course, the direct benefit is the security workers get against various vulnerabilities. Such securities enhances the reservation wages of the workers and hence they would be in a position to bargain better in the labour market. These securities thus extend the agency of the workers to negotiate for better working and living conditions.

However there are a number of problems that needs to be addressed to make this model sustainable. Firstly, not all Boards provide the same welfare benefits. Some Boards are cash rich due to the contributions made by the workers and hence are able to provide better welfare benefits while some are not. There is need to bring all the Boards under a single viable body. However, these attempts have been opposed due to political interference. Also, because some of the Boards are cash poor, their sustenance is also becoming difficult. In some Boards, the cost of running the Boards are higher than the welfare funds being disbursed. Certainly alternative methods must be brought to make the Boards more sustainable.

CHAPTER 4.5

FOOD SECURITY AND PUBLIC DISTRIBUTION IN KERALA

Kerala is a food deficit state and has long been remained deficient in the production of food grains. Of the total requirements of food grain only about 15 percent is produced in the state. With respect to its staple food, rice, the deficit keeps on increasing: it was around 55 percent until the mid-seventies and since then it has increased steadily reaching as high as 75-80 per cent of its requirement. In the case of vegetables, the state heavily relies on neighboring states. Area under cultivation for paddy and food grains has seen a sharp decline over the past decade, though the productivity over the past two years has remained almost constant, mainly due to the reduction in area sown more than once. Agricultural land-use changes in Kerala are marked by an initial increase in gross cropped area followed by area decline in the last one decade. Though Kerala's GDP growth and agricultural production have increased over the past years, hunger and starvation still persist among the poorer sections of the population.

Although Kerala is high in the achievement scale of education, healthcare facilities and awareness among beneficiaries, unless food and nutritional security of the most vulnerable sections of the population is addressed, it would be difficult to fulfil the aim of a hunger-free Kerala. There are various schemes, State and Central, in the State for poverty alleviation. Kerala has a Public Distribution System (PDS) with a wide coverage. Besides this there is the Integrated Child Development Scheme (ICDS) and Mid-Day Meal schemes, which approach food security through a life cycle approach. They need further strengthening, integration, modernisation and monitoring.

PUBLIC DISTRIBUTION SYSTEM IN KERALA

The salient features of Kerala's public distribution system are its universal coverage, high level of utilization, physical access made possible through a vast network of retail outlets, rural bias and progressive utilization of the system. The origin of public distribution of food grains in Kerala can be traced back to Second World War. In order to make good the deficiency and to safeguard the interests of the common man against exploration by the private traders, a system of PDS has been in practice in the state as early as the pre-Independence days, which was discontinued for a short spell from 1954 to 1956. The State Government introduced an informal system of distribution of rice at subsidised rates to lower income group in 1957 and the system continued till October 1964. The state experienced acute shortage in the availability of rice in 1964 consequent on the restriction imposed in the movement of rice by the southern states of India. Formal rationing was introduced throughout the state with effect from 1st November 1964.

Well-targeted and properly functioning PDS is an important constituent of the strategy for poverty alleviation. In order to make PDS more responsive to the needs of the poor, Targeted Public Distribution System was introduced in June 1997. In the TPDS, subsidies are restricted

to BPL households. A profound consequence of TPDS is that it is the central government that fixes the BPL population within a state.

Kerala has got one of the most effective and best-run public distribution systems in India. Prior to the 1997 introduction of the targeted system, Kerala was the lone state in India that had an almost total coverage of Public Distribution System (PDS). The TPDS has affected Kerala's PDS in several ways. First, as 25 per cent of Kerala's population have been termed BPL by the Planning Commission, the guaranteed and subsidized allocation of grain for BPL households under the TPDS accounts for only 10 per cent of the previous PDS supply. Given that Kerala is a food deficit state, in the pre-TPDS period, the state's own production accounted for 20 per cent of grain requirements, the PDS accounted for 32 per cent and the rest came from private trade.

Secondly, the main flaw is that in the approved list of BPL families (targeted beneficiaries) certain non-eligible have found place whereas the 'real' eligible have been left out. It has been found that the criteria for inclusion in BPL list are solely economical which is often understated. There are complaints that persons having political patronage have found a place in BPL list. A large number of the very poor are in the APL category and are thus denied their right for subsidized food grains from PDS. The Kerala government has identified 42 per cent of households as BPL households and is providing the BPL subsidy to these households from the state budget. Government has continued to provide additional grain to BPL households as well as maintained its entitlements for APL households. There is a state subsidy on sales to APL households too.

Thirdly, off take from the PDS has declined. As compared to an annual off take of rice and wheat of around 2 million tonnes in 1991 and 1992, the off take in 1999 was 1.6 million tonnes and in 2000 it fell further to 0.71 million tonnes.

Fourthly, there is evidence that ration shops are becoming unviable and closing down. With the higher APL prices, ration shops have lost their advantage in relation to private stores for the majority of the population and it is reported that people have begun to shift to private traders. As compared to a monthly sale of 7500 kg of rice and 2000 kg of wheat in early 2000, fair price shops are now selling 1400 kg of rice and 200 kg of wheat a month. Since sales from fair price shops have declined, many are estimated to be making losses.

Finally, the distinguishing feature of TPDS is that it has a dual central issue price: prices for BPL consumers and prices for APL consumers. A third price introduced in 2001, is for beneficiaries of the Antyodaya Scheme.

The Central Government has restricted approximately 11 lakh of families under the BPL list. At the same time, the State Government expanded it to 25 lakh of families and distributed rice through ration shops for two rupees per kg. Government intervention through numerous stores of the Civil Supplies Corporation and Consumer Fed, Maveli hotels and Co-operative stores, in fact, helped to curb the rate of price rise. And hence price for numerous food grains, vegetables etc. has become less than the producing states.

Table 1 Public Distribution System at glance

No of districts	14
No of taluks	81
No. of Interim Godowns	107
No of ARDs	14297
No of Ration Cards	86.30 Lakhs
No of AAY cards	5.89 Lakhs
No of PHH cards	31.01 Lakhs
Total NFSA Cards	36.90 Lakhs
Tide Over Cards	49.40 Lakhs

INSTITUTIONAL MECHANISMS

The Department of Civil Supplies was constituted initially as a part of the Revenue Department with a skeleton staff pattern. Later, on 01-08-1975, Civil Supplies was separated from the Board of Revenue and thereafter started functioning as an independent department. Being a food deficit State, the main role of Civil Supplies Department in the State was to deal with Public Distribution System (PDS), effectively to alleviate poverty and ensure food security. Kerala has a long history of PDS dating back to 1960's. With the promulgation of Kerala Rationing Order 1966, Universal and statutory rationing was introduced in the State from 01-07-1966. The PDS in Kerala is now functioning based on an understanding that considering the peculiar agro-climatic conditions and scarcity of land for agriculture crops, the Government of India will meet the food requirement of the State for ensuring food security through the Public Distribution System. As part of economic reforms, Govt of India decided to change the Universal Public Distribution System into Targeted Public Distribution System (TPDS) with effect from 01-06-1997. Under TPDS, families are classified as APL, BPL and AA Y. Each category is given distinctive ration cards. The quantity of allotment of food grains and price are also different for each category.

The objective of the Civil Supplies Department in maintaining supplies of essential commodities and securing equitable distribution and availability at fair price are being achieved through 14,246 Authorized Ration Dealers (ARDs) spread across the State. Besides there are 335 authorized Wholesale Depots and 293 Kerosene Wholesale Depots to cater to the ARDs. These are functioning in every nook and corner of the State at easy reach of every family.

The major functions of the department include public distribution, enforcement of market discipline, promotion of consumer awareness and protection of their interest.

MAJOR POLICY TRANSFORMATION

The Government has taken major steps towards policy transformation. The following are key policy transformation implemented.

NATIONAL FOOD SECURITY ACT, 2013 IMPLEMENTATION

NFSA covers up to 75% of the rural population and 50% of the urban population under Antyodaya Anna Yojana (AAY) and priority households. While AAY households, which constitute poorest of the poor, are entitled to 35 kg of food grains per family per month, priority households are entitled to five kg per person per month. Corresponding to the all-India coverage of 75% and 50% in the rural and urban areas, State-wise coverage under NFSA was determined by the erstwhile Planning Commission (now NITI Aayog) by using the NSS Household Consumption Survey data for 2011-12. Kerala has got coverage of 52.63 % in rural area and 39.50 in urban area.

The National Food Security Act (NFSA), 2013 was introduced by the GoI to ensure food security for the vast majority of the population belonging to middle and lower classes of the society. The objective of the Act is “to provide food and nutritional security in human life cycle approach by ensuring access to adequate quantity of quality food at affordable prices to people”. Under the NFSA-2013, the State Government shall be responsible for implementation and monitoring of the schemes of various ministries and departments of the Central Government in accordance with the guidelines issued by the latter for ensuring food security to the targeted beneficiaries of the State. In pursuance of the National Food Security Act 2013, Government of Kerala has decided to implement NFSA in the State with effect from 01.11.2016.

BENEFICIARY IDENTIFICATION

The Government of Kerala took measures to identify eligible households. In Kerala, the process of renewal of existing ration cards coincided with the statutory provisions of the NFSA. As mandated in the NFSA, “priority” and “non-priority” ration cards have replaced the BPL and APL cards respectively. A State-wise ranking of the beneficiaries was also conducted. Kerala has successfully implemented NFSA 2013 as per the norms suggested by Government of India.

SUPPLY CHAIN MANAGEMENT

Supply-chain management and door-step delivery of food grains (from intermediary State-owned godowns up to the door-step of ARDs) has now been entrusted to SupplyCo, who has been appointed by the Government as the authorized agency and system integrator for this purpose. SupplyCo established taluk-level intermediary storage godowns and e-tender has been floated for selection of transporting contractors for lifting and doorstep delivery of food grains. GPS tracking of the transportation vehicles is still lagging behind. As the first phase, all these were implemented in Kollam district, which followed a rollout throughout the State.

FPS AUTOMATION

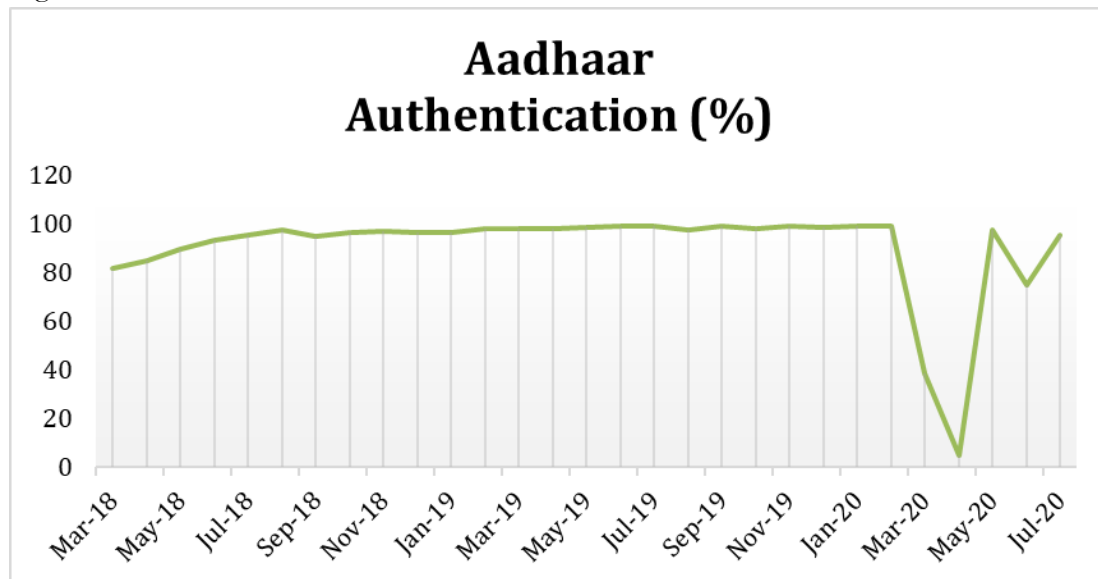
Fair Price Shop (FPS) has been automated through the implementation of electronic point of sale (ePoS) device. Ration distribution happens through beneficiary’s Aadhaar authentication, and food grains accounting happens at real time basis on a central system with transactions details available on the public domain. Aadhaar authentication ensures that genuine beneficiaries are availing food grains from FPS. Kerala has got good Internet connectivity in both urban and rural areas. This also helped to achieve higher percentage of successful Aadhaar authenticated transactions. Table 2 shows percentage of Aadhaar authentication.

Table 2

Details of Monthly e-pos Transactions & Aadhaar Authentications		
Month	Total No.of Cards in the State	Aadhaar Authentication (%)
Mar-18	7002895	81.55
Apr-18	5897667	84.54
May-18	8024449	89.47
Jun-18	8025031	93.16
Jul-18	8069162	94.93
Aug-18	8819639	97.13
Sep-18	8087076	94.63
Oct-18	8092721	96.07
Nov-18	8111102	96.53
Dec-18	8133132	96.28

Jan-19	8240738	96.08
Feb-19	8351248	97.75
Mar-19	8412615	97.63
Apr-19	8504302	97.85
May-19	8539387	98.34
Jun-19	8563102	98.59
Jul-19	8579608	98.61
Aug-19	8819639	97.13
Sep-19	8614380	98.79
Oct-19	8626401	97.82
Nov-19	8643619	98.53
Dec-19	8665180	98.31
Jan-20	8682960	98.74
Feb-20	8697290	99
Mar-20	8714294	38.17
Apr-20	8728831	4.79
May-20	8729875	97.45
Jun-20	8749361	74.65
Jul-20	8792169	95.25

Figure 1



Note: Aadhaar authentication percentage is for the month of April 2020 reduced because of Covid-19 pandemic, when Aadhaar authentication was stopped.

GRIEVANCES REDRESSAL SYSTEM

The Department has developed an online Grievance Redressal mechanism for registration and tracking of grievances. A call centre/toll free helpline numbers (1967 and 1800-425-1550) for TPDS have already been working with KSITM. Grievances can be registered via email-id: dir.sch@kerala.gov.in. NIC has customized a GR application newly prepared for LSGD, for the use of Department internally, as specified in NFSA, 2013.

TRANSPARENCY PORTAL

The existing website of the Department (www.supplycokerala.gov.in) has been developed into a Transparency Portal by NIC through which public can access information including allocation details.

APPOINTMENT OF STATE FOOD COMMISSION

Chairman and members of State Food Commission have been appointed for the purpose of monitoring and review of implementation of National Food Security Act.

REVISION OF FPS COMMISSION STRUCTURE

The Government constituted a committee with the Director Civil Supplies as chair and including ration dealers to propose a package. The Committee has recommended a model of Commission structure (What does this mean?). The Government of Kerala has agreed to a final package based on the Committee's recommendations subject to the condition that the EPOS (EXPAND) will be implemented before a new commission structure is implemented. A revised commission structure will boost the morale of FPS licensees to improve service delivery to the beneficiaries.

Standardisation of Fair Price Shops

The FPS has been standardized by putting the same color code (where?) and it is also mandated to put the stock and price list of commodities outside the FPS. Directions have been also given to FPS licensees to update the stock and price accordingly.



MILESTONES ACHIEVED

The following are the major milestones achieved during the process of PDS transformation.

DOORSTEP DELIVERY OPERATIONS

Supplyco has been entrusted with the implementation of the doorstep delivery of rationed articles under the PDS in Kerala. The food grains allocated to the State, either through Food Corporation of India (FCI) or from Compact Multi-Roller (CMR) mills have to be lifted from the respective godowns and delivered at the doorstep of the Fair Price Shops (FPS) after storage at interim godowns. At present the Corporation has started NFSA intermediary godowns in all 75 taluks in the State for storage of food grains lifted from FCI depots/CMR Mills. The Corporation has also hired 223 godowns with 15.0 lakh sq. ft. area, which can store about 2.5 lakh MT of food grains. Due to switching over to NFSA operations, the operations in the existing 11 sub-depots have been converted as NFSA godowns.

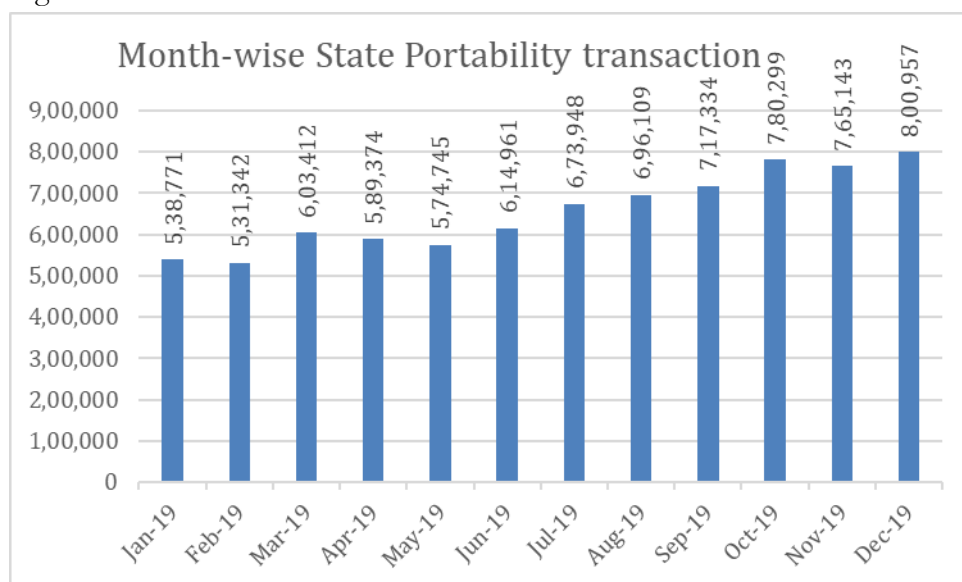
SUCCESSFUL IMPLEMENTATION OF ePOS ACROSS KERALA

Electronic point of sale (ePoS) has been implemented across Kerala in a time-bound manner. Proper training has also been imparted to FPS licensee and department official on the operations of ePoS devices. User manuals have been prepared and distributed to all FPS licensees. The Government has taken FPS licensees into confidence by increasing their commission structure after implementation of ePoS devices.

IMPLEMENTATION OF STATE PORTABILITY

The Government has implemented state portability to provide facilities to beneficiaries to avail of food grains from any shops within the state. Large number of beneficiaries availed portability option for their convenience and experienced good service delivery. FPS licensee can also improve service delivery to attract more beneficiaries.

Fig. 2



IMPLEMENTATION OF NATIONAL PORTABILITY

Kerala started the National Portability transaction from January 2020. Those states / UT who are participating in the National Portability cluster can avail food grains within the cluster states through Aadhaar-authenticated ePoS transaction. One Nation One Ration Card is one of the prestigious projects implemented by Department of Food and Public Distribution Government of India to facilitate food grains from any state where a ration cardholder resides. At present 20 states / UT have joined under the one Nation One Ration Card (National Portability) scheme. National Portability feature would support migrant labours to avail their food grains entitlement from anywhere they reside.

Table 3

Ration card holders from other States who availed food grains from Kerala (portability in)								
		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Sl. No	Name of State	No. of Transaction						
1	KARNATAKA	43	51	78	176	91	89	92
2	MAHARASHTRA	4	8	8	15	13	12	17
3	MADHYA PRADESH	0	6	0	0	0	1	0
4	RAJASTHAN	0	2	0	1	0	0	0
5	GOA	0	0	0	1	0	0	0
6	TELANGANA	0	0	0	1	0	0	0

7	UTTAR PRADESH	0	0	0	0	1	4	7
8	ANDHRA PRADESH	0	0	0	0	0	0	1
9	GUJARAT	0	0	0	0	0	0	1
	Total	47	67	86	194	105	106	118

Kerala Ration card holder who availed food grains from other states (portability out)								
		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Sl. No	Name of State	No. of Transaction						
1	KARNATAKA	1	0	1	3	9	2	0
2	ANDHRA PRADESH	0	0	0	1	0	0	0
3	GOA	0	0	0	0	0	0	1
4	UTTAR PRADESH	0	0	0	0	1	0	0
5	GUJARAT	0	0	0	0	0	1	0

SOCIAL AUDIT

The Government has introduced the practice of a social audit to bring in transparency and prevent pilferage in the public distribution system. The awareness levels of beneficiaries have been increased to demand their entitlements. Social auditing is the process through which we understand the gaps in the service delivery mechanism and can take measures to address the gap. Government plans to conduct social auditing by covering more areas to ensure that continuous improvement in the service delivery is achieved.

HUMANITARIAN CRISIS AND RESPONSE

Kerala witnessed many crisis situations such as Ockhi cyclone, Nipa virus outbreak, Flood and Covid-19. During such crises the government is able to decisively and very quickly take various steps to reach food grains to the affected beneficiaries.

Ockhi Response

Government of India had allotted a quantity of 3555 MT of Rice at MSP-derived rate to the state for distribution to the families affected by Ockhi cyclone.

Nine districts were affected by the cyclone, namely, Trivandrum, Kollam, Alappuzha, Ernakulam, Thrissur, Malappuram, Kozhikode, Kannur & Kasargodu. Those families were issued 15 Kg Rice per families free of cost. For this, 2918 MTs of rice was utilized. The total expense incurred in connection with the distribution was Rs. 9.24 crores and this was reimbursed from the Chief Minister's Disaster Relief Fund.

Expenses incurred in connection with distribution of OCKHI free ration is as follows. Cost of rice including weighment charge – Rs. 8,31,25903.

ARD Dealer Commission- Rs. 3,55,5000

Transportation Charge – Rs. 56,88000

Total – Rs. 9,23,68903 (9.24) Crores

Flood Relief Initiatives

Various flood relief measures have been taken to ensure all vulnerable beneficiaries are provided with ration food grains. The following table shows the brief on flood relief food distribution.

Table 4

Distribution details of Rice towards flood Relief during 2018							
District	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Rice distributed to Plantations on labours during aug & Sept 2018	Total Rice Distributed
Thiruvananthapuram	0	1756.017	1867.885	1838.284	1527.316	45.21	7034.712
Kollam	0	1274.736	1343.525	1233.801	1321.086	42.672	5215.82
Pathanamthitta	443.57	932.489	603.44	720.881	575.25	78	3353.629
Alappuzha	2169.941	1133.424	1164.723	1168.514	1187.422	0.525	6824.549
Kottayam	1891.04	1078.611	1128.813	1075.22	805.033	137.444	6116.16
Idukki	898.579	633.776	521.356	474.153	485.327	350.456	3363.647
Ernakulam	2830.448	1701.623	1827.066	1763.453	1780.557	10.947	9914.094
Thrissur	3165.018	1832.809	1880.538	1703.228	1747.559	37.725	10366.876
Palakkad	1600.94	1378.309	1394.394	1372.639	1322.753	15.347	7084.382

Malappuram	2717.0 4	1923.4 53	1987.7 5	1971.1 05	1914.7 21	53.314	10567.38 3
Kozhikode	2385.5 25	1665.6 37	1734.0 85	1642.1 82	1739.2 1	13.845	9180.483
Wayanad	889.05 3	439.54 4	440.52 7	433.91 5	440.77 4	107.135	2750.948
Kannur	236.73	1650.5 9	1691.4 69	1673.4 5	1670.9 15	5.112	6928.266
Kasaragod		672.32 7	716.43	706.38 5	701.13 4	11.535	2807.81
Total	19227. 88	18073. 34	18302	17777. 21	17219. 06	909.267	91508.75 9

PDS and Covid-19 Response

Now, the State of Kerala is witnessing an unusual situation in the food sector, for the first time after its formation in 1956, due to COVID-19 disease pandemic outbreak in January 2020. Even though Kerala has a strong Public Distribution System, a low food production rate is adversely affecting the food security of the State. In Kerala, the coverage of ration cards is almost total. A large number of people depend on PDS for food grains, so it is very important to maintain the momentum of the PDS. By using the infrastructure and the deep-rooted network of the PDS, Kerala was able to overcome the crisis generated by the COVID-19 outbreak and the lockdown imposed by the Central and State Governments to control the spread of the pandemic.

By completing all the provisions under NFSA-2013, the PDS in Kerala is likely to undergo radical change. The project to connect the e-pos machine with the weighing machines has been finalized. It was at this stage, i.e., in early January 2020 that the first Covid case was reported in Kerala. We realized that a lockdown would hamper the movement of essential commodities to Kerala including food grains. Indeed, if freight had been there could have been extraordinary inflation along with food shortages.

Kerala handled the situation with proper planning. Fully automated FPSs with e-POS machines, online allocation systems, effective supply chain management, well categorized beneficiary data and smart grievance redressal systems helped our State successfully implement activities in response to COVID-19 related emergencies. For the first time in the history of state's public distribution system, more than 97 percent of the beneficiaries availed their ration allotment during the lockdown.

PDS TRANSFORMATION – IMPACT ON STAKEHOLDERS

The changes in the PDS projects in Kerala helped to achieve numerous advantages to all stakeholders included in the value chain.

Table 5

Sl. No	Stakeholders	Advantages
	Executives	Executives can take informed policy level decisions based on customized MIS (EXPAND) reports and can also understand effectiveness of scheme implementation.
	Administrators	Administrators can monitor state-level lifting and distribution status of food grains on real time basis.
	Department Officers	Department officials can monitor monthly lifting and distribution status and corrective measures could be taken proactively.
	SupplyCO	SupplyCo can plan doorstep delivery operations well in advance, and can also ensure time-bound delivery of food grains at FP.
	FPS Licensee	FPS Licensee can get real-time stock details, and transaction details with food grains accounting. Each month foodgrains are delivered at FPS so that FPS management becomes smooth.
	Beneficiaries	Beneficiaries are informed each month of their entitlement and billing details on the given mobile number. Portability also supports the beneficiary to choose their FPS based on convenience and service quality.

CONCLUSION

ROAD MAP FOR THE FUTURE OF THE PDS

There are various projects in the pipeline, which are likely to fructify in the next five to 10 years, which will add value to the stakeholders. These projects include development of scientific storage, implementation of the Hunger-Free Kerala project across the state, the diversification of the food basket in the public distribution system, building greater awareness among beneficiaries, and optimization of the supply chain.

Storage loss mainly arises due to loss of moisture, a prolonged storage period, varying climatic conditions, the bleeding/spillage of grains from gunny bags, bird/rodent infestation in storage complexes, sliding down/deterioration of stocks, and Fungus/insect infestation of stocks. To address storage losses, options for the construction/hiring of scientific storage units must be explored. The Food Corporation of India has mentioned the advantages of Steel silos with bulk handling facility as a highly mechanized and scientific way of bulk storage of food grains which brings in efficiency, flexibility of operations and prevents losses during storage and transportation. If food grains are stored in silos and transported in bulk, losses due to theft, pilferage and transportation would be negligible compared to food grains storage in bags in conventional warehouses. The requirement of land for silos is approximately 1/3rd of that required by conventional storage warehouses of same capacity, which is an added advantage. Moreover, silos can be operated round the clock. This would bring in flexibility and would improve overall efficiency. It would also contribute to improving the efficiency of railways as also creating an efficient Food Supply Chain Management System.

Hunger Free Kerala Project is a state government initiative under the 13th Five-Year Plan. In keeping with the UN Sustainable Development Goals for 2030, different districts in Kerala followed different methods of enacting the project. Some districts, like Thrissur, provided meals at subsidised rates and delivered meals to the elderly, while others, like Alappuzha, operate on a largely charity-based model, with customers allowed to pay whatever they can, or nothing at all, for a meal a day, in addition to delivering meals to certain identified beneficiaries. Government plans to implement the project across all the districts in Kerala.

More awareness must be created to beneficiaries on their entitlement. The Department has been widely publicizing various channels of grievances redressal that beneficiaries can approach for the resolution of their problems. Radio, television, print media and social media are being used to create more awareness among beneficiaries. Measures are also being taken to create awareness among migrants to avail their entitlement in their local language. The state also gives importance in diversifying the basket of food items for public distribution schemes. It is important that the number of beneficiaries and outreach of the public distribution system should be utilized to increase nutrition standards. It is desirable to add more food grains such as coarse grain in addition to rice and wheat.

Kerala Government is proactively taking various steps to increase agriculture production, 'Subhiksha Kerala' being the latest in the series. The 'Subhiksha Kerala' scheme as a flagship programme aims at large-scale production of paddy, fruits, vegetables, tubers, grains and legumes as part of making Kerala self-sufficient in food production. Various government departments are coordinating with farmers, youngsters, repatriated NRIs, Kudumbashree units and NGOs to disseminate the objectives of the scheme at the grass root level. The Government envisions a total revival of agriculture in the state. As per the programme objectives, within the next five years agriculture should be the major livelihood source and it must resolve food security concerns of the state.

In 2018-19, Hunger-free Kerala Project was re-named as 'Subhiksha' (Abundance). The first major step that has been taken up by the government is the conversion of fallow lands into farms. Initiatives have begun to convert around 25,000 ha of fallow land into cultivation of paddy and fruit crops through integrated farming, which would in turn increase production and income of the farmers. Various financial and technical facilities are provided to the farmers, farmer-producer organisations, Kudumbashree and co-operatives.

The Government has taken various measures to ensure inclusive implementation of the various food-based schemes such as Public Distribution System, ICDS and Midday Meal by covering all the vulnerable and eligible beneficiaries. It is also ensured that genuine beneficiaries are availing of their entitlements. Control and monitoring mechanisms have been strengthened to oversee the implementation of the scheme. More proactive measures are in the pipeline for the enhancement and continuous improvement of the food safety-net programmes. Scientific studies need to be conducted to optimize the food grains supply chain system to minimize transportation cost. It would also increase efficiency in route-planning and timely delivery of food grains at the defined locations.

CHAPTER 4.6

FOUR MISSIONS

The “Nava Kerala Mission” is the Kerala Government’s flagship programme to build a new Kerala through four Missions – LIFE Mission, Education Mission, Ardrum (Health Mission), and Haritha Kerala (Green Kerala Mission). The Missions emphasise sustainable development and people’s participation in the following fields:

1. high-quality school education;
2. people-friendly health facilities;
3. nature-friendly (including organic) agriculture;
4. waste management, a clean environment, and a litter-free Kerala;
5. clean water bodies and enhanced water resources; and
6. secure housing and livelihoods.

The LIFE Mission

The LIFE (Livelihood, Inclusion, and Financial Empowerment) Mission aims at constructing houses for the homeless and landless people in the State. It is a time-bound programme (2016-2021) that seeks to address the housing issue and to so improve the quality of life in the State. The Mission seeks to do so by not only providing homes with allied facilities such as anganawadis, palliative care facilities, old age care, and health care but also by raising the standard of living through skill-building, job-based training, employment opportunities and livelihood interventions. In addition to housing, LIFE Mission also aims at financial empowerment and the provision of livelihood opportunities to the beneficiaries. The scheme provides financial assistance of Rs 4 lakh per beneficiary for the construction of a house. This financial assistance consists of contribution from State Plan (Rs 1.2 lakh per beneficiary), Local Government Plan (Rs 80,000 per beneficiary) and a loan from Housing and Urban Development Corporation (Rs 2 lakh per beneficiary).

The Mission is implemented in three phases.

1. In the first phase, the Mission addressed the issue of incomplete houses, the construction of which was started under various housing schemes since 2000 but could not be completed due to various reasons.
2. The second phase of the Mission provided financial assistance for constructing houses to those who have their own land.
3. The third phase of the Mission is the rehabilitation of landless homeless beneficiaries of the State.

Estimation of Beneficiaries

In 2017, LIFE Mission conducted a survey with the support of Kudumbasree to identify the number of beneficiaries. The total homeless households in the State are 5.12 lakh, which includes 1.84 lakh having their own land and 3.28 lakh having no land.

Progress of Mission

Between 2016 and August 2020, 2,26,509 houses were completed under different schemes (LIFE Mission; Pradhan Mantri Awaas Yojana (a centrally sponsored scheme); schemes of other departments, mainly Scheduled Caste, Scheduled Tribe and Fisheries departments). In the first two years, that is between 2016-17 and 2017-18, the housing schemes of departments such as Scheduled Caste, Scheduled Tribe and Fisheries were implemented by the departments themselves. From 2018-19 onwards, these schemes were merged into LIFE.

Under Phase I, 54,158 unfinished houses were identified of which 52,298 houses have been completed as on August 2020. Under Phase II (that of providing houses to houseless with land) 1,03,243 beneficiaries were identified. Out of these, houses for 81,840 beneficiaries have been completed. The remaining construction work is under progress. Phase III of the Mission emphasises the apartment mode of housing complexes for landless and homeless beneficiaries. Out of 3,37,416 landless homeless beneficiaries who were identified by the Mission, those beneficiaries verified and found eligible are 1,19,712. Of them 1,761 beneficiaries have been provided housing facility as on August 2020.

As a pilot project, Bhavanam Foundation has constructed a housing complex at Adimali Grama Panchayat in Idukki District. This complex was taken up by the LIFE Mission at a cost of Rs. 24.82 crore. It is a seven-storey building and has 217 independent apartments, of which 163 are already occupied. Each apartment is of 460 sq.ft and has common facilities like lift, washing area, compost plant, health sub-centre, Kudumbasree counselling centre, youth club, gender club, and crèche. The beneficiaries would be provided with various livelihood training programmes very soon.

The Mission expected to complete a total of 101 housing complexes across the State under Phase III by the end of October 2020. Under the Care Home project, the Cooperative Department has taken the initiative to construct another 14 apartment complexes across the State. Moreover LIFE MISSION has identified another 56 locations in the State for the construction of apartment complexes.

The total number of houses completed upto August 2020 is given in Table 1 and expenditure details are given in Table 2.

Table 1

LIFE MISSION PROGRESS REPORT -COMPLETED HOUSES (as on August 2020)									
DISTRICT	PHASE 1	PHASE 2	PHASE 3	PMA Y (U)	PMA Y (R)	SC DEP	ST DEP	FISHERIES	TOTAL

						T.	T.	DEPT	
Thiruvananthapuram	6,045	13,332	58	8,696	2,977	2,290	2	1,233	34,633
Kollam	3,609	7,340	137	3,863	1,403	1,900	3	694	18,949
Pathanamthitta	1,171	1,791	125	980	696	1,112	544	-	6,419
Alappuzha	2,726	8,344	82	2,653	726	1,202	10	539	16,282
Kottayam	1,098	3,817	60	1,544	600	884	13	78	8,094
Idukki	3,007	8,753	519	1,464	759	798	114	5	15,419
Ernakulam	1,057	5,123	190	6,074	775	1,910	9	251	15,389
Thrissur	2,995	4,516	210	4,994	1,512	2,153	13	477	16,870
Palakkad	7,579	10,372	31	3,645	1,918	2,538	95	5	26,183
Malappuram	2,726	5,631	168	5,373	2,357	2,071	15	386	18,727
Kozhikodu	6,453	4,392	149	3,159	1,105	1,249	3	265	16,775
Wayanad	8,367	3,124	8	1,835	906	255	629	-	15,124
Kannur	2,638	2,279	18	3,074	692	482	279	165	9,627
Kasargod	2,827	3,026	6	1,091	570	403	16	79	8,018
Total	52,298	81,840	1,761	48,445	16,996	19,247	1,745	4,177	2,26,509

Source: LIFE Mission. Note*: Data upto August 2020 EXPAND ACRONYMS

Table 2 *Expenditure under LIFE Mission, 2016 to 2020, Rs in crore*

Phase	Source of fund	Amount
First Phase	State share	110.00
	LSGI (EXPAND) share	560.70
	Total	670.70

Second Phase	HUDCO Loan	1750.00
	LSGI share	1036.00
	State share	546.00
	Total	3332.00
Third Phase	State share	24.82
	GRAND TOTAL	4027.52

Note: Data up to August 2020

Education Mission

The Education Mission was initiated with the aim of bringing the best possible school facilities and education to children of all sections of our society.

The main objective of the Education Mission, better known as “*Pothu Vidhyabhasa Samrakshnam Yajnam*” (Public Education Protection Mission) is to raise the quality of teaching and learning in schools in the State. The focus is on the development of school infrastructure as well as enrichment of academic and social aspects of school education. The Mission has managed to bring together a wide range of persons, including teachers, parents, alumni, and people’s representatives towards the goal of creating high quality public educational institutions across the State. One of the first steps taken by the Government was to adopt four aided schools (which included Malaaparambu School WHAT IS SPECIAL ABT THIS SCHOOL?) which were facing the threat of closure, mainly on account of the commercial interests of certain school managements.

The objectives of the mission are to

1. Upgrade Government and Government-aided schools as Centres of Excellence that includes infrastructural as well as academic enhancement
2. Convert all classrooms from Standard 9 to 12 as hi-tech classrooms.
3. Provide learning experiences that generate secular, democratic and logical thinking among students
4. Develop language, communication and lifeskills of students.
5. Ensure creative people’s participation in the activities for the excellence of schools

Based on the targets and objectives, the activities of the Mission can broadly be classified into four categories – academic excellence, infrastructural development, high-tech classrooms, and people’s participation. These efforts have brought about a major transformation as concerns public-funded school education facilities in the State.

Increase in Enrolment in Government and Government Aided Schools

The programme to revive public education has led to an increase in enrolment in Government and Government-aided schools in the State. A total number of 5,04,851 new students got enrolled over three years from 2016 to 2019. This is a remarkable achievement when compared to the previous trend of declining enrolment since 1991-92.

Table 3 *Net increase in enrolment of students in schools from 2016-17 to 2019-20, in number*

Management	Standards							Total I to X
	I	II	III	IV	Total (I-IV)	V-VII	VIII-X	I-X
From 2016-17 to 2017-18								
Government	5703	3629	3615	2641	15588	5475	38789	59852
Aided	6495	6474	6296	5934	25199	58670	12844	96713
Un Aided	0	0	0	0	0	0	0	0
Grand Total	12198	10103	9911	8575	40787	64145	51633	156565
From 2017-18 to 2018-19								
Government	5784	5815	5603	5729	22931	12229	35484	70644
Aided	4294	8623	8546	7723	29186	67483	18658	115327
Un Aided	0	0	0	0	0	0	0	0
Grand Total	10078	14438	14149	13452	52117	79712	54142	185971
From 2018-19 to 2019-20								
Government	-168	5578	5483	5330	16223	12616	36376	65215
Aided	-3222	7626	7742	7266	19412	63312	15619	98343
Un Aided	0	0	0	0	0	0	0	0
Grand Total	-3390	13204	13225	12596	35635	75928	51995	163558

Source: Directorate of General Education, 2019

IT Enabled Education

As part of the hi-tech school project, IT enabled education facilities have been provided from classes VIII to XII (see Chapter on School Education)

‘Samagra’ e-Resource portal, a platform to enhance communication in hi-tech classrooms, has been launched and has caught on. The largest student IT Network in the country, “Little KITEs” IT Clubs have been established in 2060 schools and it has 1,15,344 members.

KITE’s Open Online course (KOOL), an online training programme has been started to give training to the teachers so that their working hours in schools will not be interrupted in any way.

‘Sametham’ portal is yet another platform prepared to provide the basic information regarding the schools of the state to the public. It provides information on the basic details of schools including its physical infrastructure, governing mechanisms, the approved classes in each school, details of students in each class, and teachers and non-teaching staff (without personal details). This is used to generate reports at various levels such as school, educational sub-district, educational district, revenue district and state level.

Improvement in School Infrastructure

There are 141 schools that have been raised as centres of excellence. These schools are funded by KIIIFB (EXPAND) and have been allocated Rs 5 crore. An amount of Rs 3 Crore each is allocated to 395 schools for revamping the basic facilities, and 446 schools are allocated Rs 1 crore each to develop the basic facilities.

Further, a project to give special recognition and financial support to legacy schools that were founded 200 and more years ago has been developed. A total of 141 Rashtriya Madhyamik Shiksha Abhiyaan (RMSA) schools are upgraded as Government Schools thereby creating additional posts to settle the scarcity of the teaching and non-teaching staff. The construction of the buildings of 52 RMSA schools have been completed, with the aid of NABARD, by utilising an amount of Rs104 crore.

Steps are being taken to modernize school libraries and laboratories.

Enhancement of Academic Excellence

Measures have been taken to distribute text books efficiently and in a time-bound manner. The text books are printed in three volumes so as to reduce the weight of the text books. All the text books for the prospective academic years are supplied to the schools before the closing date of previous academic year.

Sraddha, a programme to support the students from Class 3 to Class 8, who require additional academic support, has been initiated. As part of *Sraddha*, a special focus on mathematics has been envisaged by providing “operational mathematical skills” to the students who have not attained minimum essentials in mathematics.

Various interventions to enhance creativity have been set up, such as ‘Talent Lab’ and ‘Creative School Project’.

Ideal Lab Project has been started to make arrangements for labs of international standards in schools. These labs are set up in four different zones.

Samagra Shiksha Kerala (SSK) has designed several novel learning activities for school children with a view to address learning gaps which were identified in the National Achievement Surveys (NAS). Focusing on this agenda, several programmes like “*Malayalathilakkam*” (to enrich the talents of the students in Malayalam language), “Hello English” (to enhance the English language skills in the students), “*Sureeli Hindi*” (to nurture the Hindi language) have been implemented by the General Education Department under the ‘Learning Enhancement Programme’ of Samagra Shiksha Kerala. These activities have improved the language learning capacity of students. ‘*Kunjuvayana, Kunjezhuthu*’ programme is prepared to attain proficiency in mother tongue in learners from Class I to III. The NAS report of 2018 had raised concerns that primary students across the country were not achieving the basic learning outcomes and skills in Mathematics before reaching higher classes. Against this backdrop, in schools of Kerala, SSK has implemented the programme “GanithaVijayam” for primary students to strengthen their understanding of mathematical concepts.

For students with an aptitude for and interest in science, projects like ‘Sastrayanam’ ‘Sasthrajalakam’ and ‘Sastrapadham’ are being organised by SSK.

‘Teacher Transformation Course’ for higher secondary teachers is being conducted in various colleges across the State. This is a novel venture in India and the course is continuing successfully in many colleges and universities. ‘Disa-Higher Studies Expo’ has been arranged involving 53 universities and other higher education centres in India so as to help the students select centres for their higher education based on their interest.

Aardram Mission

The Aardram Mission was started to make government hospitals people-friendly by improving their basic infrastructure and capacity to provide services. The Mission aimed at upgrading the primary health centres (PHC) in the State to family health centres (FHC) and help in creation of new medical infrastructure in Government hospitals at different levels.

The major objectives of the Mission are as follows.

1. Patient friendly transformation of the outpatient (OP) wings of medical college hospitals and other Government hospitals.
2. Standardisation of the district and taluk level hospitals
3. Developing the primary health centres into family health centres in a phased manner.

4. Ensuring protocol based treatment guidelines in the management of patients in hospitals.

Family Health Centres

In the first phase in 2017-18, the Government identified 170 PHCs covering all the districts for conversion to family health centres. Additional posts of one medical officer, two staff nurses, and one lab technician each were created for each. These posts were filled up immediately in order to ensure that at least three doctors and four nurses are available in each FHCs. As on August 2020, 160 FHCs were functional and the rest were being set up. The transformation of PHCs into FHCs has evoked an encouraging community response. In 2019-20, 220 PHCs were selected for developing as FHCs. In 2020-21, 76 Community Health Centres are to be selected for converting into Block FHCs.

Service delivery of Health Centres in terms of clinical care and public health activities have been augmented and outpatient care is provided in the afternoon up to 6.00 pm. Through the implementation of the e-Health project, it is expected to further develop individual patient care plan and family health plan based on family health register data. Registration procedure for e-Health services has already been initiated. A ward and panchayat level health plan focusing on preventive, promotive and rehabilitative healthcare services is also being developed in association with panchayats and with public participation.

A new health volunteer system called Arogyasena has been launched as part of Aardram Mission. Public health interventions focusing on the reorganisation of the primary health care system based on the epidemiological needs of the people of Kerala especially in combating the non-communicable diseases is a focus area of the programme. Treatment guidelines for 53 common medical conditions to be managed at PHC level have been prepared and made available for Medical Officers.

Aswasam Clinics

‘Aswasam’ (‘Relief’) depression management in primary care was started in 170 Family Health Centres across the State. Health workers and staff nurses were trained in screening and in psychological first aid, while doctors were trained in diagnosis and management of depression at the primary care level.

Kerala COPD Prevention and Control Programme – SWAAS

Chronic Obstructive Pulmonary Disease (COPD) is one of the leading causes of mortality and morbidity worldwide. Kerala has taken the boldstep of formulating a COPD prevention and control programme in the country for the first time. The official declaration of the programme was done by the Honourable Minister for Health and Family welfare on February 7, 2017. The

SWAAS programme is implemented from the Family Health Centre level onwards in Kerala as part of Aardram Mission. Training has been given to the medical and paramedical staff of all the FHCs. The objectives of the Kerala COPD prevention and control programme is identification of COPD in the early stages of the disease, develop a structured programme for COPD diagnosis and treatment, and develop a system for generating information on disease burden of COPD which will aid in further planning and strategizing for COPD.

Patient Friendly Transformation of the Outpatient Wings of Government Hospitals

Considering the fact that medical college hospitals and district-level hospitals are larger institutions providing outpatient care for a large number of patients every day, patient friendly transformation of the outpatient wings of these hospitals were taken as a priority under Aardram Mission. It mainly included outpatient transformation with adequate OP registration counter, patient waiting area, adequate seating facility, token system with other amenities like drinking water, toilet facilities, public address system, information education and communication arrangements and signage systems. For ensuring quality medical care, OP computerisation, providing adequate facilities in the consultation rooms and a guideline-based case management is also part of this effort. These are being implemented in government medical college hospitals and at district level hospitals.

People Friendly OP Transformation of General/ District / Taluk Hospitals

There are 18 General hospitals and 18 District hospitals in the State. Out of this only 17 institutions have been selected for OP transformation (one hospital each in of the 11 districts and two hospitals from Kannur, Kasaragod and Wayanad districts). The construction work of seven hospitals has been completed. Out of the total of 86 taluk hospitals, 75 were selected for standardisation in a phased manner.

Medical Colleges at Trivandrum, Paripally, Alappuzha, Kottayam, Ernakulam, Thrissur, Malappuram and Kozhikode were selected for the implementation of OPD transformation. The work in eight Medical Colleges has already been completed.

Aardram People's Health Campaign

The *Aardram People's Health Campaign* was launched on November 18, 2019. Following the state-level launch, district-level and LSG (EXPAND) level launching of the campaign was started in all districts. The following five areas will be the focus of this people's campaign:

1. Preventive and promotive health and improvement in health-seeking behaviour.
2. Healthy Food
3. Exercise and physical activity promotion
4. Mental health and de-addiction (alcohol, smoking and substance abuse)
5. Cleanliness and waste disposal

Haritha Kerala Mission

The Haritha Keralam initiative is concerned, in the first place, with the disposal of solid waste and the cleaning of Kerala's water bodies. This has a "hardware" aspect in the scientific and technical infrastructure of such an initiative and a "software" aspect in its thrust in changing the consciousness of people, particularly children, towards the disposal of garbage and litter. Haritha Keralam envisages a litter-free Kerala in the near future.

The Haritha Keralam Mission has three sub-missions (i) sanitation and waste processing, (ii) water conservation and, (iii) agricultural development.

The main focus areas of the Haritha Keralam Mission are:

1. To formulate methods for various levels of coordination of Plans of Local Governments and other departments to address the major issues in each District.
2. To ensure scientific, efficient and technical advice to Local Governments in order to attain practical and effective technical facilities.
3. To provide leadership in conducting activities that ensure peoples participation and social inclusion for creating 'Haritha Keralam'.

Major Interventions

Sanitation and Waste Processing

Launched on August 15, 2017, the 'Freedom from Waste Campaign' created a strong foundation for sanitation and waste processing activities by Local Governments (LGs). The basic requirements for treatment of waste at source such as Material Collection Facilities (MCF), Resource Recovery Facilities (RRF), Haritha Karma Senas, household source-level treatment plants, and community composting units, have been provided to the LGs. The Green Protocol has become a part of social life and is implemented in 3,703 offices and institutions in the State, District and Block levels.

Forty-five per cent of bio-waste in the State is treated scientifically through source-level treatment of waste. These treatment systems were set up in 31.19 lakh houses. In addition, 1,320 industrial-level biogas plants, 97 community biogas plants and 2,020 community-level composting units were installed. Haritha Karma Sena units were formed in 1,033 LGs with the participation of 32,003 members. The 'Zero waste on ground' project was initiated in 170 wards in 17 Municipalities. A total of 9,708 tonnes plastic waste and 17,397 tonnes e-waste were collected and handed over for recycling. Further, 2,350 scrap merchants were registered in LGs. Thirty seven *Harithasabha* institutions have started functioning to give technical support for waste management facilities of LGs.

Material Collection Facility (MCF) centers and Resource Recovery Facility (RRF) centers were functioning in 674 and 128 LGs respectively between 2017-18 and 2019-20 (as on September 30, 2019).

Table 4 *Physical achievements in sanitary waste management, 2017-18 and 2019-20, in numbers*

SL. No	Particulars	2017-18	2018-19	2019-20
1	Number of Local Bodies where Haritha Karma Sena has been formed	521	512	1033
2	Number of members in Haritha Karma Sena	22592	9411	32003
3	Material Collection Centers (MCF) for Inorganic Waste Treatment	300	498	798
4	Resource Recovery Facility (RRF) Centres	39	181	220
5	Homes equipped with source waste treatment			47.91lakh
6	Collected Plastic waste handed over for recycling	200 tonnes	9508 tonnes	9708 tonnes
7	Collected E-waste handed over for recycling	400tonnes	16997tonnes	17397tonnes

Source: *Suchitwa Mission*

Water Conservation Mission

The water conservation mission envisions the renovation of existing water surfaces, ensuring pure and clean water in the local areas, and the spreading of a new culture for water consumption. This seeks to facilitate good quality water supply system for drinking and irrigation. In this sub mission, the ponds, canals and streams across the State are being cleaned up, protected and conserved. Considering the topography and the peculiarity of the landscapes, appropriate technology for water conservation is being adopted. In the hilly terrains where the flow of water is fast and the land is sloppy, small water harvesting bunds are constructed, enabling the dammed water to penetrate into the soil. Centrally-sponsored schemes such as Mahatma Gandhi National Rural Employment Scheme have been effectively synchronised with the projects of the local self-governing for the conservation of water. The physical achievements of water conservation sub- mission are given below.

Table 5 *Physical achievements with respect to water conservation, in numbers*

Sl no.	Particulars	2017-18	2018-19	2019-20	Total
1	Rivers rejuvenated	47 KM	155 KM	188 KM	390 KM
2	Streams rejuvenated	1391 KM	16747KM	23195 KM	41333KM
3	Wells recharged	16665	32271	4809	53745
4	Wells constructed	10399	4601	7252	22252
5	Wells renovated -		4625	9317	13942
6	Ponds renovated	3980	11401		15381
7	Ponds constructed		13738		13738

Agricultural Development

The agricultural development sub-mission has a special thrust towards organic farming. Systematic, scientific and comprehensive projects at each stage, from planning to marketing, are envisaged to strengthen the agricultural sector. A comprehensive farming initiative was introduced by integrating various subsidiary agricultural activities such as animal husbandry, beekeeping, poultry farming, goat rearing, and fish farming in a mutually complementing manner. The production and marketing of value-added products of the major crops of Kerala such as paddy, coconut, vegetables, jackfruit, and honey, has been carried out by establishing a chain of small and medium Agro Parks. Cultivation in barren lands is being promoted with the active participation of Self-Help Groups (Swayam Sahaya Sangam) and Joint Loyalty groups. The activities of the Agriculture Task Force (Karshika Karma Sena) are being strengthened in all the local self-governing institutions.

The 'Nava Kerala Karma Padhathi' is a concerted effort by the Government touching upon important aspects of social and economic development and has the potential to change the face of the State. The Missions have sought to address the most crucial issues that affect the lives of people. They have sought to build on the unique strengths of Kerala in the spheres of education and health. In fact, the Education Mission has consolidated the strengths of the State in the field of school education. The Mission brought about a major shift in enrolment from private schools to government and government-aided schools. While the Education Mission sought to build schools with modern hi-tech infrastructure, the Aardram Mission helped in developing modern infrastructure in hospitals and in creating a people-friendly health care system in the State. In

fact, the efforts of the Government in strengthening the health system are one of the reasons that helped the State in efficient management of the Covid-19 pandemic. Through LIFE Mission, the Government sought to provide decent housing facilities to all houseless and landless people in the State. Even though several housing schemes have been implemented in the past, they have not comprehensively addressed the needs of the landless and houseless as done by LIFE Mission. By adopting a convergence approach, and by completing the incomplete houses sanctioned in the past, LIFE Mission has made considerable progress in providing housing to the people in the State. The Haritha Keralam Mission, through its sub-missions, has made significant interventions to protect, clean and conserve our environment. It has created awareness among the people to preserve environment by rejuvenating water bodies and scientific management of waste. Overall, the Four Missions have helped in attaining new heights of progress in the sphere of social development and in improving the quality of life of people in the State.

CHAPTER 5.1
AGRICULTURE IN KERALA:
AN ASSESSMENT OF PROGRESS AND A ROAD MAP FOR THE FUTURE

I Introduction

Over the last 50 years, agriculture has had a special and unique place in Kerala's economy. To begin with, agriculture served as a driver of economic growth by expanding the size of the rural home market. It was the presence of high-value, commercial crops in the cropping cycle – spices, plantation crops and rubber – that helped raise Kerala's rural incomes substantially. In 2018-19, spices and plantation crops accounted for 23 per cent of Kerala's total value of output (VOO) from crops.³⁸ As a consequence, VOO per hectare of net sown area in Kerala was Rs 1745, which was comparable to Punjab's corresponding figure of Rs 1813.

Agriculture was also a successful contributor to structural change in Kerala's economy. In 2018-19, agriculture and allied sectors contributed only nine per cent to the Gross State Value Added (GSVA). Unlike India as a whole, this fall in agriculture's contribution to GSVA in Kerala was accompanied by a sharp fall in the number of workers employed in the primary sector; in 2018-19, only 19.3 per cent of the workers were employed in the primary sector in Kerala.³⁹

The logical question that arises, then, is what would/should be the future of Kerala's agriculture. Would it mirror the experience of the advanced capitalist world, where the agricultural sector's share has shrunk to less than three per cent of the economy, and where production is organised on corporate, industrial lines? Or, would the sector be able to modernise itself to organise agricultural production on a larger scale, but based on non-corporate, yet collective forms of production organisation and the adoption of advanced technology? Alternatively, would agriculture continue to retain the features of a small peasant economy, tied to a low yield-low income cycle and striving to protect the livelihoods of the landholders?

This paper does not offer to provide concrete answers to these questions. It attempts to provide an assessment of the agricultural sector in the State over the last decade and point to possibilities and challenges over the next decade. The objective is to ensure the consolidation of past gains, and to view the future from the shoulders of these gains. It is requested that this paper be considered as a broad statement of prospects and pathways, and not as a specific programme of action. This is submitted for broad-based discussion among farmers, scholars and activists, which in turn would facilitate the formulation of policies in the future.

³⁸ All figures on VOO are from the Central Statistics Office (CSO).

³⁹ The employment figures are from the NSSO's Periodic Labour Force Survey (PLFS) for 2018-19 as per the current weekly status.

II Major Features of Kerala's Crop Economy

Kerala's agricultural sector is marked by a set of features that sets it apart from other Indian States.

First, the share of non-agricultural area in the total geographical area of Kerala rose from about 7 per cent in the mid-1970s to about 12 per cent by 2018-19. Concurrently, the share of net sown area in the total geographical area fell from about 57 per cent to about 53 per cent. In addition, the share of fallow land (as a sum of current fallow, fallow other than current fallow and cultivable waste) in the total geographical area rose from about 1.7 per cent to 3.6 per cent.

This feature of Kerala's agriculture is significant. Due to the inflow of remittances and the sharp growth of the services sector, land is a highly valued commodity. Land prices in Kerala are one of the highest among Indian States. The demand for land towards non-agricultural purposes – construction of houses and non-farm establishments – is high. As a result, there is enormous pressure on agricultural land, and conversion of agricultural land into non-agricultural land has been taking place legally and illegally. Unless returns from agriculture rise faster than the returns from non-agricultural land, these trends are likely to continue and intensify over the next decade.

Secondly, within the land used for agricultural purposes, there was a shift from food grains towards non-food grains. From about 9.5 lakh hectares in 1970-71, the area cultivated with food grains fell to 2.9 lakh ha in 2004-05 and 2 lakh ha in 2018-19. The precipitous decline in the area cultivated with paddy was the major reason for the shift. While a part of the area cultivated with food grains was diverted to non-agricultural uses, another part was used to cultivate non-food grains. Thus, the area cultivated with rubber rose from 1.8 lakh hectares in 1970-71 to 4.7 lakh hectares in 1999-00 and 5.5 lakh hectares in 2018-19. The area cultivated with coconut rose from 7.2 lakh hectares in 1970-71 to 9.2 lakh hectares in 1999-00, though it fell to 7.6 lakh hectares by 2018-19.

Combined with the historical importance of crops like tea, coffee and spices, the shifts in the cropping pattern after the 1970s also implied that Kerala's fortunes in agriculture were determined largely outside its domains of influence. Thus, the free trade policies of the central government after 1994 had a strong adverse impact on Kerala's agricultural sector. The prices of most of the commercial crops became increasingly integrated with global agricultural prices. Further, many of the promotional schemes in these crops were designed and implemented through the commodity boards under the Ministry of Commerce. Under the policies of neoliberalism, budget allocations for these boards declined, and the production and marketing institutions supported by them were weakened. Such withdrawal has not just affected the sector adversely, but also burdened the State government with new responsibilities at a time when its own fiscal space was shrinking.

Thirdly, the nature of the work force involved in Kerala's agriculture has a specificity. Data from the Situation Assessment Survey (SAS), conducted by the NSSO in 2012-13, showed that only 27 per cent of agricultural households in Kerala reported agriculture as a major source of income. The corresponding share for India as a whole was 61 per cent. To put it crudely, Kerala has a

considerably smaller share of “full-time” farmers than in India; most are “part-time” farmers. This feature has a major influence on the extent of time, the amount of effort and the intensity of care given to farms. Most farms are maintained unscientifically leading to low levels of investment, productivity and income. This is also one reason why the extent of fallow land has risen over the years.

Fourthly, Kerala has a predominance of small and marginal farms; the average holding size, as per the Agricultural Census, is 0.18 ha or 0.4 acres. The smallness of farms is a major obstacle to farmers reaping the benefits of economies of scale as well as adopting modern technologies, particularly machines. Lower farm size is also a constraint in the aggregation of produce at the local level, which weakens the bargaining power of farmers in output markets. As a result, the producer’s share of the consumer’s rupee in Kerala’s agricultural value chains is low. While farmer’s collectives, such as cooperatives or farmer producer companies (FPC), can provide alternatives, their presence in the sphere of production is sporadic in the State.

Fifthly, given the rise in the share of non-agricultural manual labourers in the work force, there are complaints related to the shortage of agricultural labourers in Kerala’s farms. Such tightness in the labour market has also led to a rise in agricultural wages, which in turn forces farmers to reduce labour absorption in farms. Agricultural activities are adversely affected due to this constraint across crops, but particularly in the cultivation of labour-intensive food grain cultivation. This phenomenon demands rapid mechanisation of agricultural tasks. However, the small size of most farms and the absence of machines suitable for purchase or use in these small farms have meant that the density of use of implements in Kerala is lower than in other States.

Sixthly, though Kerala is blessed with 41 west-flowing and three east-flowing rivers, and has an annual rainfall of about 3000 mm, the extent to which it is able to retain, store and use these waters for agricultural purposes is grossly inadequate. The absence of adequate irrigation is one reason for the low productivity of crops. In addition, official data show a fall in the index of multiple cropping in the State. If the index of multiple cropping was 1.36 in 2001, it fell to 1.30 in 2011 and 1.26 in 2016.

In part, blame could be placed on the lop-sided emphasis on paddy cultivation in the design of irrigation projects; this led to disregard for the water requirements of other crops. But the historically inadequate emphasis in policy on small and medium irrigation projects, as well as minor-irrigation structures like check dams and lift irrigation projects, is also to be blamed. Further, the need for larger reservoir-like storage structures to store monsoon waters in the rivers in conjunction with smaller rainwater harvesting structures was never considered a priority item in previous plans in the State.

Seventhly, productivity levels are low in Kerala also because of unscientific and imbalanced practises related to fertilisation. *One*, compared to the major agricultural States of India, Kerala is one of the lowest fertiliser-consuming States in India. In 2018-19, Kerala’s consumption of N, P and K fertilisers was 36.4 kg per hectare, which was the lowest among all Indian States. The corresponding figure was 186.4 kg per hectare in Tamil Nadu, 126 kg per hectare in Maharashtra,

224.5 kg per hectare in Punjab, 173.3 kg per hectare in Andhra Pradesh and 161.1 kg per hectare in West Bengal.

Two, Kerala's consumption of N, P and K fertilisers has alarmingly declined over the last decade, from 106.2 kg per hectare in 2010-11 to 43.8 kg per hectare in 2015-16 and 36.4 kg per hectare in 2018-19. The implications of this decline for the sustenance of soil health has not been adequately studied.

Three, wide gaps exist between the requirement and sales of major fertilisers in Kerala. In September 2019, 3500 metric tons of Di-Ammonium Phosphate was required, while only 1831 metric tons were sold. Similarly, 11,000 metric tons of Muriate of Potash was required, but only 8339 metric tons were sold. On the other hand, 9000 metric tons of urea was required, but 11,578 metric tons were sold. Such imbalanced fertilisation, at wide variance from the official Package of Practices, has been a major constraint on the scientific practice of agriculture in the State.

Finally, while agriculture in Kerala is practiced in homesteads, marked by inter-cropping and multiple-cropping, most plan schemes of the government are crop-centred. More recently, the focus of the Department of Agriculture has turned into planning for agro-ecological units, which is commendable. However, the design and implementation of schemes continue to be crop-centred, thus defeating the purpose of formation of agro-ecological units. In addition, while livestock and fisheries are an integral part of the homestead system of farming, these components are part of different departments, which presents challenges in the convergence of activities at the ground level. The integration of the activities of agriculture and irrigation departments is also weak.

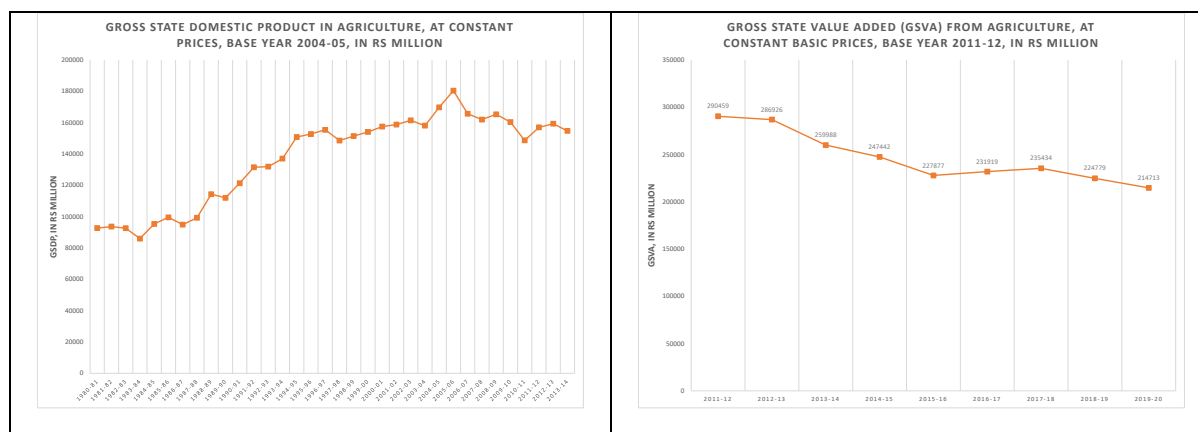
III Performance of Agriculture during the 12th and 13th Plans

The performance of Kerala's agriculture during the 12th and 13th plan periods were not encouraging. Relatively speaking, the performance of the sector during the 13th plan was better than during the 12th plan.

Trends in Gross State Domestic Product (GSDP), Gross State Value Added (GSVA) and value of output (VOO)

To begin with, we consider the data on Gross State Domestic Product (GSDP) and Gross State Value Added (GSVA) from agriculture in Kerala. We construct two series: the first of real GSDP between 1980-81 and 2013-14 based on the base year of 2004-05; and the second of real GSVA between 2011-12 and 2018-19 based on the base year of 2011-12 (see Figure 1). The GDP from agriculture began to rise from 1987-88 till 1997-98, and stagnated thereafter till 2013-14. The GSVA from agriculture fell sharply between 2011-12 and 2015-16. Between 2011-12 and 2015-16, the GSVA from agriculture fell by Rs 6258 crore in real terms. Thereafter, it stagnated and then fell again in 2018-19 and 2019-20 due to the adverse impact of the two major floods. In sum, there were no major stretches of growth in Kerala's agriculture after 1997-98.

Figure 1 Trends in GDP and GSV A from agriculture, Kerala, 1980-81 to 2019-20, at constant prices, in Rs million



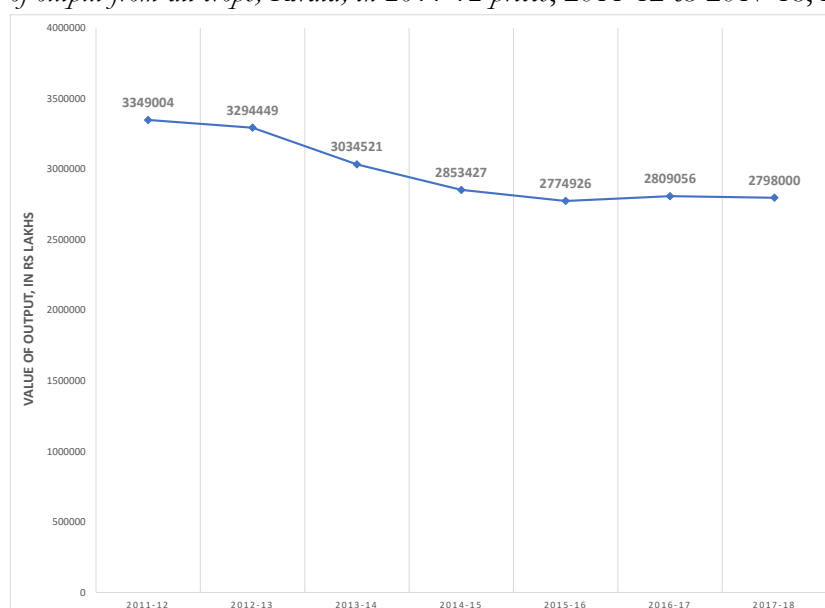
Source: CSO.

After 2015-16, as part of the conscious policy interventions under the 13th plan, the downward slide in agriculture could be halted. If floods had not hit Kerala in 2018 and 2019, the agricultural growth rate in 2018-19 and 2019-20 would have been positive and high. Estimates show that damages to the crops sector due to the floods in 2018 alone were to the tune of Rs 2,722.5 crore. These included destruction of irrigation systems and structures, destruction of crops, agriculture buildings and assets and soil degradation. Estimated production losses in the crop subsector were estimated at Rs 3,558.2 crore. About 89,610 ha of crops suffered. About 30,945 ha of perennial crops were destroyed; pepper, areca nuts, banana and coconut were the most affected. Over 109 million trees/plants were completely damaged (for details, see GoK, 2018).

In addition to GSDP and GSVA, we also use data on value of output (VOO) in agriculture put together by the CSO (see Figure 2). Here too, we see that the VOO fell between 2011-12 and 2015-16 by about Rs 5741 crore. There was no sign of revival at least till 2017-18.

Another interesting feature has been the declining share of the crop sector within the fortunes of the larger rubric of agriculture and allied sectors. If we consider GSVA figures, the crop sector had a share of 60 per cent in the overall GSVA in 2011-12 (see Table 1). This declined to 53.2 per cent 2019-20. On the other hand, the share of the livestock component rose from 23.3 per cent to 26.7 per cent. The share of fisheries component also rose from 7.8 per cent to 10.2 per cent.

Figure 2 *Value of output from all crops, Kerala, in 2011-12 prices, 2011-12 to 2017-18, in Rs lakh*



Source: CSO.

Table 1 *Share of GSVA from each component within the total GSVA from Agriculture, Forestry and Fishing, Kerala, 2011-12 to 2019-20, in per cent*

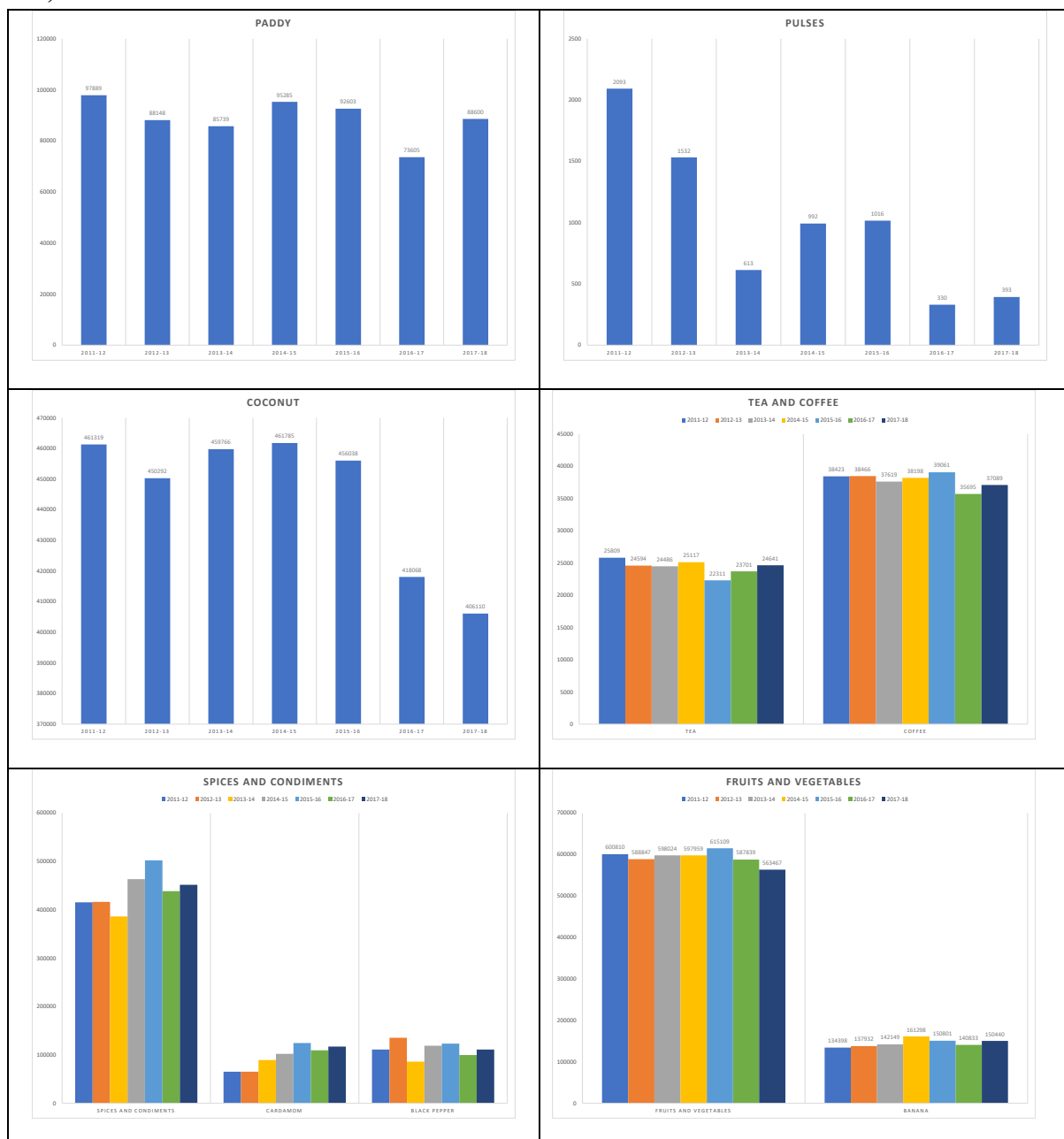
Year	Share of GSVA from each sector (%)				
	Crops	Livestock	Forestry and logging	Fishing and aquaculture	Total
2011-12	60.0	23.3	8.9	7.8	100.0
2012-13	58.5	25.1	8.8	7.7	100.0
2013-14	56.6	26.9	7.9	8.7	100.0
2014-15	53.8	27.8	9.0	9.4	100.0
2015-16	52.2	29.1	9.5	9.1	100.0
2016-17	53.5	27.1	10.1	9.3	100.0
2017-18	53.2	27.0	9.6	10.2	100.0
2018-19	52.0	27.0	9.9	11.1	100.0
2019-20	53.2	26.7	9.9	10.2	100.0

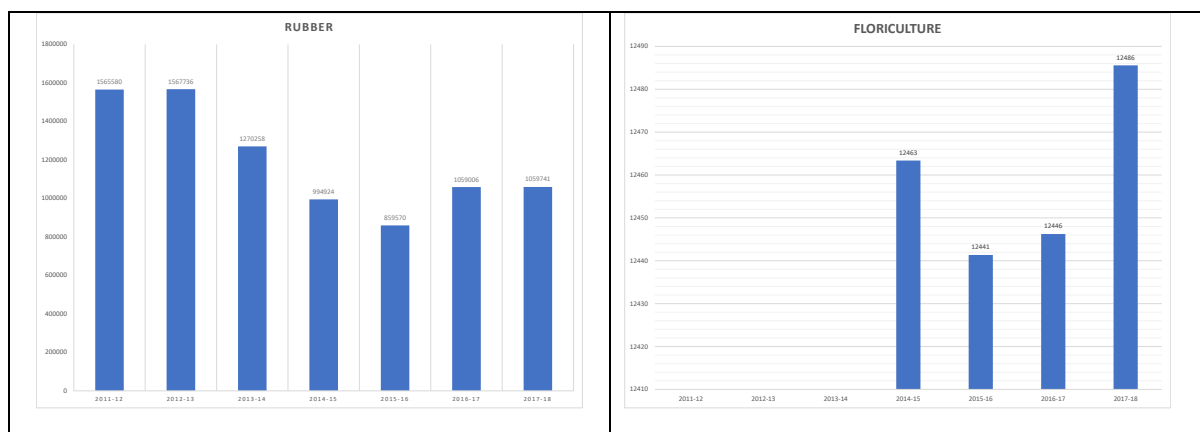
Source: CSO.

If we go by data on crop-wise VOO, most crops grown in Kerala were affected adversely by the downturn of agricultural growth after 2011-12 (see panel in Figure 3). The only exception appears to be spices and condiments, where a moderate growth was recorded due to a better performance in cardamom production.

If we go by data on quantity of production too, most crops other than cardamom suffered decline in production after 2011-12 (Figure 4). At the same time, there also appears to be a stemming of the decline, and even a marginal revival, in the production of some crops during the 13th Plan period. Examples are paddy, pulses, banana and rubber. We will reiterate the point that the floods in 2018 and 2019 were major setbacks to the efforts to revive production in agriculture during the 13th plan period. Production in many crops drastically fell in both the years. It may also be argued that in the absence of floods, production of many other crops too may have seen a revival. Of course, this remains a counterfactual and should not discourage efforts to see the crisis in agricultural production as it is.

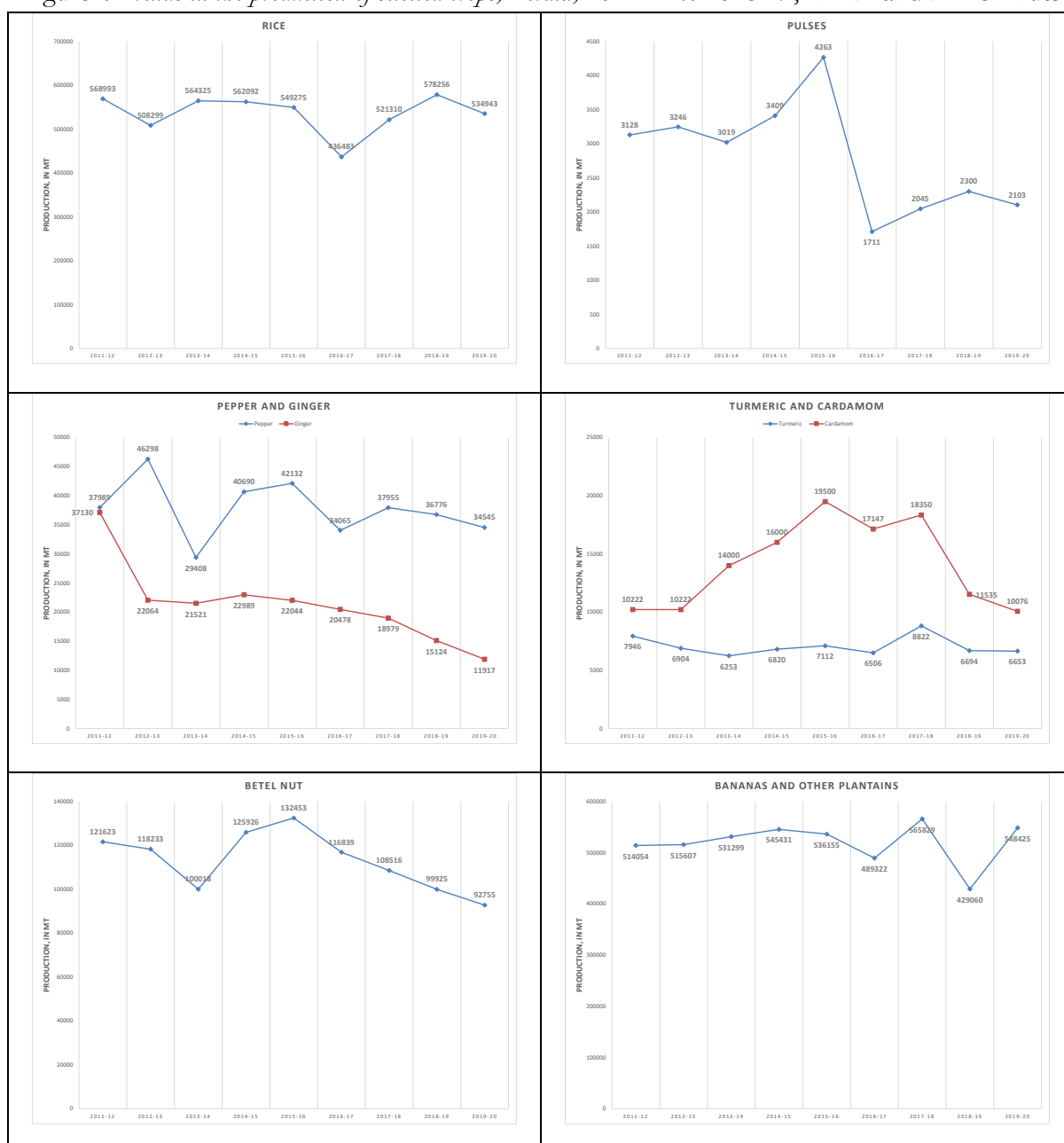
Figure 3 Trends in the value of output (VOO) in selected crops, Kerala, in 2011-12 prices, 2011-12 to 2017-18, in Rs lakh

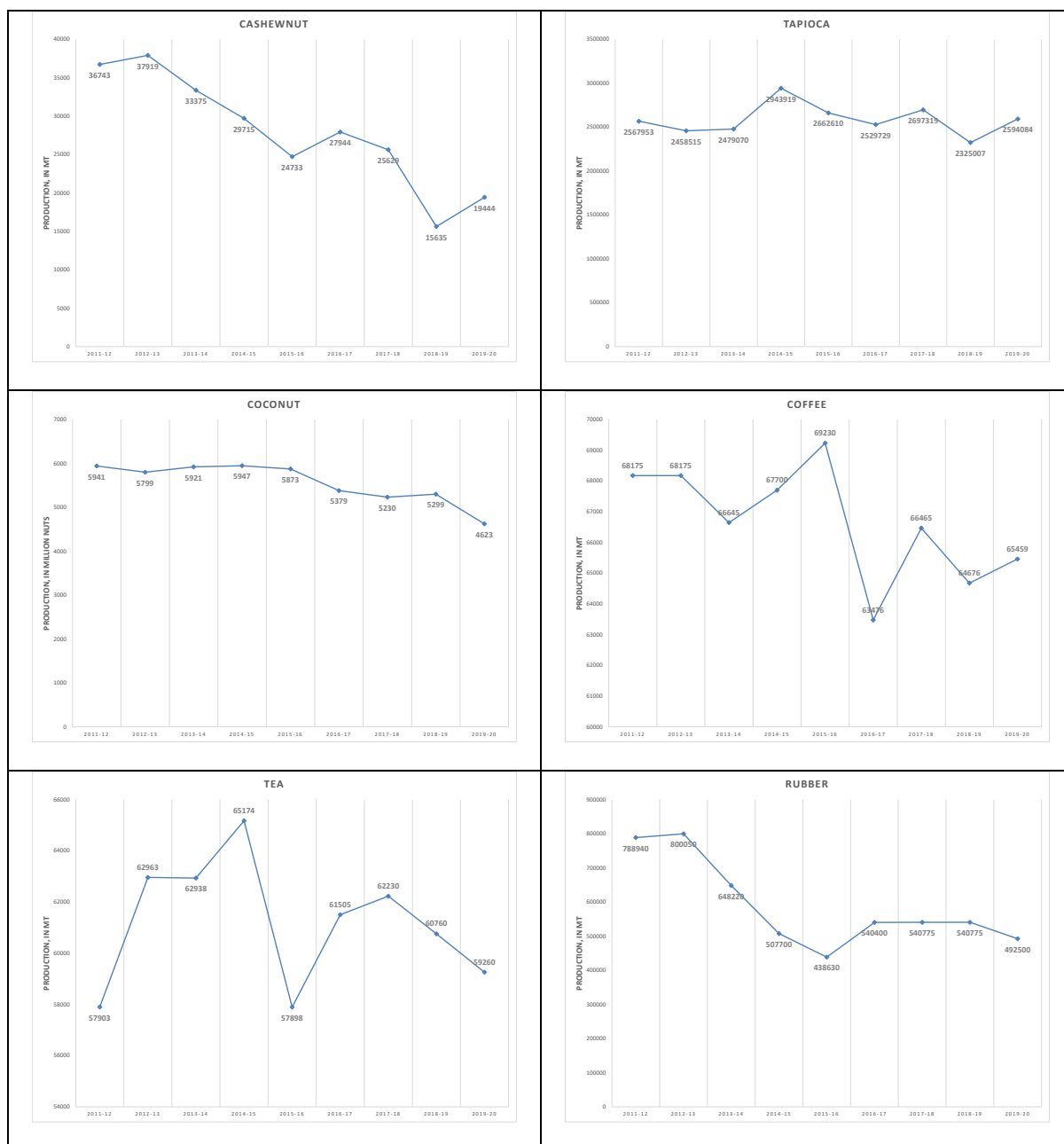




Source: CSO

Figure 4 Trends in the production of selected crops, Kerala, 2011-12 to 2018-19, in MT and million nuts





Sources: Department of Economics and Statistics; Coffee Board; Tea Board; Rubber Board.

There was a significant rise in plan and other allocations to the department over the 12th and 13th Plan periods (see Table 2). The allocation to agriculture from the plan schemes, including state and central sector schemes, the Rural Infrastructure Development Fund (RIDF) and the Rebuild Kerala Initiative (RKI) as well as under the Kerala Infrastructure Investment Fund Board (KIIFB; outside the plan), rose by 221 per cent between 2011-12 and 2020-21. The same was true for the allocation to the Department of Soil and Water Conservation and the Kerala Agricultural University. At the same time, expenditures have lagged behind allocations, and the crisis of State finances in Kerala after the floods of 2018 adversely affected expenditures in 2019-20. An improvement is expected in 2020-21.

In addition, spending in agriculture is also undertaken by local government institutions. The actual expenditure by panchayats in agriculture rose from Rs 67 crore in 2012-13 to Rs 285 crore

in 2018-19 and Rs 180 crore in 2019-20 (Table 3). If we add expenditures by the department and the panchayats, actual expenditures (not allocations) rose from Rs 775.4 crore in 2012-13 to Rs 1066.4 crore in 2018-19: a 137.5 per cent rise.

However, there appears to be a disconnect between the extent of plan allocations and the growth performance of the sector. We believe that a study should be initiated to assess the efficacy of plan expenditures in the agricultural sector to improve the efficiency of plan spending. This may be undertaken without any reduction in the extent of overall plan assistance to agriculture.

Nevertheless, we note two bright spots in the field of agriculture during the period of the 13th Plan. First, the downward slide in the area cultivated with paddy could be arrested. In 2015-16, 1.97 lakh hectares was cultivated with paddy in the State. In 2018-19, 1.98 lakh hectares was cultivated with paddy. This was in contrast to earlier plan periods, where the area cultivated with paddy consistently fell.

Table 2 *Allocation and expenditure under the plan schemes and through KIIFB in agriculture, nominal figures, Kerala, in Rs crore*

Year	Department of Agriculture & Farmer's Welfare					Department of Soil and Water Conservation				Kerala Agricultural University		
	Plan#	RIDF	RKI	KIIFB	Total	Plan#	RIDF	RKI	Total	Plan#	RKI	Total
(1) Allocation												
2011-12	494.9	5.0	-	-	499.9	4.1	13.0	-	17.1	45.0	-	45.0
2012-13	704.4	5.0	-	-	709.4	4.8	16.0	-	20.8	55.0	-	55.0
2013-14	803.3	5.0	-	-	808.3	5.6	20.0	-	25.6	60.0	-	60.0
2014-15	938.3	0.0	-	-	938.3	8.6	30.0	-	38.6	63.0	-	63.0
2015-16	626.9	5.0	-	-	631.9	8.4	35.0	-	43.4	63.0	-	63.0
2016-17	758.5	7.0	-	-	765.5	10.3	38.0	-	48.3	65.5	-	65.5
2017-18	894.6	7.0	-	-	901.6	11.6	40.0	-	51.6	75.0	-	75.0
2018-19	1016.9	10.0	-	14.3	1041.2	12.7	44.0	-	56.7	82.5	-	82.5
2019-20	1021.9	10.0	81.9	7.2	1120.9	13.8	44.0	60.9	118.7	82.5	8.0	90.5
2020-21	750.1	7.5	350.3	-	1107.9	12.1	33.0	-	45.1	71.1	-	71.1
(2) Expenditure												
2011-12	470.6	0.4	-	-	470.9	2.5	11.8	-	14.3	44.0	-	44.0
2012-13	673.9	5.0	-	-	678.9	4.0	16.1	-	20.1	54.0	-	54.0
2013-14	647.0	4.9	-	-	652.0	3.1	20.0	-	23.1	57.1	-	57.1
2014-15	731.4	4.2	-	-	735.6	8.6	29.0	-	37.5	33.5	-	33.5
2015-16	722.3	4.5	-	-	726.7	6.0	32.4	-	38.3	27.4	-	27.4
2016-17	732.1	20.1	-	-	752.3	5.9	40.7	-	46.6	42.2	-	42.2
2017-18	695.4	7.0	-	-	702.4	5.0	40.0	-	45.0	32.9	-	32.9
2018-19	764.8	6.4	-	-	771.2	3.0	17.0	-	20.1	21.3	-	21.3
2019-20	423.9	12.0	-	-	435.9	2.2	7.6	-	9.8	28.2	-	28.2
2020-21*	487.2	6.7	-	-	493.9	3.9	10.3	-	14.2	0.0	-	0.0

Source: Kerala State Planning Board.

Note: KIIFB allocations are not part of plan allocations; #: Plan includes plan schemes, central schemes and state share for central schemes; *: As on 21.10.2020.

Specific policy interventions of the State government, under which cultivation of paddy was encouraged with increased subsidies, a bonus over the minimum support price (MSP) and higher procurement, were instrumental in preventing a further decline in the area cultivated with paddy. Production of paddy too rose. The rise in production was mainly owing to a moderate rise in productivity from 2790 kg per hectare in 2015-16 to 2920 kg per hectare in 2018-19. In 2020, the government has announced an additional royalty of Rs 200 per hectare for wetland owners, as an incentive to not convert them to other uses or to leave them fallow.

Table 3 *Expenditure in agriculture by local government institutions, Kerala, nominal figures, 2012-13 to 2019-20, in Rs crore*

Year	Expenditure in (in crore)			Shares (%) of expenditure		
	Agriculture (A)	Production sector (P)	Total expenditure (TE)	A in P	A in TE	P in TE
2012-13	67	154	1250	43.2	5.3	12.3
2013-14	104	226	1942	46.2	5.4	11.6
2014-15	110	240	2153	45.7	5.1	11.2
2015-16	125	242	2401	51.6	5.2	10.1
2016-17	178	373	2041	47.7	8.7	18.3
2017-18	301	660	2750	45.6	10.9	24.0
2018-19	285	674	3330	42.2	8.5	20.2
2019-20	180	455	2445	39.6	7.4	18.6

Source: Kerala State Planning Board

Secondly, the success story of the 13th Plan was in vegetable production. Between 2015-16 and 2018-19, Kerala could nearly double the area cultivated with vegetables as well as production of vegetables (Table 4). The area rose from 46,500 hectares to 82,166 hectares and production rose from 6.3 lakh MT to 12.1 lakh MT. This growth shift is corroborated by data from the CSO on crop-wise VOO of vegetables in Kerala. The level of demand for vegetables in Kerala was estimated at 27.1 lakh MT in 2009-10 according to a report prepared by the NCAER. In 2030, the demand for vegetables is expected to rise to 35.5 lakh MT. In other words, Kerala could aim at one more doubling of production of vegetables over the 14th plan period. Of course, this would require a sharp rise in productivity as additional area available for vegetable cultivation is limited.

Table 4 *Area and production of vegetables, Kerala, 2015-16 to 2018-19, in hectares and lakh MT*

Year	Area (ha)	Production (lakh MT)
2015-16	46,500	6.3
2016-17	52,830	7.3
2017-18	69,047	10.0
2018-19	82,166	12.1

2019-20		
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Source: Department of Agriculture and Farmer's Welfare.

IV The Task in Agriculture

It is clear that Kerala has to focus on a rapid increase in production of its major crops over the next decade. Given that more area cannot be brought under cultivation, focus has to be to raise productivity. Rise in productivity requires a serious reliance on modern agricultural science, and a firm rejection of traditionalist methods that keep productivity levels low with no concomitant benefits to the environment. We shall expand on this argument below.

One of the important weaknesses of agriculture in Kerala is low productivity of most of its major crops. Productivity levels are low both in comparison with other States as well as with the maximum attainable productivity under scientific practises. The difference between the actual productivity and the maximum attainable productivity is termed the "yield gap".

There is a scarcity of systematically collected data with regard to yield gaps in Kerala. This paper puts together two sets of data, both from the Kerala Agricultural University (KAU) for the mid-2010s. The first was made available by the Directorate of Research at the KAU, and the second was made available by the Cropping System Research Centre (CSRC) of the KAU in Karamana (see Tables 5 and 6). In both tables, yield gaps are presented in percentages as the extent of improvement possible from the actual yield to reach the best realised (or potential) yield. That is,

$$\text{Yield gap (\%)} = \{[(\text{Potential yield} - \text{average yield})/\text{average yield}] * 100\}$$

Table 5 *Average and potential yields of major crops, Kerala, mid-2010s, in kg/ha, nuts/palm, kg/year*

Crop	Potential yield	Average yield	Yield gap (%)
Rice (kg/ha)	4500	2300	95.6
Coconut (nuts/palm/year)	150	40	275.0
Areca nut (kg nuts/palm/year)	25	7	257.0
Rubber (kg/year)	2000	1400	42.9
Pepper (kg/ha)	1500	295	408.5
Coffee (kg/ha)	2000	578	246.1
Tea (kg/ha)	5000	1706	193.1

Source: Directorate of Research, KAU.

Note: Data were compiled from internal sources and hence may not match with DES data. Potential yield corresponds to average best realised yield.

Both the tables bring out the appalling state of the levels of productivity of crops in Kerala. Broad averages compiled in Table 5 show that while rubber recorded the lowest yield gap, the yield gaps for the rest of the crops were in the range of 95 per cent to 409 per cent. Zone-wise data presented in Table 6 reiterate this conclusion in a disaggregated form. Compared to the highest yield in a farmer's plot in the same zone, the yield gaps for paddy ranged from 76 per cent to 146 per cent. In coconut, the yield gaps ranged from 186 per cent to 629 per cent. In pepper, the yield gaps ranged from 346 per cent to 500 per cent.

Studies have also shown that productivity levels of most crops in Kerala are significantly lower than in other Indian States (see GoK, 2016).

Further, productivity levels for many crops in Kerala declined between 2011-12 and 2019-20 (see panel in Figure 5). We need to discount the sharp fall in productivity of certain crops in 2018-19 and 2019-20, as these were years of major floods in the State. Overall, there were moderate improvements in the productivity of paddy, cardamom and tapioca. But in the rest of the crops, the productivity declined in varying degrees. The declines in pepper, cashew nut, coffee and rubber appear particularly worrisome.

In sum, the primary task of agricultural policy over the next decade has to be a focussed programme to raise productivity in the State.

Table 6 *Average, potential and best yields of major crops, by selected agro-ecological zones, Kerala, mid-2010s, in t/ha, kg/ha, nuts/palm*

Name of the agro-ecological zone	Crop and units	Yield in the zone	Yield in the district	Highest yield in a farmer's field	Yield gap (%)
Onattukara Sandy Plain	Paddy (t/ha)	2.7	3.0	6.5	145.3
Onattukara Sandy Plain	Coconut (nuts/palm/year)	52.0	40.0	160.0	207.6
Kuttanad	Paddy (t/ha)	4.3	2.6	7.5	76.1
Kuttanad	Coconut (nuts/palm/year)	41.2	29.0	300.0	628.9
Kole lands	Paddy (t/ha)	4.5	2.5	9.5	112.5
Pokkali lands	Coconut (nuts/palm/year)	35.0	31.0	100.0	185.7
Northern laterite	Pepper (kg/ha)	567.6	98.0	2750.0	385.0
Northern laterite	Paddy (t/ha)	2.3	1.5	5.0	117.4
Northern laterite	Banana (t/ha)	20.2	7.8	60.0	197.1
Northern hills	Pepper (kg/ha)	199.0	217.0	888.0	346.0
Northern hills	Coffee (kg/ha)	1031.0	705.0	1500.0	45.5
Central plateau	Pepper (kg/ha)	583.0	217.0	3500.0	500.0
Central plateau	Coffee (kg/ha)	1200.0	750.0	3000.0	150.0
Northern coastal	Cashew (kg/ha)	1100.0	1071.0	1800.0	63.6
Northern coastal	Areca nut (kg/palm)	1.3	0.9	3.6	176.9
Kaipad lands	Paddy (t/ha)	2.9	1.7	6.0	106.9
Southern high hills	Rubber (kg/ha)	1600.0	1499.0	2000.0	25.0

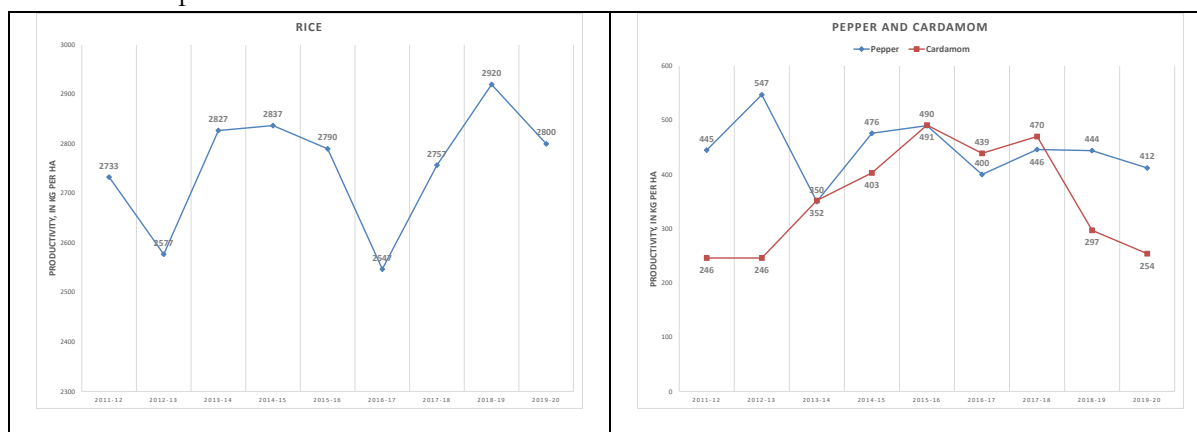
Southern high hills	Cardamom (kg/ha)	387.5	137.0	650.0	67.7
Southern central laterites	Tapioca (t/ha)	23.0	29.0	100.0	334.8

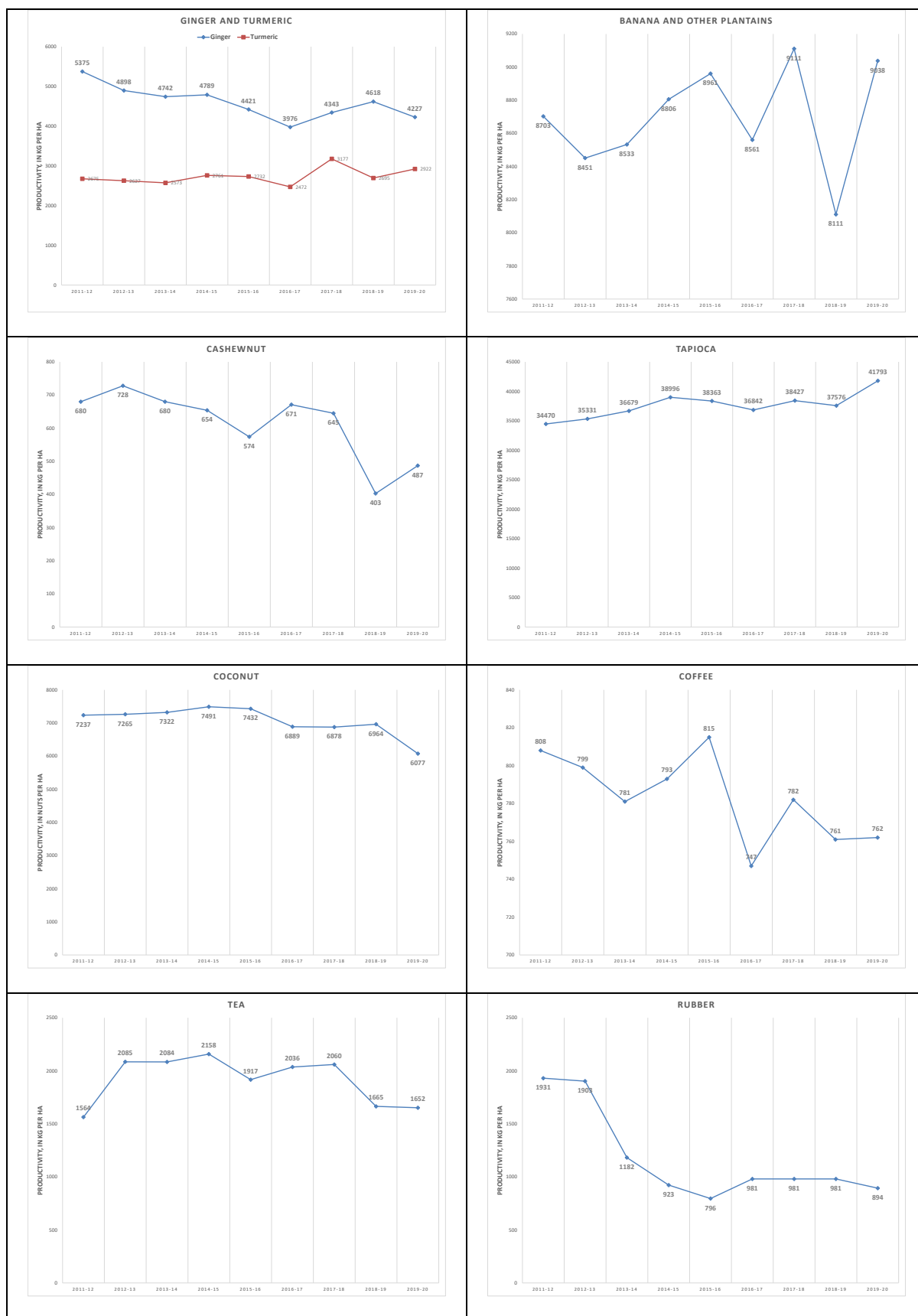
Source: CSRC, Karamana, KAU.

The focus of agricultural policy in the 13th plan was to concentrate on productivity, profitability and sustainability. Only if productivity improves can incomes be raised. Studies show that in the rainfed regions of the State, yield gaps can be closed with the existing technologies. Policy, and in particular the extension machinery, has to focus on better management of soil and water, wider adoption of improved varieties, availability of good quality certified seeds and balanced fertilisation and nutrient management. These studies also show that higher yield gaps are broadly correlated with poor adoption of technologies. For instance, the absence of or poor application of lime, chemical fertilisers, insecticides and fungicides was found to be common in regions and crops with higher yield gaps. The more recent introduction of planning for agro-ecological zones by the department is a welcome step; we hope that this will ultimately lead to improved and scientific formulation, design and implementation of departmental schemes.

It is only through the application of more and better science that agriculture can become sustainable. In Kerala, often, a common understanding propagated through sections of the media and unverified sources is that zero application of fertilisers and pesticides is the singular way to attain sustainability. Nothing can be more wrong and irrational. We have already seen that the consumption of fertilisers on a per hectare basis was the lowest in Kerala compared to other States and that it declined drastically over the last decade. In the case of pesticides, Kerala's consumption of pesticides is likely to be higher given the large areas under spices and plantation crops. Still, Kerala's pesticide consumption per 1000 hectares in 2017-18 was 0.41 MT, which was the same as the national average. The corresponding figures were 0.82 MT in Punjab, 0.62 MT in Haryana and 0.66 MT in Maharashtra.

Figure 5 Trends in the productivity of selected crops, Kerala, 2011-12 to 2019-20, in kg per hectare and million nuts per hectare





Sources: Department of Economics and Statistics; Coffee Board; Tea Board; Rubber Board.

Note: Rubber productivity in 2011-12 and 2012-13 was based on tapped area, and are not comparable with other years.

At this stage, we wish to draw attention to a number of misconceptions on pesticide content in food in Kerala. A common refrain is that food items in Kerala, especially vegetables, are increasingly “poisonous” (*visham* in Malayalam) and unfit for consumption. “Poison” in food has also been linked to the rising incidence of cancer in the State. A statement of facts may be in order.

In India, the Food Safety and Standard Authority of India (FSSAI) under the Ministry of Health and Family Welfare fixes Maximum Residue Limit (MRL) of pesticides in food keeping in view the dietary exposure and risk assessment. In science, there are globally accepted practices to arrive at the MRL.

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- At one end, there is the **NOAEL** (No Observed Adverse Effect Level), which is defined as the *highest* level of exposure to a chemical, determined in stringent animal toxicity tests, at which there was no observed toxic or adverse effect when one is exposed to the chemical in the long run. Numbers for animals are extrapolated to arrive at estimates for humans.
- At the other end, there is the **LOAEL** (Lowest Observed Adverse Effect Level), which is defined as the *lowest* level of exposure to a chemical at which there is an adverse effect.
- A third concept used is the **ADI** (Acceptable Daily Intake), which is defined as the maximum amount of a chemical that can be ingested daily over a lifetime with no appreciable health risk. The ADI is calculated by applying a safety or uncertainty factor, which is commonly 100, to the NOAEL.⁴⁰ That is, the long-term NOAEL (which is less than the LOAEL) is further divided by 100.
- Finally, we estimate the **MRL** (Maximum Residue Limit), which is defined as the maximum concentration of pesticide residue likely to remain as a result of the use of pesticides according to good agricultural practices (GAP) and product label recommendations. The MRL is estimated such that the total of the residue level accounts for less than 80 per cent of the ADI for that agricultural chemical. In other words, the ADI is reduced further by 20 per cent to arrive at the MRL.

There is a central sector scheme titled “Monitoring of Pesticide Residues at National Level” under which 27 accredited laboratories analyse samples of food items collected from retail outlets, APMC markets, mother dairy, organic outlets and farm gate for the possible presence of pesticide residues. The products covered are vegetables, fruits, spices, curry leaves, red chilli powder, rice, wheat, pulses, milk, fish/marine, tea, meat, egg and water. There are two laboratories in Kerala that undertakes this analysis: one at the College of Agriculture, Vellayani and the other at Marine Products Export Development Authority (MPEDA), Kochi.

In 2017-18, the Vellayani lab tested 1318 samples, of which 969 samples (73 per cent) had no detected residues and only 80 samples (6.1 per cent) contained residues above MRL. The Kochi lab tested 660 samples, out of which not even one sample contained residues above MRL. Let us

⁴⁰ The 100-fold safety factor is used to account for the differences in species and differences in toxicokinetics and toxicodynamics.

consider vegetables. The Vellayani lab tested 549 samples of vegetables, out of which 413 (75.2 per cent) had no detected residues and only 16 samples (2.9 per cent) contained residues above MRL. Data for Kochi lab were not available. At the same time, a certain number of samples in the Vellayani lab (21.3 per cent for all food items and 18.3 per cent for vegetables) contained residues of pesticides not approved for use on the respective crop.⁴¹ We are unable to assess what proportion of these samples had residues higher than MRL, as no MRL has been fixed by FSSAI for them. Indeed, the use of non-approved pesticides in agriculture has to be eliminated through better extension activities and awareness campaigns. At the same time, there is no evidence that any large proportion of food items available in Kerala's markets, particularly for vegetables, have residues of approved pesticides higher than MRL.

Further, even for the small proportion of food items with residues above MRL, the FSSAI has recommended a number of methods to reduce the residue levels.⁴² These include scrubbing, washing with water (about 75 per cent of pesticide residues can be removed with washing), washing with 2 per cent salt water or 1 per cent tamarind solution, vinegar soak, blanching and peeling. In addition, steaming and cooking of vegetables eliminate most of the residues that are not removed by washing or peeling.

In sum, we do not believe that any drastic steps are necessary to reduce pesticide consumption in Kerala's agriculture. We may also make note of the point that pesticide science has also advanced rapidly. The conventional pesticides were mostly highly toxic organophosphorus and carbamate compounds. New pesticides are products of advanced molecular research. These new generation pesticide molecules come with comparatively less toxicity, more effectiveness, specificity (narrow range) and low dosages. This also needs to be factored into our discussions on pesticide usage and impacts on health. At the same time, no effort should be spared to discourage and prevent the use of non-approved pesticides.

While the practice of organic farming can be popularised in niche spheres where premium export prices are available, this cannot be a generalised policy for the State. It might lock-in the State's agriculture into a vicious low yield-low income cycle, leading to more unscientific and irrational uses of land in the long-term. Balanced fertilisation and improved nutrient management based on soil-testing are what should be aimed at for better soil health. Integrated pest management practices, which include the judicious use of pesticides and fungicides, are what should be aimed at for better plant protection.

Globally, experience shows that reduced application of chemicals in agriculture can be achieved only through better research in the breeding of crop varieties resistant to pests and diseases. Advanced research in plant breeding should help us to develop varieties and hybrids that systemically require less application of chemicals. New applications in cutting-edge areas of research, such as biotechnology, gene editing (CRISPR) and nanotechnology, promise not just to reduce the use of chemicals, but also make available high yielding crop varieties resistant to viral

⁴¹ These non-approved pesticides are not illegal pesticides. They are approved by the Central Insecticide Board and Registration Committee (CIBRC). No chemical can be manufactured, transported and sold in India without the approval of CIBRC. Non-approved, here, implies the absence of label claims on the use of the specific pesticide on the specific crops referred to in testing.

⁴² See https://fssai.gov.in/upload/uploadfiles/files/Guidance_Note_Pesticides_04_02_2020.pdf.

diseases, acidity, alkalinity, salinity, flooding and high temperature. The State's agricultural research system needs to be geared up to meet this challenge.

V The Pathways to Growth

The future of Kerala's agriculture, as we underlined in the last section, has to be focussed on an increase in productivity, profitability and sustainability. Achieving this aim requires a major reconceptualization of agriculture in the policy sphere. We do not believe that this would require additional funding from the government. At the same time, we do foresee the need for a significant convergence of activities of the different players in the following fields: (a) encouragement of cutting edge research to develop high quality certified seeds; (b) improvement of soil health; (c) integrated water resources management to expand irrigation; (d) effective public agricultural extension to popularise balanced fertilisation and IPM practises; (e) adoption of mechanisation in agricultural operations; (f) modernisation of supply chains and marketing systems; and (g) large-scale investments in processing and value-addition.

In our attempts to ensure convergence in these aims, Kerala should utilise two features of institutional strength in its history: decentralised governance and the cooperative movement.

Role of Panchayats

Kerala initiated the People's Planning Campaign in 1996 after the passage of the 73rd and 74th amendments to the Constitution in 1994. A number of local activities and responsibilities related to agriculture were transferred to the local bodies. It was also specified that 40 per cent of the plan spendings of panchayat should be in the productive sector, within which agriculture constituted an important part (this was later revised to 30 per cent).

There were high expectations about the impact of decentralised planning on agricultural growth in the State. However, the introduction of decentralised planning coincided with a collapse of agricultural prices causing an unprecedented agrarian crisis in Kerala. Therefore, there can be no realistic assessment of the independent impact of decentralisation in agriculture at least over its first decade. The stagnation of agricultural growth, as we have seen in the last section, continued even after the acuteness of the agrarian crisis was contained after 2007.

A detailed official study in 2009 revealed that the target of 40 per cent of funds for productive sectors was not achieved in most local bodies for most years (see [GoK, 2009](#)). This adversely affected investment in agriculture. This study also noted a number of other problems with planning for agriculture in the panchayats. Agricultural programmes continued to be crop-specific, did not pay sufficient attention to land and water management, did not bring about innovations in agricultural practises and did not create new agrarian institutions. The other issues noted by the study included the lack of convergence and coordination across departments at the local level, poor quality of extension services through *krishi bhavans*, dual control of agricultural departments, insufficient integration of the needs of farmers and discussions in *grama sabhas* and the poor performance of block panchayats in agriculture (as in helping develop a regional

agricultural development policy). Many of these problems can be argued to be relevant in 2020 also.

A further problem is highlighted by data in Table 3. The share of production sector expenditure in total expenditure has consistently remained below 30 per cent. In fact, in most years after 2012, the share was below 20 per cent, and even just 10 per cent in one year. The share of agricultural sector in total expenditure was between 5 and 10 per cent. This is a major drawback of the decentralisation experience in Kerala. Even if 10 per cent more of the expenditure by local bodies enters agriculture, the total spending in agriculture could be raised by about Rs 200 crore a year.

In sum, though decentralisation was introduced to empower local communities and local institutions to plan the use of land-based assets, it by and large failed to achieve these objectives. This is not to devalue the role of panchayats in agricultural development, but a call to reform their activities and improve the content of their interventions in the sector. Decentralisation is too valuable a tool of public policy in Kerala to be squandered away.

The 14th plan period should be an appropriate occasion to reinvent the role of panchayats in agriculture. The panchayats should play a leading role in planning for agriculture at the local level, even as the block and district panchayats are given larger responsibilities to ensure that regional policies in agriculture are aligned to the needs of specific agro-ecological zones. We shall return to this topic soon.

Role of Cooperatives and Other Collectives

A key failure of Kerala's agricultural development has been its inability to create institutions at the local level that allow for the benefits of economies of scale in production and post-production activities. The small size of farms in Kerala means that farmers suffer from weak bargaining power in the input and output markets. Their produce is not aggregated at the local level; this leads to poor price realisation vis-à-vis traders but also leads to the absence of value-addition avenues, which in turn further dampens farm gate prices.

The group farming programme introduced in the late-1980s was an important attempt to introduce collective undertaking of selected agricultural operations, including the purchase of inputs and marketing of products. It proved to be effective in reducing costs in paddy cultivation. Later, the group approach was taken forward and consciously linked to more scientific cultural practices and adoption of technology in experiments like Group Approach for Locally Adapted and Sustainable Agriculture (GALASA). There were also interesting attempts to extend the concept of group farming into non-paddy crops like coconut and vegetables. However, none of these experiments could be taken forward and institutionalised.

This is where new collective agrarian institutions have to be created at the local level. In our view, given Kerala's rich history with the cooperative movement, creating multiple forms of farmer producer organisations (FPO) is the most appropriate path to go ahead. An FPO is a legal entity formed by primary producers in agriculture. An FPO can be registered under any of the following legal provisions: (a) Cooperative Societies Act/Autonomous or Mutually Aided

Cooperative Societies Act; (b) Multi-State Cooperative Society Act, 2002; (c) under Section 581(C) of Indian Companies Act, 1956, as amended in 2013; (d) a Section 25 Company of Indian Companies Act, 1956, as amended in 2013; (e) as Societies registered under Society Registration Act, 1860; and (f) Public Trusts registered under Indian Trusts Act, 1882. As is evident, in addition to the older form of cooperative societies, the Farmer Producer Company (FPC) is a new collective institution promoted from the early-2000s. Kerala has a number of FPCs in coconut cultivation – in Kannur, Palakkad, Malappuram, Kozhikode, Alappuzha, Thrissur and Kollam - that have been performing commendably over the last decade. These experiences have to be documented and demonstrated as success stories in other parts of the State.

There has also been a mushrooming of self-help groups (SHGs) and joint liability groups (JLG) that collectively undertake paddy and vegetable cultivation on lands leased in on lease. This new form of leasing should also be encouraged and the necessary legal changes should be introduced.

Similarly, to address the shortage of labourers, there were early experiments in the State with co-operative institutions for labour supply and management, such as the Labour Bank and the Labour Army. These too have not succeeded for various reasons. More recently, the State has tried to popularise *karshika karma senas*. The record of *karshika karma senas* is mixed. We need a careful evaluation of these *senas* that would provide us insights into how they can be popularised. We also need to design processes where *karshika karma senas* would work in better alignment and cooperation with agricultural offices at the local level. We also need to better integrate their activities with Custom Hiring Centres (CHC) for renting agricultural implements.

A plan for Integrated Action

1) The State government has already initiated a programme for cultivating all fallow lands in the State. In the next stage, this policy needs to be more scientifically designed. Land is a scarce and valuable commodity in Kerala, and it has competing uses in agricultural and non-agricultural sectors. This underlines the need for a **land use plan** in every panchayat. Such a land use plan should aim at the most efficient and sustainable use of every plot of land in the panchayat. The areas suitable and reserved for agricultural use, industrial purposes, public services, tourism and the no-construction zones should be delineated. While reserving areas for agricultural uses, care should be taken to consider soil health and potential for reclamation as important criteria.

2) Alongside land use plans, Kerala also needs **river basin plans** for all its 44 rivers. The Dutch expert team that studied Kerala's water situation after the floods of 2018 had recommended that Kerala should transform its water policy in line with the concept of Integrated Water Resources Management (IWRM), as part of which Integrated River Basin Management (IRBM) should be considered (GoK, 2018). IWRM emphasises a cross-disciplinary coordination of water, land and related resources in a river basin, watershed or catchment to achieve long-term sustainability. The aim is to focus on achieving healthy river ecosystems with wide-ranging benefits for all communities, economies and biological processes within it. The key components of the IWRM policy are identified as follows:

- (a) Cross-sectoral coordination in policy development, planning, and implementation of water related infrastructure.
- (b) Soil conservation and erosion protection in upper catchments.
- (c) River channel management in view of uncoordinated construction of permanent and temporary check dams and bunds for irrigation and domestic water supply.
- (d) Continuous repair of canal embankments (bunds), silted-up and polluted drainage canals, weirs, barrages, and spillways.
- (e) Formulation of, and adherence to, optimal protocols for dam operations with balanced consideration for downstream water demand, environmental flow, flood protection, and power generation.
- (f) Better management of coastal river outlets.
- (g) Improved polder management in regions like Kuttanad.

It should be as sub-sets of these river basin plans that panchayats should attempt development of integrated watershed management interventions. Each panchayat needs to develop an appropriate **watershed plan** aligned to the larger river basin plan applicable to that panchayat. Such plans have to be prepared for every micro-watershed. In 2000, every micro-watershed in Kerala was mapped, and brief reports on each of them presented before the *grama sabhas*, which elected the watershed committees. These watershed committees have become defunct since then. They have to be revived and strengthened with necessary expertise and information support to prepare micro-watershed plans. The watershed plans so drawn up should be approved by the District Planning Committee and the Kerala State Planning Board, as in most cases river basins cut across district boundaries. The annual choice of projects in the local bodies should be justifiable based on these river basin plans and watershed plans.

3) Once the watershed plans are developed, each panchayat needs to prepare a **crop plan** based on detailed soil tests in each region. The government already has a scheme to distribute soil health cards to each farmer. However, the progress under the scheme is tardy. We need to complete the distribution of soil health cards to all farmers of the State within a specified time frame. More soil testing centres should be established for this purpose. Every agricultural research centre in Kerala should have a soil-testing lab attached to it. Based on the results of these soil tests, and the prevailing agro-ecological conditions, suitable crops in each region have to be specified along with a plan for balanced fertilisation and sustainable plant protection. The KAU is already entrusted with the responsibility of developing package of practises for each of the 23 agroecological zones of the State. These documents can serve as a base document for the development of crop plans.

4) To assist in the larger programme for agricultural development, Kerala needs to upgrade its **agricultural research** infrastructure. Scientists at the KAU have played an important role in the growth of the agricultural sector in the past. This role needs to be elevated to the next level over the next decade. First, the KAU should make use of developments in the frontier sectors of biotechnology and nanotechnology to develop new seeds that are both higher yielding and with improved resistance to pests and diseases. In biotechnology, we should be able to use the emerging technologies in gene-editing and genetic engineering. In nanotechnology, we should be able to utilise new innovations in nano-agri inputs, biosensors and nano-food systems, even as

we ensure biosafety of nano-materials. These would allow Kerala's agriculture to meet the challenges in climate variability and natural disasters, as we may need more short-duration seeds resistant to salinity and flooding. The KAU should also develop better protocols for precision farming and polyhouse farming, which are expected to be more popular in the near future.

5) Similar is the case with **agricultural extension**. Kerala has a dense network of institutions for agricultural research under the central and State governments. However, our framework of extension has a number of weaknesses. Many developments in research remain in the "lab" and have not reached the "land". An example is the case of integrated multi-crop models of homestead cultivation. The *krishi bhavans* have been reduced to subsidy-disbursing institutions, and most of the working time of agricultural officers are spent on administrative activities. Kerala should modernise its *krishi bhavan* system utilising the possibilities of e-governance, allowing officers to spend more time in the farms. The activities of *krishi bhavans* should be focussed on productivity-enhancing interventions. A study group to reform *krishi bhavans* may be a useful first step.

6) Kerala needs to formulate a plan to improve the **storage and utilisation of water** in its 41 west-flowing rivers. This is extremely important to increase the irrigated area and cropping intensity. A part of the river waters could be stored in a combination of small and large reservoirs. Such a policy should be aligned with the respective river basin plans and the needs of minor irrigation schemes. Kerala also needs to undertake a programme to dredge and remove sand and other materials from the reservoir beds so as to expand their capacities of storage.

Given the necessary focus on precision farming techniques, Kerala also needs to expand the adoption of drip irrigation/fertigation, particularly in the cultivation of fruits, vegetables and coconut. The Department of Water Resources has already initiated a pilot scheme in precision farming, which should be encouraged and expanded.

7) **Agricultural marketing** is an important sphere, where the State needs urgent emphasis. Procurement is available only for paddy. In other crops, such as coconut or fruits or vegetables, the absence of adequate marketing facilities deprives the farmer of a remunerative price. Here, a structural feature of the State's agricultural sector is the key constraint. As Kerala's farmers are predominantly small and marginal, there is (a) a fragmentation of marketed surplus, leading to absence of economies of scale in sale; and (b) high levels of heterogeneity in the cropping pattern in these farms, leading to unviable quantities of marketed surplus in a number of crops. Due to these features of production, and the absence of efficient supply chains, the potential for aggregation of produce at the farmer-level remains acutely underexploited. This drawback has implications for not just the farmer's price but also the growth of enterprises in value-addition, where the availability of lumpsum quantities of raw materials is an important cost factor.

Let us first consider the question of agricultural markets.

Kerala has never passed an Agricultural Produce and Marketing Committee (APMC) Act. The extent of marketed surplus of crops like paddy or fruits or vegetables was never significant enough to require large and regulated wholesale markets like the APMC *mandis*. As such, the

recent Farm Acts of the centre can be argued to have no direct impact on Kerala. In fact, no statutory regulations or restrictions exist as to the opening of private markets. Kerala, as a result, has been classified by the central government as “not requiring reforms”. Nevertheless, no major private agricultural market has been established yet in Kerala.⁴³

The absence of an APMC Act does not imply that there are no agricultural markets with rules or regulations. There are a large number of such markets – wholesale and retail – governed by market rules notified by the State government from time to time. The Department of Agriculture owns and operates six wholesale markets. Local self-government institutions (LSGI) operate hundreds of agricultural markets. The Vegetable and Fruit Promotion Council Kerala (VFPCCK) operates 288 markets. None of these markets are covered by any State-level legislation.

The existing network of markets is inadequate for more than one reason. One, agricultural markets do not exist in many regions where farmers are forced to rely on unregulated village traders. Two, given that agricultural production can be expected to rise in the future, more markets at the local level would become necessary. Given Kerala’s historical strength in collective action, it would be appropriate if these new markets are established in the cooperative sector. Local government institutions should play a major role in investment and regulation of these markets. Kerala should also involve NABARD, the commercial banks, the Kerala Bank and PCARDBs to extend more credit to the creation/expansion of agricultural marketing infrastructure. Funds under NABARD’s RIDF can be made use of more effectively. Finally, given Kerala’s agrarian specificities, the State should begin discussions on an overall State-level regulatory regime for agricultural markets, covering public, private and cooperative markets. The existing marketing network is too fragmented, and an overarching State-level legislation will help to streamline their activities.

This brings us to the second issue i.e., aggregation of output. We have already alluded to this point in an earlier section. Creation of facilities for aggregation should be organised parallel to the creation of new markets. Here, Kerala should facilitate the establishment of a large number of FPOs, in the form of both cooperatives and FPCs at the panchayat level. Alongside, a plan to develop a modern supply chain for fruits and vegetables should be developed.

⁴³ There is no exact data on the number of private agricultural markets in Kerala. From 2004, there was a scheme of the central government called Scheme for Development and Strengthening of Agricultural Marketing Infrastructure, Grading and Standardization (AMIGS). Under AMIGS’ sub-head “Establishment of private markets/purchase centres/collection centres/market yards”, Rs 28 crore was invested in Kerala between 2005-06 and 2010-11. The nature of investments made included development of market yards, creation of agricultural marketing infrastructure, construction of modern trade centres and agri-business centres, fish processing units, milk marketing societies, collection and grading centres for rubber and grading and packing units in areca nut. Many of these were initiatives in the cooperative sector, such as the *sabakarana* (cooperative) agricultural markets.

In 2013, AMIGS was merged with the Grameen Bhandaran Yojana (Rural Godown Scheme) as a new sub-scheme called Agricultural Marketing Infrastructure (AMI), and made part of the Integrated Scheme for Agricultural Marketing (ISAM). As on 30 September 2020, there were 435 projects sanctioned under AMI in Kerala, with a total financial outlay of Rs 281.09 crore and subsidy assistance of Rs 64.26 crore. The total bank loan/own contribution was Rs 279.86 crore. Of these, 331 projects are completed and 78 projects are in the pipeline. These projects were in the spheres of market yards, agricultural processing, fishing boats, rubber processing, vehicles for transport of fish and fish products, copra processing and rubber processing.

8) **Storage and warehousing** is an important area that needs focussed attention. Kerala's agricultural production will rise in the next five years. Paddy, vegetables and fruits will be the focus areas. Development of storage and market yards (including cold storages and cold chains), scientific post-harvest management and handling systems and scientific transportation will have to receive urgent policy attention. The plan to develop a modern supply chain in agriculture should include a bottom-up development of mobile cold storages at the panchayat-level, larger storage structures at the block-level and even larger warehouses at the district-level. These structures should also be efficiently aligned and linked with the agro-parks and food parks being developed at various locations.

At present, the Kerala State Warehousing Corporation (KSWC) has 56 warehouses with a total capacity of 2.76 lakh MT (of which 0.72 lakh MT is hired capacity). Other agencies with presence in Kerala are the Central Warehousing Corporation (1.3 lakh MT) and the Food Corporation of India (5.36 lakh MT). However, these facilities largely operate in the field of paddy and not in other crops. With the National Food Security Act (NFSA) coming into operation, it is estimated that an additional 7 lakh MT of storage capacity is required in Kerala.

Under the Grameen Bhandaran Yojana, storage facilities with a total capacity of about 55,806 MT were created. Further, 211 more schemes have been sanctioned for creating 90,842 MT. According to NABARD, while the credit flow to the warehousing sector in Kerala has improved over the past five years, it has not been commensurate with the potential. The status of construction of new warehouses under the KSWC financed by NABARD's Warehouse Infrastructure Fund (WIF) is given in Appendix 1. Construction of these structures should be completed with priority.

At present, the lack of adequate land has been identified as a major constraint in the development of storage and warehousing capacities. Among farmers too, the available of farm-level storage infrastructure is poor, particularly in crops like rubber, coconut, areca nut and spices. The concept of negotiable warehouse receipts has also not caught up in the State for multiple reasons.

We believe that the following areas should also receive attention in the field of agricultural storage and warehousing.

- The State government should increase its investments in the storage and warehousing sector to expand capacities. Plan funds and the funds of KIIFB should be used for this purpose. The utilisation of central sector schemes to improve investments in the sector have to be given priority.
- Kerala should examine if a more liberal land acquisition policy for the creation of storage infrastructure can be introduced, including the use of common pool land available with panchayats. The current system of licensing should also be liberalised.
- The land and go-downs available with the primary agricultural cooperative societies should also be used to increase storage capacities in the State. In fact, investment by cooperatives can meet a good part of the required investments.

- The existing warehouses need modernisation and renovation to reduce spoilage and increase efficiency.
- Kerala Bank should be entrusted with the task of increasing credit flow into the storage and warehousing sector.

9) Promotion of **value addition and processing** should be a part of efforts to expand marketing and storage. One of Kerala's historic failures in the agricultural sector has been its inability to develop medium and large industries and enterprises that purchase farmer's products in some scale and transform them commercially into value added products. Such possibilities exist in crops like coconut, vegetables, fruits, spices and condiments and medicinal plants. Unless value addition is ensured, prices received by farmers cannot be improved.

We do not deal with this issue in detail in this chapter, as it has been dealt with in great detail in the chapter on industries.

VI The Future of the Plantation Sector

In this section, we discuss the future of Kerala's plantation sector. The discussion is structured separately from other crops, as the plantation sector cannot be called a purely agricultural sector and shares many characteristics of production organisation with the industrial sector. Also, these commodities are managed under the different commodity boards of the Ministry of Commerce, Government of India. They are considerably export-oriented and their prices are largely determined outside the borders of the State and the country. Some discussion on spices are also included here, even though they are not plantation crops.

The culture of plantations is an integral part of the culture and geography of Kerala. The ecologically unique, though fragile, highlands of Kerala form a distinct component of the State's agrarian history and the contemporary canvas. Kerala contributes about 45 per cent to the total plantation production in India, and accounts for about 37 per cent of the total area cultivated with plantations in India. In **rubber**, Kerala accounts for about 77 per cent of the national production. In **cardamom**, the State accounts for about 89 per cent of the national production. In **coffee** and **tea**, these shares are 22 per cent and 5 per cent respectively. Taking these four crops together, cultivation takes place in 7.1 lakh hectares of land, constituting 27 per cent of Kerala's cropped area. Further, it is estimated that about 20 per cent of Kerala's population depends on plantations for their livelihood. In absolute terms, more than 3 lakh workers depend on plantations for their employment.

Like in other parts of India, Kerala's plantations have a history that can be traced back to the colonial period. If Kerala was India's foremost globalised State in the 20th century, it was largely due to the dominant presence of spices and plantations in its cropping pattern and the export revenues they brought in. After independence, plantations were exempted from the land reform legislations in Kerala owing to their industrial structure of production and the presence of a large number of daily wage workers. This policy allowed plantations to retain their economies of scale.

Long leases of land were allowed to remain valid even after independence, which allowed for a stable tenurial framework.

In 1950, the Plantation Labour Act formalised labour relations in plantations and reaffirmed its status as an industrial enterprise. The Act provided a number of social security covers for plantation workers.

Beginning from the 1940s, plantation crops were brought under the special control of commodity boards, and thus separated from the Ministry of Agriculture. The Coffee Board was formed in 1942, the Rubber Board was formed in 1947, the Tea Board was formed in 1954 and the Spices Board was formed in 1987. These Boards were entrusted with the tasks of promotion of area and production, and received special funds from the central government. Funds were also set aside for export promotion schemes, and protection was offered from cheaper imports. In short, the plantation sector in Kerala grew between the 1940s and the 1980s in the shadow of a protectionist economic policy framework.

The situation changed by the 1990s. The World Trade Organisation (WTO) agreement came into operation from 1995. The WTO agreement led to the removal of quotas and tariffs that were the hallmark of India's protectionist trade policy. This was the first stage of the contemporary crisis in Kerala's plantation economy. Prices of plantation crops began to crash and many districts of Kerala experienced an acute agrarian crisis between 1997 and 2004.

In 2010, India signed the Association of Southeast Asian Nations (ASEAN) agreement, which inaugurated a new stage in the crisis. Many ASEAN countries shared India's tropical climate and were competitors in the production of spices and plantation crops. The State government did not have any freedom to influence the national trade policy; these agreements were also signed by the executive without consulting either the States or the legislature. Later, the ASEAN agreement was sought to be carried forward with the zero-duty Regional Comprehensive Economic Partnership (RCEP) agreement, but progressive political movements in India were able to contain that move, *albeit* temporarily. These talks may restart anytime, and the danger continues to loom large.

Free trade agreements were only a part of the reason for the contemporary crisis in Kerala plantations. Inability to innovate and integrate, continuing poor productivity and climate variabilities have all made a bad situation worse. The productivity gap is particularly striking: in tea, Kerala's productivity is 1619 kg/ha, while national productivity is 2183 kg/ha. In *robusta* coffee, it is 842 kg/ha in Kerala and 1047 kg/ha in India. In rubber, Kerala's productivity is 1400 kg/ha whereas it is 1500 kg/ha in India. Also, productivity levels in Kerala appear to have fallen over the recent years.

One important reason for the crisis of production of plantation crops in Kerala is the drastic reduction of central government finding for the four commodity boards for tea, coffee, rubber and spices. In Table 7, we provide data on the real expenditures (revenue and capital) under the four boards. The figures are striking. Between 2011-12 and 2018-19, the expenditures fell

drastically by 54.8 per cent in the Tea Board, 33.9 per cent in the Coffee Board, 34.3 per cent in the Rubber Board and 40 per cent in the Spices Board.

Table 7 *Expenditures for the four commodity boards under the Ministry of Commerce, India, revenue plus capital, deflated by GVS A deflator with base year 2011-12 = 100, 2011-12 to 2019-20, in Rs crore*

Year	Real expenditures (in Rs crore)			
	Tea Board	Coffee Board	Rubber Board	Spices Board
2011-12	265.0	202.4	195.8	109.4
2012-13	183.6	141.0	171.8	101.2
2013-14	150.3	132.8	170.2	90.9
2014-15	149.1	135.5	176.0	92.9
2015-16	149.8	118.7	168.3	87.9
2016-17	122.0	114.1	120.7	65.2
2017-18	147.1	138.0	144.0	75.5
2018-19	119.7	133.7	128.6	65.7
2019-20	143.3	179.8	175.5	81.9
% fall, 2011-12 to 2018-19	-54.8	-33.9	-34.3	-40.0
% fall, 2011-12 to 2019-20	-45.9	-11.2	-10.4	-25.1

Source: Expenditure budgets, Ministry of Finance, Government of India, various years.

Such a decline in expenditure seriously affected the operations of the boards in production and marketing, and had a direct and visible impact on the growth performance of the plantation sector. The contribution of the plantation sector to Kerala's GSDP fell from Rs 21,000 crore in 2011-12 to Rs 9950 crore in 2018-19. More than 13 plantations in the State are closed. About 6000 persons lost jobs directly and indirectly. No new investments are forthcoming in the plantation sector. No plantation invests in replanting, as government subsidies have been slashed with the fall in outlays. Some estimates show that even the area used for cultivation within the plantations has declined over the last decade.

We recommend that the State government should initiate a set of discussions with the Ministry of Commerce to ensure that the budgets outlays for commodity boards are urgently raised. This needs to be a demand of a mass movement in Kerala, joined by the government, all political parties, growers and workers.

Discussions with managements of plantations in Kerala usually bring out a set of demands: (a) labour and labour welfare costs in Kerala are higher than in other States, accounting for about 65 per cent of the cost of production; (b) plantations should be allowed inter-cropping and diversification into new high-value crops; (c) plantations should be allowed to begin ecotourism activities; and (d) Kerala should have a policy of "once a plantation, always a plantation".

It was in the context of these demands that the Justice Krishnan Nair Commission was appointed in 2015, which submitted its report to the government in August 2016. This report recommended 14 specific policy changes in the plantation sector. The present State government appointed a committee of secretaries to implement the major recommendations of this report. In

June 2018, a major set of decisions were taken by the Council of Ministers, Government of Kerala.

- 1) The State decided to completely abolish plantation taxes.
- 2) The collection of agricultural income tax from plantations was to be frozen.
- 3) Charges of seigniorage in the cutting of rubber trees were abolished.
- 4) All *layams* (labour lines) in the plantations were to be exempted from the building taxes charged by the local bodies.
- 5) The reconstruction of *layams* would be included as part of the LIFE Mission of the Kerala government and 50 per cent of the reconstruction costs would be met by the State government. The estate owners may pay the rest 50 per cent over seven annual instalments. In a survey, it was found that 32,454 plantation workers are homeless. In addition, about 5348 retired plantation workers were homeless. They will be included under the ambit of LIFE mission.
- 6) The procedure of renewing leases of plantations would be eased.
- 7) Plantation lands will be exempted from the Kerala Forest (Vesting and Management of Ecologically Fragile Land) Act (EFL).
- 8) A plantation policy would be formulated for the State.

These eight decisions were long-standing demands of the plantation owners in Kerala. In February 2020, the government also released a draft of a plantation policy. Here too, many demands of the plantation sector found a place. Below, we summarise the major points in the draft plantation policy.

- 1) Plantations would be retained and protected as plantations. The policy of renewing leases of plantations would be further eased and hastened. This would ensure that the existing barriers to services like bank credit would be removed.
- 2) The measurement and demarcation of EFL would be hastened, so that more land can be brought under cultivation at the earliest.
- 3) The government would favourably visit the theme of maximising income from one unit of plantation land. This would be attempted without disturbing the basic features of production in a plantation. The government will explore the possibilities for allowing more inter-cropping, particularly vegetables, in the plantations. The government will also explore if the Land Utilisation Order of 1967 needs amendment in this regard.
- 4) A major initiative for improving the processing and value-addition of plantation crops will be introduced. The cluster schemes of the Industries department will be extended to plantation crops also.
- 5) Plantations currently closed will be reopened with the help cooperatives or other means. This will help protect the employment of plantation workers.
- 6) Schemes of local bodies will include schemes for plantation workers and plantations also.
- 7) A special scheme for improving the skills of plantation workers will be introduced.
- 8) The Plantation Relief Fund and its activities will be streamlined and improved.
- 9) Given the impacts of climate variations, plantation regions will also require better watershed-based planning, construction of small water storage structures, renovation of wells and ponds and drinking water schemes. Using funds from the Disaster

Management Authority, such works will be undertaken in consultation with the plantation managements and local bodies.

- 10) Production of renewable energy – solar, wind and biogas - will be promoted in the plantation sectors.
- 11) Possibilities of tourism in the plantations may be visited, but it will be implemented with the condition that the basic structure of plantations will remain unchanged.
- 12) A Plantation Directorate will be formed by the government, which will allow the convergence of activities of the departments of revenue, forest, labour, industry, local bodies, finance, power and agriculture. This Directorate will be a one-stop contact point for all activities related to plantations and the State government.
- 13) All incentives and exemptions available to new industrial units will also be available for plantation-related initiatives.

In Table 8, we provide a summary of the status with regard to the major recommendations contained in the Krishnan Nair Committee and the draft plantation policy. It lists out the tasks completed, tasks partly fulfilled and tasks left unfulfilled. We hope that the government and the plantation managements will continue discussions and reach an early resolution on the outstanding issues.

We shall, however, state two points of concern. These represent expectations from the plantation sector.

- 1) Kerala needs to raise investments in plantations to expand replanting and improve productivity. This is an urgent need for the long-term survival of Kerala's plantations. Kerala also needs more investments in the value-addition sector of plantations. We expect the plantation managements to publish an investment plan in these two spheres. In fact, we would argue that a part of the State government's promised support to plantations may be made conditional on the achievement of specific outcomes in replanting and value addition.
- 2) Kerala is a labour-friendly State. As such, demands to weaken welfare measures where the plantation industry may have social obligations will not be received favourably by the government. Kerala's higher wage rates are a given, and we need forward-looking policies where employers and workers join hands for the overall progress of the sector. It should also be clear that the basic structure and character of the plantations in the State is non-negotiable, given the specific place of the sector in the State's agrarian and labour landscape.

Table 8 *Status of the recommendations of the Justice Krishnan Nair Commission on plantations (2016), Kerala*

Recommendation	Current Status	Remarks
Abolition of plantation tax	Pending. The Kerala Plantation Tax (Abolition) Bill 2019 was published in the Assembly on 19 March 2019	The decision to abolish plantation tax was announced by the Chief Minister on 18 October 2018. But not implemented yet.
Abolition of agricultural	Pending. The Kerala	The decision to abolish agricultural

income tax	Agricultural Income Tax (Abolition Bill) 2019 was published in the Assembly on 4 January 2020	income tax was announced by the Chief Minister on 18 October 2018. But not implemented yet.
Building tax exemption for labour lines	Implemented	GO(P)No.42/2019/LSGD dated 14-06-2019.
Abolition of seigniorage on rubber trees	Orders issued	Not implemented yet due to writ petitions pending before the High Court.
Construction of worker's quarters	Pending, as industry claims there is absence of proper guidelines and clarity	Discussions needed
Implementation of ESI scheme	Pending	Government has not notified the industry under the ESI
Allowing multi-cropping and inter-cropping in plantations	Pending	Discussions needed
Exempting plantations from the provisions of EFL Act	Pending	Industry believes that though plantations are exempted in the original Act, those plantations taken over prior to the Act have to be returned. Unlikely to be resolved.
Procurement of Kerala-origin tea, coffee and cardamom through the Kerala State Civil Supplies Corporation	Pending	Procurement of the three goods continues to happen from outside the State. Discussions needed.
Reopening of closed down estates	Pending	No estates have been reopened. Discussions needed.
Renewal of lease period of leased estates	Pending	Discussions needed
Time-bound wage revision of workers	Implemented	With effect from 1 January 2019
Release of a plantation policy	Draft published	The draft policy needs to be finalised
Establishment of a Plantation Directorate	Pending	Government should establish the Directorate under the Department of Industries.

Source: Discussions with officials of the government and Association of Planters of Kerala (APK)

Appendix 1 *Progress of construction of new warehouses under the Kerala State Warehousing Corporation (KSWC), as on 13-10-2020*

Name of Project	Sanctioned amount (crore)	Expenditure incurred (crore)	Progress of Work
Construction of warehouse at State Warehouse, North Paravur, Ernakulam district; funded by NABARD	1.0	0.67	Work completed and warehouse is ready for inauguration
Construction of warehouse at the State Warehouse, Muthalamada, Palakkad district	7.5	0.027	Soil testing conducted; total station survey conducted; MoU signed between KSWC and Kerala State Nirmithi Kendra for consultancy; structural design to be obtained and to be finalized; e-tender to be invited on getting technical sanction.
Construction of warehouse at the State Warehouse, Muthalamada, Palakkad district	7.5	0.027	Soil testing conducted; total station survey conducted; MoU signed between KSWC and Kerala State Nirmithi Kendra for consultancy; structural design to be obtained and to be finalized; e-tender to be invited on getting technical sanction.
Construction of warehouse at State Warehouse, Punalur, Kollam district	3.25	0.048	Soil test conducted; total survey station conducted; building permit obtained; MoU signed between KSWC and Kerala State Nirmithi Kendra for consultancy; exchange of 3.11 cents of land with the adjacent plot to avoid demolishing of existing godown yet to be obtained from the government.
Construction of new warehouse at the State Warehouse, Mavelikkara, Alappuzha district	1.8	0.007	Building permit obtained; MoU signed between KSWC and Kerala State Nirmithi Kendra for consultancy; work is in progress
Construction of new warehouse at State Warehouse, Haripad, Alappuzha district	3.63	0.025	Soil test conducted; total station survey conducted; Fire NOC obtained; MoU signed between KSWC and Kerala State Nirmithi Kendra for consultancy; work is in progress; work tendered.
Construction of new warehouse at Sasthamkotta, Kollam district	2.4	0.006	Soil test conducted; total station survey conducted; Fire NOC obtained; MoU signed between

			KSWC and Kerala State Nirmithi Kendra for consultancy; work is in progress; work in progress.
Construction of new warehouse at State Warehouse, Thalassery, Kannur district	1.67	0.014	Soil test conducted; total station survey conducted; Fire NOC obtained; MoU signed between KSWC and Kerala State Nirmithi Kendra for consultancy; sanction also obtained from Coastal Regulation Authority; work e- tendered; in work progress.
Construction of warehouse-cum-agri complex at State Warehouse, Kozhinjampara, Palakkad district	3.8 (from NABARD) 0.3 (from plan funds)	0.024	Soil test conducted; total station survey conducted; Fire NOC obtained; MoU signed between KSWC and Kerala State Nirmithi Kendra for consultancy; sanction also obtained from Coastal Regulation Authority; work will begin soon.

Source: Kerala State Warehousing Corporation.

*Animal Husbandry in Kerala:
An Assessment of Progress and a Roadmap for the Future*

I Introduction

The animal husbandry sector in Kerala contributed about 27 per cent to the Gross State Value Added (GSVA) from agriculture and allied sectors in 2018-19. It is estimated that about 8.8 million households are involved in animal husbandry in Kerala. A large number of women are also involved in the work force in this sector. At the same time, livestock rearing is not a vocation practised by a large proportion of agricultural households in the State. In 2012-13, only 51.6 per cent of all agricultural households were engaged in animal farming, while the corresponding national average was 71.9 per cent. The corresponding State-level figures were 95 per cent for Punjab, 93.3 per cent for Haryana, 80.8 per cent for Gujarat and 61.2 per cent for Tamil Nadu. As a result, if the average monthly income of an agricultural household was Rs 11,888 in Kerala, only Rs 575 (4.8 per cent) came from animal farming. In other words, animal farming is presently, at best, a supplementary source of income for Kerala's rural households.

II Performance of the Animal Husbandry Sector

Livestock population

Data on the population of livestock and poultry are available from the Indian Livestock Census, organised at periodic intervals. The data released for 2019 are broadly encouraging for Kerala (Table 1). The total livestock population in Kerala, after falling between 2007 and 2012, rose from 27.3 lakhs to 29 lakhs between 2012 and 2019. Within livestock, while cattle population rose moderately, the population of goats and pigs rose substantially. Within poultry, population grew consistently between 2007 and 2019. Between 2012 and 2019, the poultry population in Kerala increased by about 57 lakhs.

Table 1 *Population of livestock and poultry, Kerala, 2007 to 2019, in lakhs*

Item	2007	2012	2019
Total livestock population	35.8	27.3	29.0
<i>Cattle population</i>	<i>17.4</i>	<i>13.3</i>	<i>13.4</i>
<i>Buffalo population</i>	<i>0.6</i>	<i>1.0</i>	<i>1.0</i>
<i>Goat population</i>	<i>17.3</i>	<i>12.5</i>	<i>13.6</i>
<i>Pig population</i>	<i>0.6</i>	<i>0.6</i>	<i>1.0</i>
Poultry population	156.8	242.8	299.7

Source: Indian Livestock Census, various years.

Between 2007 and 2012, cattle population in Kerala had sharply fallen by about 4 lakh animals. One reason for this fall in cattle population was the high rate of slaughtering in the State, given the high domestic demand for meat. It was in this context that the government introduced the herd induction scheme to reverse the fall in cattle population. Between 2006-07 and 2019-20, a total of more than 80,000 milch animals and about 18,000 heifers were distributed to growers (see Table 2). The rise, though moderate, of cattle population between 2012 and 2019 is a sign of the success of the herd induction programme.

Table 2 *Number of cattle inducted as part of herd induction utilisation plan fund, Kerala, 2006-07 to 2019-20, in numbers*

Year	Number of animals inducted	
	Milch animals	Heifers
2006-07	5884	-
2007-08	10,440	-
2008-09	7000	480
2009-10	4079	750
2010-11	4270	1260
2011-12	2550	980
2012-13	3507	1000
2013-14	4717	1175
2014-15	6339	1770
2015-16	7215	2145
2016-17	6540	2320
2017-18	7063	3055
2018-19	5606	1780
2019-20	5590	1267
Cumulative total	80,800	17,982

Source: Department of Dairy, Government of Kerala.

Trends in GSVA and VOO

If we consider data on the GSVA in the livestock sector, the overall growth pattern in the last decade shows that there was period of growth between 2011-12 and 2014-15, and then a decline (Figure 1). In real terms, there was an absolute decline in the GSVA by Rs 20,388 crore between 2014-15 and 2018-19. There was a moderate pickup of growth in the first year of the 13th plan, but the heavy floods of 2018 and 2019 resulted in a sharp fall of GSVA in 2018-19 and 2019-20 also.

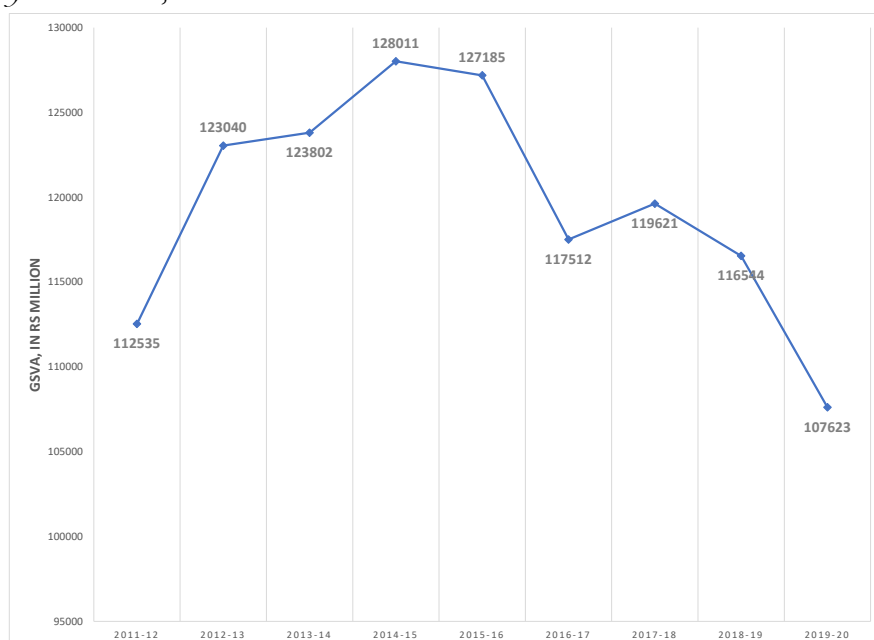
If we consider the data on value of output (VOO) released by the CSO, the findings on GSVA are corroborated (Figure 2).⁴⁴ There was a period of growth till 2015-16, followed by a sharp fall in 2016-17 (the last year of the 12th plan). There was a pickup in 2017-18, but lack of VOO data for more recent years constrains us from a further analysis of the 13th plan period.

⁴⁴ Gross Value Added is defined as the value of output minus the value of intermediate consumption and is a measure of the contribution to GDP made by an individual producer, industry or sector.

Thus, overall, while the livestock sector grew point-to-point between 2011-12 and 2018-19, the slowdown after 2014-15 is a matter of concern and needs urgent attention. We shall now consider trends in VOO for each sub-sector (Figure 2).

Over the 12th plan period, there was a sharp fall in the VOO for milk and milk products. One reason for this fall was the incidence of the foot-and-mouth disease among cattle in Kerala in 2013-14, whose impacts continued through the 12th plan period. About one lakh animals were affected and more than 6000 animals died. Within bovines, more than 33,000 animals were affected and about 2800 animals died. Further, in 2016-17, there was a severe drought that adversely affected the production of milk. The procurement of milk recorded a fall by about 1 lakh tons in 2016-17. In January 2016, MILMA imported about 1.6 lakh tons of milk per day from outside the State. Post-drought, in January 2017, MILMA was importing about 4 lakh tons of milk per day.

Figure 1 *Gross State Value Added (GSVA) at constant basic prices, livestock sector, Kerala, 2011-12 to 2019-20, base year 2011-12, in Rs million*



Source: CSO.

In the single year of the 13th plan, there was a rise in VOO in milk but it needs to be seen if the revival is maintained. The record in the 13th plan would surely be marred by the severe floods in the State in 2018 and 2019. The 2018 floods resulted in loss of income through animal products and damage to infrastructure and livestock assets. More than 5,000 cows, 11 lakh chickens, and 4.8 lakh ducks died totalling about 16.5 lakh livestock deaths. The total damage and loss for the livestock sector was calculated at Rs 687.5 crore. Estimated income loss to the livestock subsector was Rs 519.73 crore, including production losses and decline in egg and milk production.

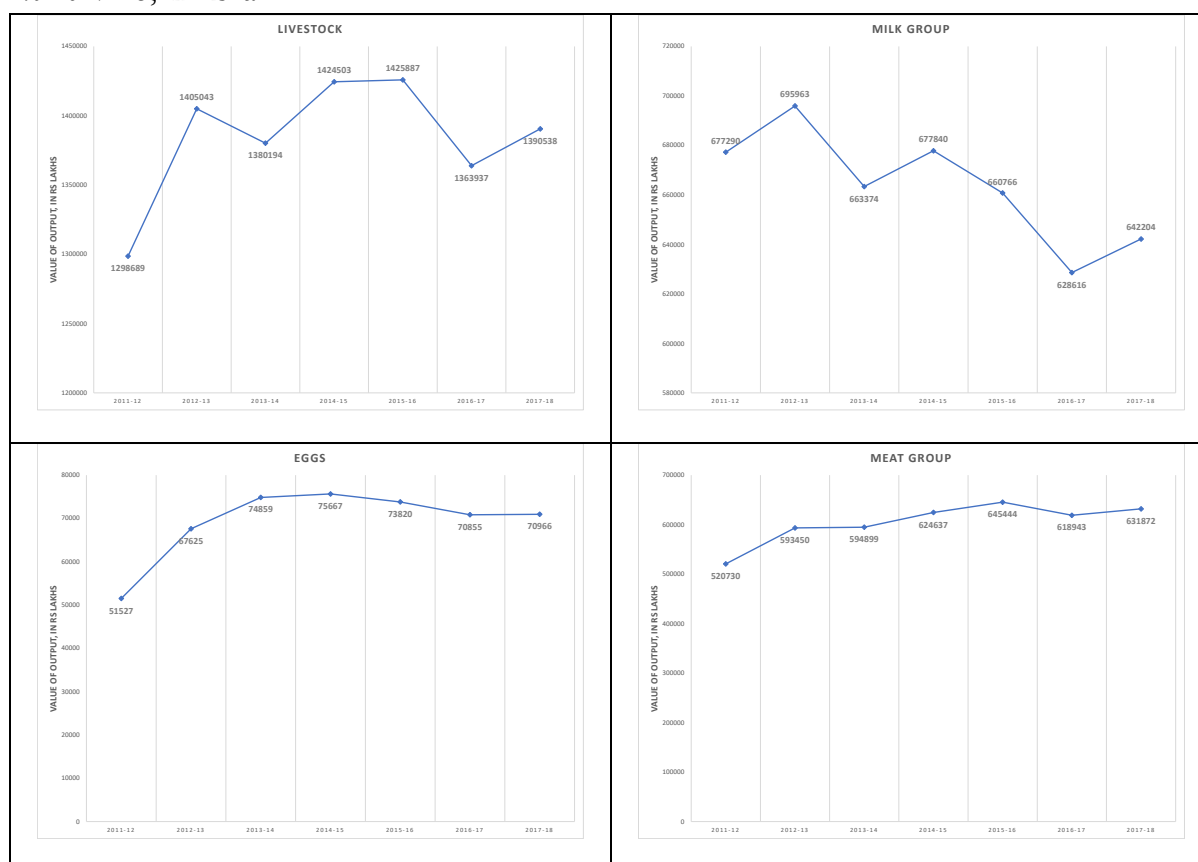
After 2011-12, there was also a sharp fall in the VOO in dung. At the same time, there was a growth in the VOO in egg and meat between 2011-12 and 2017-18. There was a sharp growth in

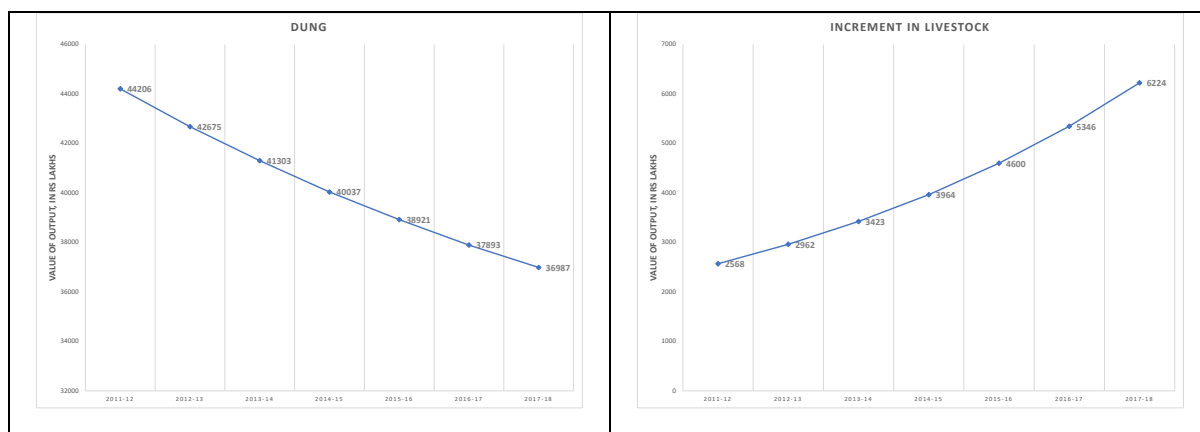
VOO from “increment in livestock”; the estimates of increment in livestock population are estimated by extrapolating the population figures available from the successive rounds of Indian Livestock Census. In other words, this is simply a reflection of a rise in livestock and poultry population over the years. Thus, the VOO data also raise a number of issues of concern in Kerala’s animal husbandry sector that requires urgent policy attention.

Production Estimates

Let us now come to direct estimates of production in the animal husbandry sector. To begin with, data on milk production in Kerala between 1992-93 and 2018-19 are given in Figure 3. Milk production grew from 18.9 lakh tons in 1992-93 to 27.2 lakh tons in 2001-02, which was a commendable stretch of growth. There was a sharp fall by about 7 lakh tons in milk production between 2001-02 to 2004-05. Thereafter, there was another period of growth between 2005-06 and 2012-13, when milk production rose again to 27.9 lakh tons. Between 2012-13 and 2016-17 (the 12th plan period), milk production fell again by about 2.7 lakh tons. In the 13th plan period, the decline in milk production was arrested and there was a moderate rise in milk production. The milk production in 2019-20 stood at 25.4 lakh tons, which was slightly higher than the production figure of 25.2 lakh tons for 2015-16. Clearly, if there no floods in 2018 and 2019, there would have been a visible revival of production. Data on per capita milk production in Figure 3 also reaffirm these findings.

Figure 2 *Value of output (VOO) from livestock and selected sub-sectors, Kerala, in 2011-12 prices, 2011-12 to 2017-18, in Rs lakh*





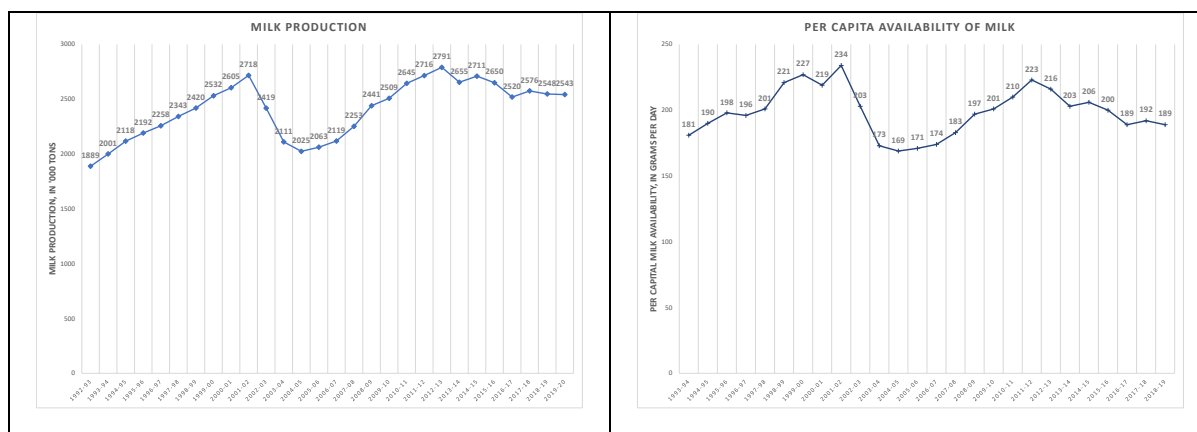
Source: CSO.

Data with the Dairy department show that Kerala's dependence on imported milk is declining. In 2016-17, about 9 lakh litres of milk were imported into the State every day. By 2019-20, Kerala was able to reduce the dependence on milk imports to about 3.2 lakh litres per day.⁴⁵ Other indirect indicators of milk production also show promising outcomes for the 13th plan period. For instance, in 2015-16, MILMA used to import at least 6 to 7 lakh litres of milk per day from outside Kerala. In 2020, MILMA was importing only about 88,000 litres of milk per day. Further, MILMA exports about 58,000 litres per day to powder factories outside the State. If we deduct exports from the imports, MILMA's deficit declines to just 30,000 litres per day. The fall in MILMA's reliance on imported milk indicates a possible rise in domestic milk production not captured adequately in official data. More clarity will be obtained when milk production data for 2020-21 become available.

The moderate revival of milk production during the 13th plan period was a reflection of improved levels of intervention by the government in milk procurement (see Table 3). In 2016-17, the procurement of milk through dairy cooperatives was 5.9 lakh tons. From 2017-18, this could be raised up to 6.8 lakh tons by 2019-20. On a per day basis, this represented a rise of procurement from 16.3 lakh litres per day to 18.6 lakh litres per day.

Figure 3 *Milk production and per capita availability, Kerala, 1992-93 to 2019-20, in '000 tons and grams per day*

⁴⁵ The total deficit in milk production, when estimated on the basis of a requirement of 250 gm per person for 365 days for the projected population, is placed at a slightly higher level of 4.6 lakh tons.



Source: Department of Dairy, Government of Kerala.

Table 3 *Procurement milk through dairy cooperatives, Kerala, 2007-08 to 2019-20*, in lakh MT per annum and lakh litres per day

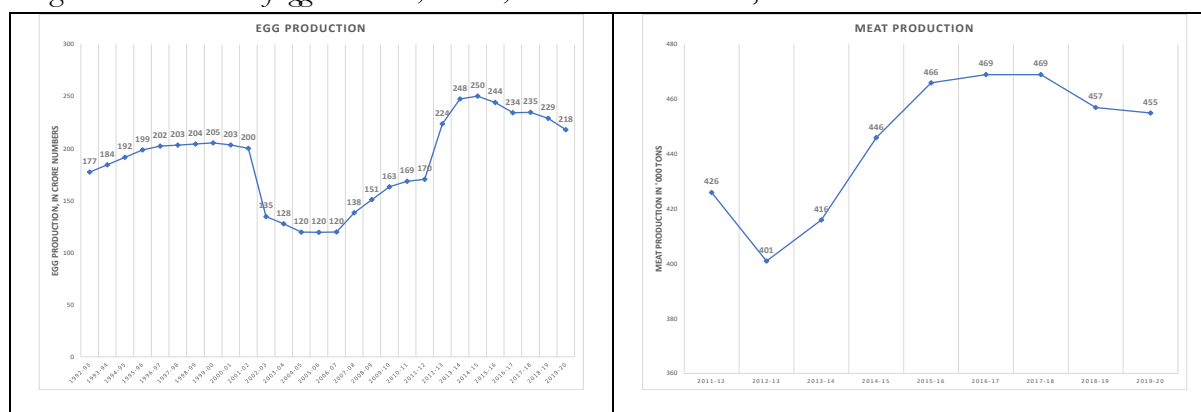
Year	Procurement of milk through dairy cooperatives	
	In lakh MT per annum	In lakh litres per day
2007-08	4.1	11.2
2008-09	4.0	11.1
2009-10	4.3	11.7
2010-11	4.1	11.2
2011-12	4.5	12.4
2012-13	4.9	13.4
2013-14	5.3	14.4
2014-15	5.6	15.3
2015-16	6.0	16.4
2016-17	5.9	16.3
2017-18	6.6	18.1
2018-19	6.8	18.6
2019-20	6.8	18.6

Source: Department of Dairy, Government of Kerala.

In the case of egg production, there was a clear phase of rise in production between 1992-93 and 2001-02 by about 23 crore eggs (Figure 4). However, there was a sharp fall in egg production between 2001-02 and 2006-07 by about 80 crore eggs. Thereafter, egg production rose sharply between 2006-07 and 2014-15 by about 130 crore eggs, which was a commendable growth performance. However, egg production fell again after 2014-15, and there was a decline in production by about 32 crore eggs between 2014-15 and 2019-20. The total import of eggs into Kerala in 2019-20 was 254.8 crore eggs, while the domestic production stood at 218.1 crore eggs.

In the case of meat production, there was a moderate rise in meat production by about 55,000 tons between 2011-12 and 2019-20 (see Figure 4). The decline in 2018-19 and 2019-20 appears to be a result of the floods of 2018 and 2019. In 2019-20, the total production stood at 4.55 lakh tons, while the total import of processed meat (i.e., excluding live animals transported for slaughter) was at 28,000 tons.

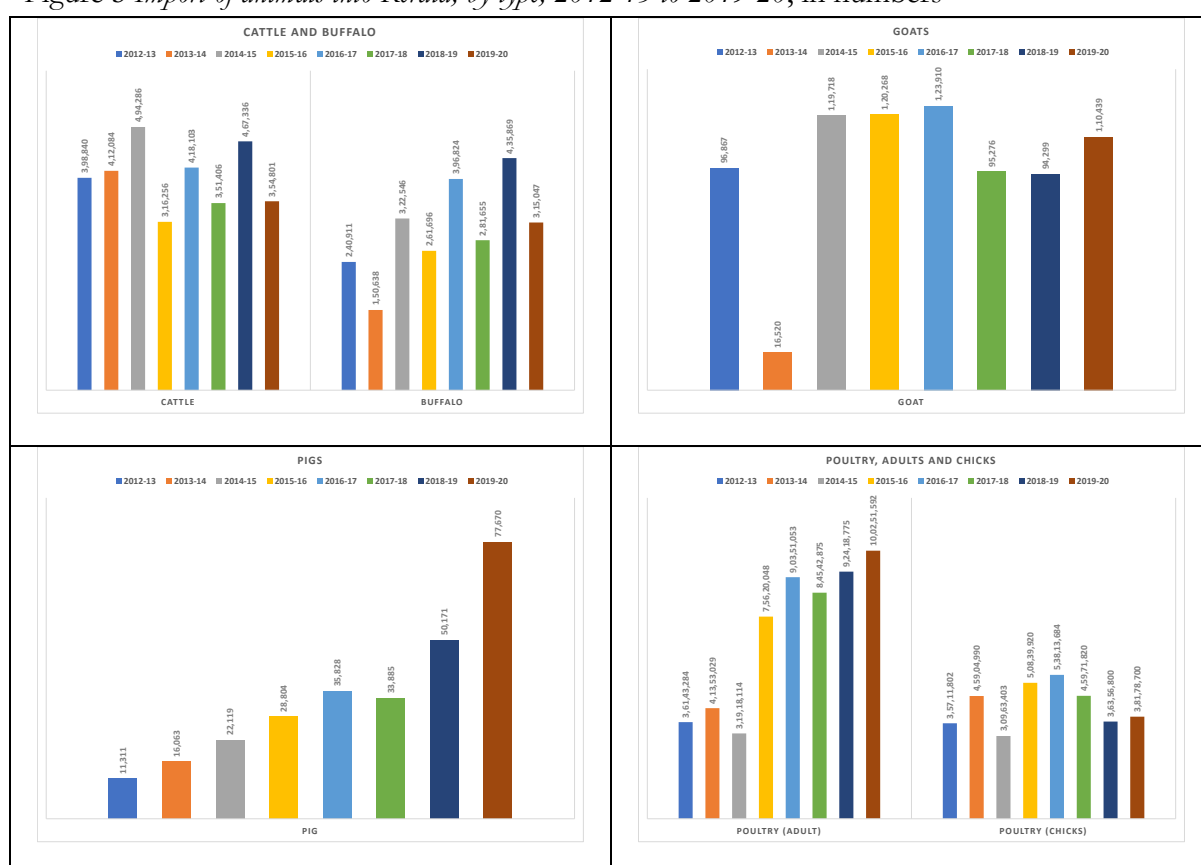
Figure 4 *Production of egg and meat, Kerala, 1992-93 to 2019-20, in '000 numbers and '000 tons*



Source: Department of Animal Husbandry, Government of Kerala.

Domestic demand for meat has been growing at a faster rate. An indication of this is available from the data on import of different types of livestock and poultry animals into Kerala from 2012-13 (see panel in Figure 5). While there was a moderate decline in the import of cattle after 2014-15, the import of buffaloes rose over the same period. While the import of goats was largely unchanged, the import of pigs sharply rose from 11,311 in 2012-13 to 77,670 in 2019-20. So did the import of adult poultry birds into the State, which rose from about 3.6 crores in 2012-13 to about 10 crores by 2019-20. The question to ask is if Kerala can increase its dependence on domestically grown animals for slaughter.

Figure 5 *Import of animals into Kerala, by type, 2012-13 to 2019-20, in numbers*



Source: Department of Animal Husbandry, Government of Kerala.

Major gains in the 13th plan period

The total allocation for the animal husbandry and dairy departments has risen consistently over the past decade (Table 4). The total plan allocation rose from Rs 175 crore in 2011-12 to Rs 436 crore in 2019-20, which was a 149 per cent rise. However, expenditures have lagged behind allocations and the total spending in 2019-20 was only Rs 232 crore out of the allocation of Rs 436 crore. Two notable deductions from Table 4 are that the utilisation of funds from the central sector schemes and NABARD's RIDF have declined for the animal husbandry and dairy departments after 2016-17.

In addition to plan funds listed in Table 4, the departments also make use of the funds allocated through the plan to the local self-governments (LSGs). Table 5 provides the data on expenditures through LSGs. The total expenditure in the sector through LSGs rose from Rs 44 crore in 2012-13 to Rs 182 crore in 2019-20. The share of animal husbandry sector in the total production expenditures of LSGs also rose from 28.3 per cent in 2012-13 to 40 per cent in 2019-20. As a share of the total expenditure of LSGs, expenditure on animal husbandry also rose from 3.5 per cent in 2012-13 to 7.4 per cent in 2019-20.

There were important institutional interventions made in the animal husbandry sector during the 13th plan period. We shall list a few important points below.

- 1) Higher procurement of milk through the dairy cooperatives and the continuation of the herd induction programme have already been alluded to. The member ship in dairy cooperatives has risen by 25,000 during the 13th plan period.
- 2) The opening of 24*7 veterinary hospitals was an important initiative during the 13th plan period. Currently, there are 31 such hospitals across the State that cover 45 blocks. In 2020-21, the presence of 24*7 hospitals is planned to be expanded from 45 blocks to all the 152 blocks of the State.
- 3) An insurance scheme for cattle has been introduced by the Animal Husbandry and Dairy departments. Their schemes together currently cover more than 85,000 animals.
- 4) Four regional laboratories under the Animal Husbandry have received accreditation status over the 13th plan period.
- 5) Two tele-veterinary units have been established.
- 6) About 500 artificial insemination centres for goat have been opened, which was instrumental in the rise in goat population seen during the livestock census of 2019.

Table 4 *Plan allocations and expenditures, Department of Animal Husbandry and Dairy, Kerala, 2011-12 to 2020-21, in Rs crore*

Year	Free plan + SS	CSS	RIDF	Total
Allocation				
2011-12	156	7	12	175
2012-13	223	18	23	264
2013-14	285	17	23	325
2014-15	332	17	33	382

2015-16	335	27	43	405
2016-17	333	22	50	404
2017-18	356	19	50	425
2018-19	388	16	50	453
2019-20	394	12	30	436
2020-21*	345	12	22	379
Expenditure				
2011-12	200	15	0	215
2012-13	219	23	0	242
2013-14	263	11	12	286
2014-15	277	41	17	335
2015-16	274	6	21	301
2016-17	309	13	0	323
2017-18	365	9	0	374
2018-19	327	2	0	329
2019-20	228	4	0	232
2020-21*	150	2	1	153

Source: Kerala State Planning Board.

Note: Plan includes plan schemes, central schemes and state share for central schemes; *: As on 21.10.2020.

Table 5 *Expenditure in animal husbandry and dairy by local government institutions, Kerala, nominal figures, 2012-13 to 2019-20, in Rs crore*

Year	Expenditure on AH & Dairy (AH)	Production expenditure (P)	Total expenditure (T)	AH/P (%)	AH/T (%)
2012-13	44	154	1250	28.3	3.5
2013-14	69	226	1942	30.3	3.5
2014-15	71	240	2153	29.6	3.3
2015-16	72	242	2401	29.6	3.0
2016-17	137	373	2041	36.6	6.7
2017-18	232	660	2750	35.1	8.4
2018-19	234	674	3330	34.7	7.0
2019-20	182	455	2445	40.0	7.4

Source: Kerala State Planning Board

III Strategies for Growth

It is important to understand some of the basic features of the animal husbandry sector in Kerala before we formulate strategies for the future.

First, Kerala's dairy sector may be characterised as a low input-low output system. Most of the farming of animals in Kerala takes place in small homesteads integrated with crop cultivation and fisheries. The average herd size in small homesteads does not normally exceed 3, while in

medium sized homesteads the herd size goes up to 9. More than 55 per cent of cattle farmers maintain herd sizes of 2 or 3, while 32 per cent maintain single-cow units.

The number of commercially operating dairy farms with larger herd sizes are less in Kerala. Data from the Dairy Department show that there were only 41 commercial farms (0.2 per cent) that had herd size more than 100 (Table 6). About 92 per cent of the farms had herd size less than 20, out of which about 70 per cent had herd size 5-10. In other words, Kerala has enormous potential in expanding the average herd size and benefit from economies of scale in production and marketing.

Table 6 *Classification of dairy farms by herd size, Kerala, 2019-20, in number and per cent*

Size of herd in dairy farms	Number of dairy farms	Share in total (%)
5 to 10	9878	69.5
11 to 20	3166	22.3
21 to 50	984	6.9
51 to 100	152	1.1
More than 100	41	0.2
Total	14221	100.0

Source: Department of Dairy, Government of Kerala.

Secondly, even though herd sizes are low, productivity of cattle in Kerala is higher than the national average. The average milk yield per animal in India for exotic/crossbred animals is 7.9 kg and for indigenous/non-descript animals is 3.0 kg per day. The corresponding figures for Kerala are 10.2 kg per day and 3 kg per day respectively. The productivity of 10.2 kg per day in Kerala for exotic/crossbred animals was the second highest among Indian States after Punjab (13.4 kg per day). This advantage for Kerala was due to the high percentage of exotic/crossbred animals in the population compared to other States. Data from the Livestock Census of 2019 show that about 94 per cent of cattle in Kerala are either exotic or crossbred and only 6 per cent are indigenous/non-descript breeds. In India, on the other hand, only 26 per cent of the cattle are exotic or crossbred and the remaining 74 per cent are indigenous/non-descript breeds.

The question in Kerala is how it could build on the progress in artificial insemination and genetic improvement made over the years into concrete gains in milk production. In our view, the high genetic quality of Kerala's cattle population is a most appropriate launchpad for a rapid rise in milk production in the recent future. At the same time, Kerala should also aim at improving the genetic basis of its livestock and raise productivity to at least 13 to 14 litres per day.

Thirdly, demand for milk is expected to rise over the next decade. A study by the NCAER in 2014 argued that the total demand for milk was 27.9 lakh tons in 2009-10, which would rise to 32.9 lakh tons in 2020, 34.2 lakh tons in 2025 and 35.2 lakh tons in 2030. Based on an

interventionist scenario, the supply of milk was projected to be 31.5 lakh tons in 2020, 35.1 lakh tons in 2025 and 39.2 lakh tons in 2030. Clearly, the supply projections went awry as the production of milk declined after 2012. Thus, Kerala is lagging at least by 4 lakh tons with regard to the supply projections in 2020. Given an expected rise in milk demand, Kerala has to focus on raising its milk production by at least 50 per cent in 2030. The State should use the advantage of its higher productivity to achieve this objective through improved organisation of production.

Fourthly, in its efforts to raise milk production, Kerala would face a key constraint in the form of fodder production. Studies show that the ideal roughage to concentrate ratio for livestock is 60:40. In Kerala, the share of concentrate is currently above 60 per cent. This imbalance in feeding is known to create a number of stresses to the animals. Productivity can be increased more rapidly with an ideal 60:40 feed ratio; diets with more grain are more digestible and ferment faster, which provides nutrients to animals at a faster rate. Fibre-deficient feed can lead to the disruption of physiological mechanisms in animals; they lead to the accumulation and lack of absorption of fermentation acids in the rumen. The immunity to different diseases is also likely to be lower in animals with a higher concentrate feed ratio.

Data on the area cultivated with hybrid Napier are given in Table 7. As is clear, there was a decline in the area cultivated with fodder over the past few years. Kerala cultivates just over 2000 hectares of fodder, which produces only 46 per cent of the fodder requirements based on a 60:40 ratio. It is estimated that fodder cultivation would be required in at least 13,000 hectares if Kerala is to meet the roughage production target based on a 60:40 ratio. Subsidy to the tune of Rs 2000 per hectare is provided currently for fodder cultivation, but it has not helped.

Fifthly, in the case of meat, Kerala produces only about 10 per cent of its domestic requirement. But this is with regard to animals of the State slaughtered in the State. At the same time, if we consider animals transported from outside the State and slaughtered in the State, Kerala produces about 73 to 75 per cent of its domestic requirement. NCAER's 2014 projections show that the demand for meat in Kerala was 4.8 lakh tons in 2010, which was to rise to 6.5 lakh tons in 2020, 7 lakh tons in 2025 and 7.4 lakh tons in 2030. But Kerala produced only 4.5 lakh tons of meat in 2018-19. Production has to grow at least 4 per cent per annum over the next decade for Kerala to reach closer to self-sufficiency in meat production.

Table 7 *Area under fodder farms, Kerala, 2006-07 to 2018-19, in ha*

Year	Area under Hybrid Napier (ha)
2006-07	2280
2007-08	-
2008-09	1770
2009-10	2235
2010-11	2650

2011-12	3109
2012-13	2594
2013-14	2816
2014-15	3727
2015-16	2665
2016-17	2645
2017-18	2050
2018-19	2285

Source: Department of Dairy, Government of Kerala.

Sixthly, in the case of egg, the demand was estimated at 229 crore eggs in 2009-10, which was to rise to 300 crore eggs in 2020, 322 crore eggs in 2025 and 338 crore eggs in 2030. But Kerala actually produced only 229 crore eggs in 2018-19. This is close to what NCAER had projected as production under an optimistic scenario in 2020. But production has to grow by about 120 crore additional eggs over the next decade.

There are some important problems that arise when Kerala plans to expand the size of its poultry industry. We shall list some of them below:

- *Lack of sufficient land for starting poultry farms:* Kerala is a thickly populated state and poultry farms can be started only at sufficient distances from human dwellings.
- *High cost of labour:* The labour cost is very high in Kerala compared to other States.
- *High feed cost:* Chicken is simple-stomached and most of the poultry feed ingredients are also human food. At present, the cost of poultry feed is determined by a private consortium, as the market share of public sector poultry feed production is not significant. This increases the feed costs.
- *Reducing numbers of backyard poultry units:* The backyard poultry units were the strength of poultry production in Kerala. But their number is reducing at a fast pace along with the fragmentation of landholdings.
- *Lack of proper extension activities:* Farmers are not sufficiently aware about the modern methods to rear small numbers of chicken in partial confinement without causing serious damage to the vegetation. Such technologies are not easily accessible at low cost.
- *Reduced availability of quality cross bred chicks:* Cross bred chicks suitable for profitable backyard rearing are not easily available from reliable sources.

Finally, there is also enormous potential for the production of egg, meat and milk in ducks, goats and pigs. Both goat and pig population has grown between 2012 and 2019. Pigs are efficient converters of feed into meat and can fit into diverse systems of management. Cost and availability of feed and the price of pigs make piggery a very profitable vocation in rural Kerala.

Goat is a multi-functional animal and can efficiently survive on available shrubs and trees even in low fertility lands. Ducks are grown in the Kuttanad region and survive on a variety of food sources like grasses, aquatic plants, fish, insects, worms and small molluscs.

Specific Policy Pathways

Promotion of Larger Dairy Farms

We have already alluded to the relatively small size of dairy units in Kerala. Kerala should tap the potential of rural entrepreneurship and popularise the establishment of larger commercially run dairy farms in Kerala. Here, it is necessary that policy helps to converge three factors: high yielding cows, fodder/feed availability and marketing facilities.

Many of the existing regulations under the Kerala Municipal Building Rules 1999 to set up big dairy units (i.e., with 6 animals or more) discourage dairy entrepreneurs from taking up such ventures. For instance, the presence of more than 5 cattle (or for that matter, more than 5 pigs and more than 20 goats) implies that the unit would be considered “hazardous” under the 2012 rules of the Kerala Panchayati Raj Act. More recently, many allegations of harassment have arisen with regard to implementing the regulations of pollution control in dairy farms, especially those equipped with Bulk Milk Chilling Centres (BMCC).

Necessary steps may be taken to deregulate the sector so as to encourage commercial dairy farming on a larger scale. More recently, the National Green Tribunal (NGT) has issued a new set of guidelines for dairy farms and gaushalas where dairy farms have been moved from red category to orange category. Here, rules for dairy farms in Kerala have to be simplified and unified. Low cost Effluent Treatment Plants (ETP) have to be encouraged, financially assisted and popularised. The government will also have to explore higher subsidies for feed and electricity as well as offer tax exemptions to new plants. Presently, wet market sales attract no tax but packaged meat is taxed.

In sum, Kerala will have to improve the Ease of Doing Dairy through consciously designed policy.

Modernisation of Dairy Farming

Currently, the classical cooperative model dominates the organizational structure of the dairy cooperative sector. But many developing countries (even Anand co-operatives) are moving beyond the classical co-operative models to introduce commercial and competitive elements. India’s cooperative sector now faces stiff competition and is starting to lose ground to other competitors who are more professionally managed. The cooperative sector is responding by adapting its business models to the new generation models. For instance, cooperative dairy enterprises can now be registered as producer companies under the Companies Act. There is need to promote producer companies in the livestock sector in Kerala also. Graduation from subsistence, smallholder milk producers to small, commercial dairy farmers will be fundamental to put the strategy into action.

The government should undertake a study of the marketing and supply chains in the dairy sectors of the State, and initiate measures to remove bottlenecks from the producer to the consumer. The use of modern IT infrastructure, to develop the marketing network of milk, meat and eggs in the State should be encouraged. This includes the linking up of all dairy cooperatives in the State under single inter-connected software.

New Advances in Breeding

The following strategies are recommended for the cattle breeding.

- 1) A demand exists in the field for germplasm of high yielding dairy breeds. Such germplasm needs careful introduction in the field as the progeny may not be viable under less favourable farm conditions prevalent in the state. A two-tier system may be advocated with the first tier consisting of regular pedigree bull semen (average to moderately high yielders) for common livestock farmers and a second tier with semen from high pedigree bulls for elite cows of farmers having a conducive farm environment for animals with such genetic and phenotypic make up.
- 2) Field-level application of allied Assisted Reproductive Technologies like induced breeding and timely artificial insemination and the use of sexed sorted semen should be explored.
- 3) Infertility among crossbred cattle is a major long-standing concern. The state average for age at first calving should be brought down to 24-30 months from around 4 years. Inter-calving period should be brought down to 12-14 months from the present 22 months. While the problem has been known for some time, the exact reasons, which may be multiple, needs to be analyzed and identified for strategic interventions to be made. Hence, an integrated assessment of infertility prevalent in the crossbred dairy cattle of the state should be attempted, with the involvement of KVASU, AHD and the KLDB. Focus should be on zone-wise management of bovine infertility by establishing facilities/centres for effective surveillance, evaluation and intervention.
- 4) A plan for the conservation of indigenous breeds to preserve genetic variability (of breeds indigenous to Kerala), including recognizing of local breeds and use of assisted reproductive technologies, should be rolled out. Steps to be taken to register Kasargode Dwarf and other native cattle as breeds for effective utilization of central scheme in this sphere.

Introduction of Animals

Local availability of cows is a concern for farmers and hence cows purchased from outside the State under various government schemes. The concept of purchasing animals from outside the state to increase the State's animal population needs a review. This is not to belittle the gains to then State's animal wealth from the import of animals. But it has also been argued that animals

brought from outside the State have contributed to an increase in disease incidence in Kerala (including of haemoparasites and viral diseases).

Kerala may have to gradually phase out its dependence on cows from other States over the next five years. A technical committee of experts may be constituted to analyse the strengths and weakness of the importing animals. It has also been suggested that a quarantine period of 28 days should be insisted up on when cattle are imported from other States. Also, heifer nursery units based on rural entrepreneurship may also be promoted as a source of future milch cow herd. On similar lines, male calf/buffalo rearing units may also to be promoted as a source of good quality meat.

Identification and Registration of all Animals

The identification of animals is a major constraint in the collection of accurate demographic data of animals in the State. Lack of accurate data adversely affects the implementation of developmental projects as well as traceability of animal units.

Feed and Fodder

Kerala needs an appropriate fodder plan to raise fodder production. Currently, there are 5741 fodder plots in the State, as per the database maintained for Dairy department schemes. Of these 5741 plots, 4362 plots (or 76 per cent) are between 1 acre and 2.5 acres in area. There are 952 plots (or 17 per cent) of area between 2.5 acres and 5 acres. There are only 427 plots (or 7 per cent) of area more than 5 acres. Kerala may need to promote commercial cultivation of fodder on large scale if it needs to meet its demand in the next decade. Suitable contract farming models should be explored to promote fodder cultivation.

- 1) Promotion of commercial fodder production with an assured market through co-operative societies and linking fodder cultivation with MGNREGS should be attempted. The incentives should include an assured market price to the producers.
- 2) Promotion of fodder cultivation in waste lands should be encouraged through Kudumbasree units/SHGs/entrepreneurs, and quality of fodder produced should be ensured through proper soil management.
- 3) Hydroponics and Azolla cultivation schemes implemented through departments should be reviewed by a technical committee of experts.
- 4) Malabar Rural Dairy Foundation (MRDF) may be entrusted with the collection, bailing, transport and distribution of straw from intensive paddy cultivation areas to needy farmers.
- 5) Since the price of milk cannot be increased, subsidy should be given in the form of feed as an incentive to the farmers.

Surplus of milk and product diversification

One major lesson learned from the Covid-19 pandemic in the animal husbandry sector in Kerala is the need to attain a greater degree of self-sufficiency in handling animal produce. The pandemic has also reminded Kerala that it is close to attaining self-sufficiency in milk

production. In the coming years, the State needs to prepare itself for a handling a situation of surplus milk. Thus, Kerala needs a modern milk powder plant as well as an evaporator plant to convert and store surplus milk as milk powder and condensed milk. Prior to the erection of such a facility, feasibility studies should be carried out to ascertain the availability of excess milk throughout the year.

We also need to aim at developing the production of value-added commodities from milk, such as cheese and yogurt. This implies setting up of advanced product diversification facilities in the existing dairy plants.

The quality of raw milk at farm level is of great concern. This area needs attention. The cold chain maintenance from farm to fork has to be ensured. The milk procured at the farm level has to be cooled in a short span of time to reduce the bacterial load. This needs more financial support to ensure cold chain maintenance. At present, there are only 442 Bulk Milk Chilling Centres (BMCC) in the State, with a capacity of 17.7 lakh litres per day. This needs to be increased to suit the milk procurement capacity of the dairy cooperatives. Where necessary, or cluster BMCCs with linkages to a maximum of 5-6 dairy cooperatives have to be promoted. Assistance is needed for the installation of around 150 BMCCs throughout the State with an average installed capacity of 2000 LPD.

Promoting meat production and value addition

In order to develop the base of meat production in the State, a Meat Sector Strategic Plan (MSSP) should be developed. The objective of MSSP should be to frame an overall strategic plan for the meat sector in Kerala, comprising production, processing and marketing of meat and meat products. This should include separate plans for cattle/buffalo meat, chevon, pork and chicken. Some of the challenges such a plan would face are as follows:

- 1) *Backward integration* for rearing of animals ensuring veterinary health coverage and concentrated feed, individual identification and traceability, would be a requirement. We have to build better forward integration of the products with markets through the establishment of supply contracts with domestic retail chains, restaurants and hotels, as well as market facilitation measures.
- 2) Kerala will have to build *new infrastructure* for meat processing plants to cater to the northern, central and southern districts. It may be best to set up such plants in border districts to reduce costs of transport of live animals across the State.
- 3) In *piggery*, where some extent of geographical separation of production from residential areas is deemed necessary, Kerala could think of using vacant areas in plantation land. Buildings and a small area could be rented out, and the farms could also provide organic manure for the plantation crops.
- 4) *Information and training* will have to be imparted to all the stakeholders in the value chain to support informed and business-oriented decision-making, especially in the production and processing sectors. Further, *capacity building* would be necessary to expand skilled and technical manpower in slaughtering, processing and packaging of meat.

- 5) Alongside, the State will also have to create an *integrated cold supply chain* for retailing meat and meat products.
- 6) *Value addition* in meat and meat products through developing entrepreneurs for ready-to-eat and semi-processed meat products in the domestic market is important. At present, only a small percentage of the meat produced is converted into value-added products. Most meat is purchased by consumers in the fresh/frozen form for conversion into products at homes or restaurants. The need for satellite processing units – centrally located slaughter houses and a number of associated centres or processing units – has to be planned for.
- 7) Kerala will also have to explore options for converting inedible offal and animal wastes from the meat plants into *economically useful products*. There is huge potential for processing animal tissues to produce valuable proteins/materials, which have a global and domestic market.
- 8) Farmers/entrepreneurs in meat production have to be ensured *adequate amount of credit* at subsidised rates of interest. Kerala Bank and other primary cooperative societies should be requested to develop specific credit packages for meat production.

Quality issues in meat production

The real potential of the meat sector in Kerala has not been fully tapped. The requirement of meat, especially beef, in Kerala is met from animals brought for slaughter from outside Kerala, i.e., Andhra Pradesh, Karnataka and Tamil Nadu. With only a handful of formal slaughter houses in operation and a large percentage of informal slaughter being carried out illegally (around 60 per cent of the informal units are estimated to be unregistered), and without any veterinary inspection, the meat sold to the public is largely unclean. It has also resulted in large-scale pollution in the surrounding areas. Animals are slaughtered in unclean surroundings, by butchers with little expertise in hygienic meat production and many times on roadsides. Meat stalls are also open stalls where carcasses are hung in full view of the public in unhygienic settings. Waste and effluent management is practically non-existent. Biogas plants have been installed in a few units for waste management, but they are dysfunctional due to lack of skilled supervision.

The entire chain of operations leads to breach of public health, with serious consequences for animal welfare, food safety, occupational health, and environmental hygiene.

For processed meat, the drivers of demand are hygiene, quality and food safety. However, significant investment is required to achieve high standards. Rising per capita consumption in domestic market and increase in global demand open new opportunities to meat and poultry industry to adopt modern technologies in production, preservation, processing, value addition and consumer packaging. Currently, value addition in meat sector is almost non-existent. For the meat sector to be more vibrant, profitable and provider of safe meat, it is necessary that a perceptible shift from unorganized to organized sector takes place. This calls for a strategic plan to modernise the meat production sector towards the production of clean and wholesome meat based on a Clean, Green and Ethical (CGE) farming and production system.

Promotion of poultry farming

In the 1970s, Kerala was exporting eggs to other parts of the country. Chengannur and Kottarakkara railway stations were famous as centres of rail transport of eggs to other States. That is, Kerala was producing more eggs than what was demanded within the State. However, today, the State imports approximately 2 crore eggs per day from other States. It is estimated that about Rs 800-1000 crore is the amount of revenues flowing to other States due to these imports. This situation has to be reversed. It is also estimated that an average of one million broiler birds per day are being slaughtered in Kerala to meet the domestic chicken demand. But the broiler industry continues to be under the clutches of large-scale producers headquartered in the neighbouring States. At present, only 0.1 per cent of the broiler poultry market share is handled by the government and public sector undertakings including cooperative sector. This also needs redressal.

A key role in this regard will be played by the Kerala Chicken Project, introduced during the 13th plan. In 2018-19, the Animal Husbandry department, along with Kudumbashree, Kerala State Poultry Development Corporation (KSPDC), Meat Products of India (MPI), KVASU and the Brahmagiri Development Society (BDS), proposed to implement the Kerala Chicken Project. This project is envisaged to cater to the present and future needs of production, quality assurance, processing and marketing of chicken following an efficient supply chain model. According to the mission statement of the project, it aims to “meet the domestic demand of poultry meat, by producing safe chicken meat inside the State through healthy and hygienic practices and selling at affordable price, and thereby providing enterprise opportunities to farmers, especially the women, and the consumers.” It envisages the establishment of broiler breeder farms in Kerala to produce required broiler commercial chicks for farming at reasonable price, to give assistance to budding broiler farmers, to create a fair and stable market price through a distress relief fund and to achieve 100 per cent market share in the broiler industry in a phased manner.

In the 14th plan period, the following issues will have to be addressed.

- A special purpose vehicle will have to be created in the first year to enable resource mobilization for project.
- Two big broiler breeder farms in every district will have to be set up with the collaboration of private entrepreneurship, LSG support and Kudumbasree to produce quality day-old chicks under strict quality control for supply reasonable price.
- About 150 hi-tech commercial broiler farms operated by farmers will be required throughout Kerala, again with the support of private entrepreneurs, Kudumbasree, department, KSPDC and other stakeholders.
- Infrastructure facility will be required in every district viz., processing plants, cold chain facilities for transportation, cold storages, marketing outlets and sales channels such as supermarkets and own outlets by name “Kerala Chicken Shoppe”.
- Kerala Chicken Food Processing Parks will have to be established in at least 4 districts with common facilities/mother facilities.

- Chicken rendering plants will have to be established in every district for scientific waste management and safeguard the environment. This will also cater to converting the waste to by-products like organic manure, pet/fish foods/feed ingredients.
- About 1000 Kerala Chicken outlets with cold chain facility will have to be established in the State for selling safe to eat chicken.
- A cold chain facility with about Rs 200 crore capital infusion will be required with packhouses, reefer vans and cold storages in the sales outlets. This will require responsible investment from major cooperatives and private players under strict government supervision.
- Quality assurance of meat for food safety will have to be maintained through NABL or similar accredited private labs established within the radius of 2 km of major production centres.

Promotion of duck farming

Some amount of planning has to go into how to intensify duck farming in Kuttanad. The Kuttanad ducks are the indigenous *desi* ducks of Kerala, which include the *Chara*, *Chemballi*, *Pulli* and *Black* varieties. Among these four varieties, *Chara* and *Chemballi* are the two familiar varieties. They are hardy water fowls, acclimatized to the geographical area and resistant to many diseases. Even though Kuttanad ducks are dual purpose in nature (i.e., reared for egg and meat), they are reared in Kuttanad mainly for egg production. This is because even though consumers prefer Kuttanad duck meat for its tasty and nutritious meat, farmers do not prefer to rear them exclusively for meat purpose due to their low body weight, meat:bone ratio and feed efficiency. Presently, exotic meat type duck breeds like *Vigova Super-M* and *White Pekin* are reared for meat purposes, but their major drawbacks are low egg production, high costs of day-old ducklings and less consumer preference for white feathered birds.

One major issue faced by duck farmers is the high level of mortality due to the outbreak of Duck Pasteurellosis, Duck Plaque and New Duck diseases. Around 90 per cent of the ducks are reared without any systematic or scientific feeding practises or disease control measures. Ducks largely rely on spilled grains, grass hoppers, slugs, snails, small crabs, insects, mosquitoes and other larvae and small fishes from the harvested paddy fields, ponds, water ways and rivers. The geographical peculiarities of Kuttanad invite a large number of migratory birds, which in turn leads to infections like Bird Flu or Avian Influenza among the local duck population.

Lack of knowledge about vaccination against these diseases and scarcity of vaccination experts are some of the other factors leading to high levels of duck mortality. Kuttanad urgently needs a large project that would vaccinate most of the ducks within a strict time frame. It also needs proper disease surveillance programmes and vaccination of nomadic ducks to prevent mass deaths. A cadre of field workers has to be created for this purpose. We suggest that a major project be allotted to the KVASU, Pookkode towards this purpose for exclusive operation in the Kuttanad region. This project site should have infrastructural facilities to provide and distribute 5 lakh day-old ducklings per year. In addition, the project should create facilities for providing services like disease diagnosis, feed analysis, training to duck farmers, custom hatching facilities for duck farmers (aiming at about 15,000 eggs/week) and field veterinary services. It is estimated

that for producing 5 lakh ducklings, 4000 parent stocks have to be reared, which needs around 12000 ft² shed area. Additionally, area will be required for a hatchery, an experimental shed, a disease diagnosis and feed analysis laboratory, a waste treatment plant and a training centre. The Kerala State Planning Board has already provided an initial allocation to the KVASU to begin work on this project. We recommend that Kerala Government should provide 10 acres of land to the KVASU in Kuttanad to establish the project site.

Providing insurance cover to the duck population is essential to minimize financial losses to the duck farmers in the aftermath of disease outbreaks. Generally, insurance companies are not willing to take up duck and poultry insurance. Government intervention should be ensured in this regard so that insurance cover is ensured for both ducks and poultry.

Promotion of veterinary entrepreneurship

Comprehensive entrepreneurship development programmes are required to tackle the critical production and skill gaps in Kerala's livestock sector. Entrepreneurship, innovation, skill development and capacity building have to emerge as potential areas of focus in veterinary extension. Promotion of livestock, dairy and poultry entrepreneurship programmes to help returning NRKs, unemployed youth and women establish commercial livestock ventures is extremely critical in a post-Covid era.

Precision farming, farming based on agro-ecological zones and production of safe to eat products need more attention. During the 13th plan period, there were plans to establish "start-up villages" in livestock production based on agro-ecological zones. This project envisaged integrating agriculture, livestock and fisheries to produce safe to eat products with less than permissible level of pesticide and antibiotic residues. There was also a proposal to establish "agri-smart villages" practising high-value dairy, poultry, goat production and piggery, involving the promotion of commercial ventures, high-tech farming, processing and value addition, e-marketing and export-oriented production. Both these ideas could not take off during the 13th plan period. Such innovative ideas have to be consciously promoted during the 14th plan period.

Finally, a 24*7*365 common resolution centre, which works to solve the issues faced by entrepreneurs, should be set up to cater to the requirement of the primary sector. This should be linked to the questions of production, production support and marketing as part of the *Subhiksha Keralam* project. This should be a central nodal point and could be called SK Suvidha, and manned by well-trained professionals.

CHAPTER 5.2
INLAND AQUACULTURE IN KERALA:
POSSIBILITIES OF RAPID GROWTH OF PRODUCTION AND INCOME

I
INTRODUCTION

The total population of fisher folk in Kerala is 10.44 lakhs including 2.4 lakhs of inland fishermen. Currently, Kerala has 32 hatcheries for the seed production of freshwater and brackish water fish and shrimps. Fish seed production was pegged at 353.55 lakhs in 2019-20, meeting only 25 per cent of the seed requirement of the State. Maximum production came from the hatcheries at Malampuzha Dam and Peechi Dam. About 648 lakhs of shrimp seeds were produced in 2019-20 comprising of *Penaeus monodon*, *P. indicus* and *Macrobrachium rosenbergii* (scampi). These numbers indicate Kerala's potential resources and throw light on the insights for the future course of action.

Kerala is bestowed with a vast area of 5295.93 ha of freshwater ponds and tanks, 1620 ha of freshwater lakes, 65213 ha of brackish water area and 46128 ha of backwater stretch, suitable for aquaculture. The State has a total coastal length of 590 km. Kerala is also endowed with 41 west flowing and 3 east flowing rivers with a total length of 3092 km with significantly long stretches suitable for pen and cage culture.

Yet, as in the case of food grains and vegetables, Kerala is deficient in fish production. It is estimated that the total domestic fish consumption in the State is approximately 9.12 lakh tons/annum, or about 2000-2500 tons per day. Of the annual consumption, about 3 to 4 lakhs tons (or about 60 per cent) is imported from other States/countries, especially in the urban areas. Further, a large share of Kerala fish production is marine fish. The total marine capture fish production in 2018-19 was more than 600,000 tons while inland aquaculture contributed only about 25,000 tons.

According to a study conducted by Central Marine Fisheries Research Institute (CMFRI), the demand-supply gap for fish will widen in Kerala, which indicates that the State will still require 50 per cent of fish from other States/countries to meet the domestic demand by 2035. At the same time, Kerala has immense potential for developing inland aquaculture with its vast aquatic resources in brackish water, sea water and freshwater. It is high time that the State concentrated more than ever before on this food production system. Aquaculture has attained the status of a lucrative business activity more recently, with elaborate cage facilities in inland and brackish waters supported by multi-species seed production hatcheries. In many regions of India, traditional fish farming areas is slowly getting transformed into intensive fish/shell-fish farms. Kerala should use this potential to expand inland aquaculture in the next ten years.

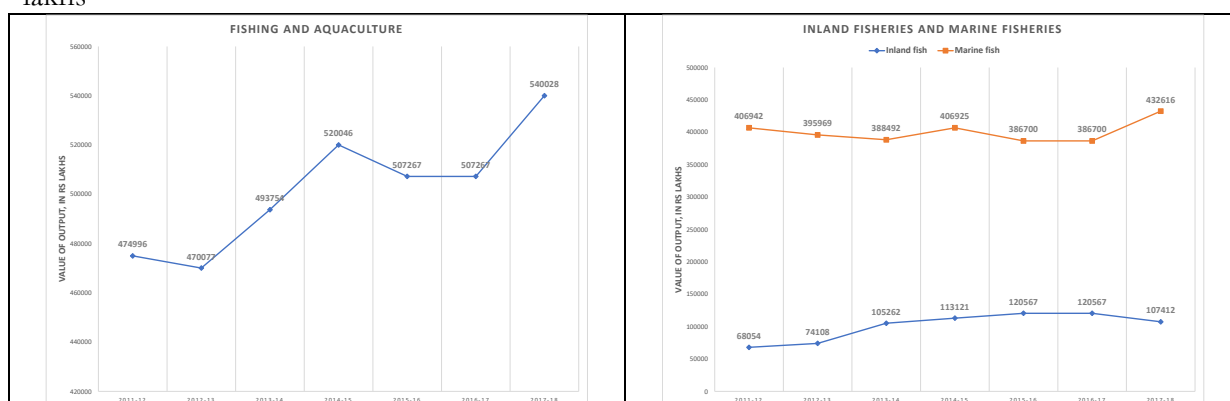
A quick historical overview of the aquaculture sector will show that shrimp farming has a history of many centuries in the State. The major catch was coming from shrimp filtration or from inland/near shore waters. Even in the beginning of the 20th century, there was shrimp export from Kerala to European countries like in the form of dry shrimp (*chemmeen parippu*, or peeled, deveined cooked and dried). In the post-independence period, mechanization and motorization intensified. The landings of '*karikkadi*' shrimp (*Parapenaeopsis styliifera*) improved significantly and other forms of processing like freezing and canning became popular. Trials on scientific shrimp farming started in the 1950s. It took a slightly moderate density mode (i.e., a stocking rate of 5 to 8 shrimp per m²) only in 1980s with the commercialization of the penaeid seed production. In

the mid-1990s, the white spot disease broke out in Kerala, which was a severe blow to shrimp farmers.

In the freshwater sector, the culture trials of fishes like Indian Major Carps were initiated by the Fisheries Department in 1970s and 1980s. Indo-German project operated in Malampuzha during this period played a significant role in promoting reservoir fisheries through artificial production of carp fingerlings in captivity. At the same time, the transplantation of Indian Major Carps (IMC-catla, rohu and mrigal) has not helped the aquaculture sector due to the low consumer preference of carps. The comparatively low annual fish production from aquaculture in Kerala (25,000 tones) clearly indicates the low productivity of the existing system. Most importantly, these fishes do not fetch the due market demand and price among the “sea-fish loving” consumers. In the near future, carps may get slowly replaced in small scale systems with Tilapia, Basa, Anabas, Murrels, Pearl sport etc. and may remain only as a part of reservoirs fisheries.

In Figure 1, we have provided the graphs for the value of output (VOO) from fisheries in Kerala after 2011-12. Clearly, Kerala’s VOO in fisheries as a whole rose by 13 per cent between 2011-12 and 2017-18. The contribution of the inland sector is less than 20 per cent in the total VOO from fisheries and aquaculture. In 2018-19, fish production Kerala was estimated at 1.92 lakh tons from inland sector and 6.1 lakh tons from marine sector. The growth in the VOO from marine fisheries sector was largely stagnant (a rise of 6.3 per cent), while there was substantial growth in the VOO from inland fisheries sector (a rise of 58 per cent). It is this growth in inland fisheries that bodes well for the future of Kerala’s fisheries sector.

Figure 1 Value of output (VOO) from fisheries and aquaculture, Kerala, deflated, 2011-12 to 2017-18, in Rs lakhs



Source: DES.

II SEED PRODUCTION SECTOR

It is estimated that there is a requirement of 12 crore fresh water fish seed in Kerala for the implementation of the aquaculture programme (*Janakeeya Matsya Krishi*) of the Fisheries Department. A rough estimate shows that the indigenous production of freshwater fish seeds in Kerala is as low as 3.5 crore, which is produced mainly by the government or its subsidiary hatcheries leaving a deficit of 8.5 crore seeds. So, at present, the difference is imported from other States.

Apart from government projects, there are thousands of farmers engaged in fresh water aquaculture projects adopting advanced technologies like biofloc, RAS and Aquaponics. In 2019-20, farmers of the northern districts of Kerala are reported to have purchased about 2 crore

fresh water fish seeds (mainly for RAS/Aquaponics/Intensive pond culture) even after we exclude the seeds used for government projects. Even now, cargo flights are being chartered exclusively for bringing seeds to Kerala and sold at the airport itself. Seeds supplied by middlemen are proven to be of inferior quality and the suppliers loot the farmers by supplying disease affected seeds at exorbitantly higher prices. As a result, the production is low. To control the unauthorized seed suppliers, a Fish Seed Act has been enacted by the government. The establishment of multi-species hatcheries, which can be operated on season/species basis for meeting the seed requirement, is the only way to sort out the problem of middlemen. The species that have high potential in the Kerala context are:

- Tilapia
- Murrel
- Basa
- Anabas
- Carps
- Giant Freshwater prawn
- *Penaeus vannamei*
- *Penaeus monodon*
- Asian sea bass
- Pompano
- Cobia
- Mulletts
- Crab
- Mussel

Among the above species, Kerala has severe shortage of the seeds of Murrel, Asian sea bass, Mulletts, Basa, *P. vannamei*, Mussel etc. So, establishing hatcheries for these species would be an ideal step in the way forward.

III

FARMING OF POTENTIAL SPECIES AND DIVERSIFICATION

Tilapia

Tilapia is known as ‘aquatic chicken’ due to their high growth rate, adaptability to a wide range of environmental conditions and ability to grow and reproduce in captivity and feed voraciously. Tilapia can withstand high water temperature and low levels of dissolved oxygen. Their optimum temperature range is between 20-30°C; they can tolerate temperature as low as 12°C. Tilapia easily tolerates brackish water conditions also (salinity up to 20 ppt). They can be stocked at high densities (10000-20000 no./ha in ponds and up to 4 to 5 lakhs in intensive systems like biofloc and RAS) compared to other fishes. This is why this fish has become an excellent candidate species for aquaculture in tropical and semi-tropical environments.

Tilapia culture is currently practiced in more than 100 countries all around the globe. Nile tilapia is generally the most important cultured species on account of its fast growth rate, adaptability to a wide range of culture conditions and high consumer acceptability. Nile, Red, Deep black, Deep red and Chitralada are considered to be superior to the ordinary tilapia (*Tilapia mossambica*). This species breeds prolifically in the culture fields from very young age and thus the culture gets failed because of the stunted growth of the individuals owing to very high numbers.

Murrel culture

The potential of Murrel as the candidate species for freshwater aquaculture hasn't been properly utilized by our country but for a few States like Andhra Pradesh and Tamil Nadu. Kerala is one of the leading States among the country in terms of brackish water aquaculture. But no serious effort has been undertaken to develop brackish water fin fish culture, cold water fish culture, culture of indigenous fish species etc.

Snakehead or *Channa striatus* is a native freshwater fish of tropical Africa and Asia. It belongs to the family Channidae and commonly known as Murrels or serpent-headed fish. It can breathe atmospheric air and it is carnivorous in feeding habit. It is widely consumed for its nutritional value as well as for its beneficial effect in wound healing as its flesh contains high level of arachidonic acid. This medicinal property, distinctive aroma, tenderness and fewer spines made *C. striatus* commercially important fish species in many countries such as India, Philippines, Thailand, Cambodia and Vietnam. It has a culture history of four decades in India with the first demonstration in the Madras Sunkesula fish farm, Andhra Pradesh by the State Fisheries Department. Currently, several Indian States are doing pond culture of *C. striatus*. In many places, Murrels are cultured with Tilapia as polyculture to control the over population of Tilapia. Vietnam is the country which made historical revolution in Murrel culture of late. The current production of Murrels in Vietnam is as high as 4 lakhs tons per annum.

Vannamei shrimp (Penaeus vannamei) culture

Though an American shrimp, Vannamei was legally imported into India way back in 2009. Shrimp being one of the most expensive and sought-after sea foods in the world, its culture and seed production have been receiving ample attention in many countries including India. In India, farmers from Andhra, Gujarat, Tamil Nadu etc. are making good profits from shrimp farming.

KUFOS during 2011 to 2017 period could take initiative towards popularizing Vannamei farming in many places through a plan scheme. The university had trained hundreds of farmers in that period. If done scientifically with the university's protocol, a net profit of Rs 10 lakhs can be obtained within 120 days of one crop including preparation and harvesting from 1 ha area with a productivity of 10 tons per ha. One kg of shrimp fetches Rs 300 to Rs 500 and there is heavy demand in the export market. In some places, even two crops can be taken.

Mullet

Grey mullet (*Mugil cephalus*) is an ideal candidate species for brackish water aquaculture both in estuarine fields and homestead ponds, preferably integrated with other species. Mullet is an integrated component of traditional brackish water aquaculture along the Indian coast and the mangrove forests provide an excellent ecosystem for its larval, juvenile and sub-adult phases. The mangrove deforestation has been a serious ecological problem which would have far reaching adverse impacts on physical, chemical and biological components of the aquatic ecosystems. Most mangroves have been highly degraded by humans for agriculture, harbour development, salt production, industries and shrimp farming. The destruction of mangroves all along the country have indirectly affected the mullet population. Though it is considered to be one of the tastiest fishes available in the market, in most of the urban areas of the country, its scientific farming is yet to be popularized, mainly due to two reasons: (a) shortage of hatchery produced seeds; and, (b) inherent low growth rate of the species.

While the freshwater carps like catla and rohu (Indian major carps) grow to the size of 1000 g in eight months and Chinese carps like silver carp and grass carp to 1500-1800 g in a year, mullets record comparatively low growth rate of only 500 to 700 g/year. But while carps fetch the price of Rs. 100 to 150 kg, mullets fetch Rs. 500 to 700 per kg in the domestic market. This price advantage attracts the farmers to its culture in the coastal areas. The setback faced by shrimp farms due to WSSV and other health issues also make the farmers to choose mullets for stocking in their ponds. The various combinations of striped grey mullet and milkfish are considered as the successful models in brackish water farming in India.

Crab culture

Crab culture has been practiced popularly in brackish water (where the salinity of the water will be between 5-25 ppt). Shrimp and crab farming have been the most lucrative farming methodologies since decades, as these are very expensive commodities in the global export market. There are two types of crab rearing: batch culture and crab fattening.

Batch culture: Here the uniform sized crablets are stocked in the “grow- out” ponds after taking due precautions. The stocking density is 1 to 2 crabs per m². The culture duration is 6-8 months and the production rates will vary from 1 to 2.5 tons per hectare with 50 per cent to 80 per cent survival.

Crab fattening: Here the water crabs are collected from the wild and stocked in the ponds. After a period of 20 days, the shells get hardened and the marketability of the crabs get increased. In certain other cases, the immature female crabs are stocked for a period of a few months. The ovary with eggs gets developed during this time, which is a much sought-after product in the international market. “Mother crabs” sometimes fetch three times higher price than the normal crabs.

IV

ORNAMENTAL FISH SECTOR

Aquarium keeping is supposed to be the second most popular hobby around the world after photography. The global trade of ornamental fish is as high as 10 billion USD per annum. Interestingly, Singapore with a total geographical area of just 719 km² is the leading nation in aquarium industry, with about 60 per cent of the total stake. Though India has more than 2500 species of potential ornamental fish species, our trade volume remains too negligible; even here, more than 88 per cent is contributed by the North Eastern region. Kerala, though endowed with rich aquatic resources and species diversity, still lags behind in the ornamental fish business. A few suggestions are listed below for future planning.

The export of species directly caught from the wild (rivers/reservoirs/lakes) should be strictly banned as it will affect our biodiversity. Instead, backward hatcheries need to be set up for the seed production and such seeds can be reared in rearing units and exported.

The industry should focus on domestic marketing and exports. In the domestic market, fishes like gold, guppy, molly, fighter, angle, gouramy, Oscar, cichlids etc. are traded while only high value species are preferred in the export market. According to the quality, the fishes can be graded and exhibited and marketed separately.

Koi carp is one of the highly priced ornamental fishes fetching crores of Indian rupees per piece according to the colour and body markings. Japan is the leading country in ‘Koi’ trading. The

bigger fishes fetch higher prices in the market. In Japan, 'Koi' takes 4 to 5 years to attain a size of 4 to 5 kg while the same weight can be achieved in Kerala within 2 to 3 years due to the temperature difference. If the government supplies Japanese imported 'Koi', the local farmers can grow it and market it in Japan through the government channels.

V FUTURE DEVELOPMENT OF AQUACULTURE IN KERALA

Advanced technologies in aquaculture

Biofloc

A huge quantity of feed (between 20 per cent and 80 per cent) is dissolved/wasted in the pond/water or settled at the bottom as part of the sediments. As a result, ponds containing a high load of nutrients and toxic residues become undesirable to the fish for the optimum growth. Fish growth is affected and intensification is limited. Biofloc Technology (BFT) is one of the solutions for addressing this problem effectively. BFT is a technique for improving the quality of water in aquaculture by balancing carbon and nitrogen in the livestock system. The principle of this technique is the generation of nitrogen cycle by maintaining higher C:N ratio through stimulating heterotrophic microbial growth, which assimilates the nitrogenous waste that can be exploited by the cultured species as a feed. BFT is thus a sustainable method for controlling water quality, with added value for microbial protein availability as a food source.

In aquaculture, the major economic factors are the feed cost (accounting for 60-70 per cent of the total production cost) and most limiting factor is the water/land availability. High stocking density and rearing of aquatic animals requires wastewater treatment. BFT is not only effective in treating the waste but also grants nutrition to the aquatic animals. Government of Kerala is promoting BFT wherever possible. Since it is viable technology practiced in many countries, we should give more thrust to this in the future.

RAS

As indicated in the account on BFT, in scientific aquaculture, the cultivable species need to be fed with quality feed (with optimum protein content) on a regular basis. So, the system gets polluted soon with the unused feed and excreta of the animals getting settled in the tank/pond bottom. For disintegrating these waste materials, large quantities of oxygen would be utilized and ultimately the concentration of dissolved oxygen in the water gets reduced leading to fish kills due to asphyxia. So, to maintain the water quality, efficient filtration systems need to be installed for obtaining optimum growth and of fish and ensuring the animal welfare. The same water after filtration (mechanical/biological/chemical filtration) is flowing back to the culture system so that water quality is maintained well throughout the culture. The system is known as RAS-recirculating aquaculture system.

Though this is an energy intensive and expensive mode of aquaculture, it is ideal in urban conditions wherein the water area available for aquaculture is limited. Since Kerala is fast moving towards urbanization, RAS system can be an effective means of aquaculture in our State. Kerala should give due importance to this system to promote the self-sufficiency in fish availability.

Aquaponics

Aquaponics is a synergic system between fish and plants and the term stems from two words: aquaculture (the growing of fish in a closed environment) and hydroponics (the growing of plants usually in a soil-less environment). The fish and plants grow together in one integrated system. The fish waste provides an organic food source for the plants and the plants naturally filter the water for the fish. The third participant in the aquaponics system is microbes (nitrifying bacteria). These bacteria convert ammonia from the fish waste first into nitrites, and then into nitrates. Nitrates are the form of nitrogen that plants can uptake and use to grow. Solid fish waste is turned into vermi-compost that also acts as food for the plants.

In an aquaponics system, water flows from the fish tank into a biofilter where bacteria break down the fish waste into an organic nutrient solution for the growing vegetables. The plants then absorb the nutrients from the water which essentially cleans it before being re-circulated back into the fish tanks. As can be imagined, this is also a dynamic and energy intensive system and needs utmost care for the successful implementation. Aquaponics should also be given due thrust in Kerala's policy on fisheries.

Intensive aquaculture

Other than the above-mentioned systems, aquaculture can also be practiced intensively by other modes too like flow throw system, cage culture and pen culture. Providing high quality feed is followed here also and water quality maintenance is given importance. Cage culture in the reservoirs, back waters and marine environment has immense potential for sustainable development. Since there is continuous water flow in pen and cage culture systems, the fish grow well with a high productivity of 15 to 40 kg per m³.

Reservoir based scampi production

The Giant freshwater prawn, *Macrobrachium rosenbergii*, commercially known as “scampi”, has been a major delicacy and a commodity of export for many decades from Kerala. Its commercial seed production was standardized by Prof. (Dr.) C. Mohanakumaran Nair (former Professor of erstwhile the College of Fisheries) and his team way back in 1990s, which gave a boost to the freshwater prawn farming industry in India. In 2005-06, the total national production of the species even reached a peak of 35,000 metric tons. Unfortunately, the popularity of the species declined afterwards due to a viral disease. All the scampi hatcheries got converted to *Penaens vannamei* hatcheries during this period. So, the shortage of seed is a major problem faced by this sector at present.

M. rosenbergii may be the one and only species that goes to the export market from the freshwater sector of the country. Culture/fishery of fresh water prawn has been a practice from time immemorial in Kerala. *M. rosenbergii* is cultured either alone or in combination with carps in India. Monoculture of *M. rosenbergii* is almost confined to earthen ponds with low stocking densities of around 20,000-50,000/ha. The species has the potential to grow to the size of 80 gm to 120 gm within a period of six months. The polyculture method is considered an economically viable mode of fresh water prawn culture.

There is an urgent need to revamp the freshwater prawn farming in Kerala. At the same time, the scampi exporters vouch that only the large sized prawns have overseas demand with high buying price. Such prawns with global appeal can be caught only from natural water bodies like lakes and reservoirs. Since the lake environment in Kerala has deteriorated due to pollution and other anthropogenic reasons, the reservoirs offer an excellent abode for scampi. The deep and undisturbed reservoir environment can be well used for scampi culture with the tribal population

on a buy-back scheme basis. In future, it may be possible to have a GI certification for the scampi reared in Kerala reservoirs.

Homestead ponds

Kerala should maximise its utilization of water bodies for productive purposes. Domestic pond aquaculture can be used as an excellent mode of aquaculture to meet the fish requirement of individual families. It should be given due thrust in the future planning spelling out the specificity of species and management measures to be adopted. Tilapia, Murrel and Anabas are ideal candidate species for homestead farming which can be done with limited inputs.

Organic shrimp farming

Of late, fish consumers are raising concerns over food safety issues related to aquaculture products and are looking for aquatic proteins produced through environmentally sound and socially responsible protocols. Government regulatory agencies have come up with better management practices (BMPs) to address the potential negative impacts of shrimp farming towards assuring sustainability of aquaculture development. Possible regulations of aquaculture include bans, restrictions, land use classification and zoning, environmental impact assessment, mitigation plans, permits, user fees and monitoring protocols in many parts of the world with varying degrees of effectiveness.

There is immense potential for organic shrimp farming in Kerala. Kerala has a long history of organic shrimp farming. Traditionally, paddy-cum-fish culture used the “trapping cum holding system” in which shrimp seeds along with other assorted fish were allowed to enter the fields through the water inlets (sluice gate) with the tidal flow. The shrimps which remained in the fields for a particular period achieved marketable size and were harvested using sluice bag nets during the tidal ebb. This system was popularly known as “shrimp filtration”.

The major species of shrimps caught in this system are *Penaeus indicus*, *P. monodon*, *Metapenaeus affinis*, *M. dobsonii* and *M. monoceros*. The spawning of these species takes place in the Arabian Sea and the young ones drift to the inshore areas through the tidal inflow for grow out. During June to August, the west coast of India receives south-west monsoon, which results in the drastic decline of salinity in the brackish water fields. The thorough washings reduce the salt content of the soil, which makes it fit for paddy cultivation. The rice variety used for cultivation is called as “Pokkali” in central Kerala, which is tolerant to salinity and high-water levels. The ‘traditional’ way of farming shrimps along with paddy gave the shrimp and paddy productivity of approximately 600 kg and 1000 kg per ha per crop respectively, which was slowly transformed to an “improved traditional system” (yielding 600 kg to 800 kg shrimp per ha per crop with limited stocking), extensive system (800 kg to 1000 kg per ha per crop with slightly higher stocking), modified extensive system (1.0 tons to 1.2 tons per ha per crop with ample stocking), semi-intensive system (1.2 tons to 2 tons per ha per crop with stocking 60,000 to 80,000 seeds per ha). Paddy was sidelined over time in such systems.

During the last two decades, there has also been an increase in the number of eco-certification schemes for organic aquaculture. The demand for organic-certified seafood has been growing, particularly in the European countries. During the end of the last decade, the global organic aquaculture production was around 53,500 tons with a total market value of 300 million USD. Organic aquaculture products usually fetch a premium price over the conventionally produced products.

Wherever Vannamei shrimp culture is not possible due to ecological reasons/biosecurity concerns, Kerala could popularize organic tiger shrimp farming (species: *Penaeus monodon*). This is Kerala's native shrimp. Unused or underused brackish water fields including mangrove areas can be extensively used for organic shrimp farming. There is high demand for organic shrimp in certain countries like Switzerland, Austria, UK and Germany. Vietnam has extensively invested in the export of organic tiger shrimp. In Vietnam, the area of such ponds varies from 100 to 1000 ha with the yield of 1 to 2 tons per ha. In Kerala, the fields left idle (with mangrove vegetation etc.) in coastal and back water premises can be dyked (with strong and broad bunds) for holding the brackish water. Large unused areas (under the Department of Revenue) can be converted to organic shrimp production fields. Large sluice gates will have to be constructed wherever necessary. Local groups including Kudumbasree can be entrusted to look into the day-to-day operations of the area including fishing, pre-processing, processing and marketing.

Value addition

Most aquaculture products in Kerala are sold as raw without any value addition. This stands true even for the shrimp, which is a highly priced commodity. Most of the shrimp has been exported to various countries in block frozen form either as whole or headless. The importing countries make an array of expensive products from the Indian shrimp and realize huge margins. So, value addition is the key aspect in any marketing.

VI SUMMARY

The expected outcomes of policy in inland aquaculture should be:

- To create an additional employment of skilled and semi-skilled nature.
- To produce an additional quantity of fish and shrimp
- To address food and protein security
- To improve the income of the farmers
- To produce high value aquarium fish for catering the global markets
- Production of organic vegetables/meat/eggs and fish from aquaponics and other integrated systems with premium value
- Improved production of specific resources like mussel, oysters etc
- Value addition of aquaculture products
- Better farm management and water quality management
- Better disease diagnostics and health management of cultivable fishes
- To promote cooperative movement in aquaculture to eliminate the middle men
- To improve capacity building and professionalism in the aquaculture sector
- Maintaining food safety of products and promote organic aquaculture
- Mangrove conservation and afforestation
- Ensure gender equality in the fisheries development
- Improved research and development in association with KUFOS.

CHAPTER 5.3
HIGHER EDUCATION SECTOR

Dr. P. R Sudhakaran

1. Introduction

It is customary to begin any narrative on education in Kerala with reference to its historic legacy. One can unfurl a long list: foreign exposure through its long coast line, its tolerant pluralism, its indigenous intellectual history, enlightened rulers and Christian missionaries and its radical politics of the modern times that prioritised demand for basic education as a dialectic response to the denial of the same for the discriminated, in the past. All this and more can be cited and analysed unendingly. This analysis, though illuminating, need not always to contribute action points for education sector of the current times. The realities of the current times and the context of education are very much different. Therefore, no attempt is made in that direction in this article.

Before any observations are made on the higher education sector in Kerala, it is required to take a quick look at the school education sector in the state. Kerala has made enviable progress in the school education sector. The Govt directly manages 16028 Schools, 169373 Teachers, 4542678 Students and 20297 Non Teaching Staff in general education sector. The enrolment is nearly 100% and dropout is nearly 0%. There is a school in accessible vicinity for almost every child. The biggest challenge in the school education is the transformed aspirations of the society. Dwindling population growth since last decade of the 20th century has created vacant seats in schools, automatically enhancing the choice. The general increase in affluence has led them to choose schools which are closer in looks and style to international schools which has been to the disadvantage of Govt schools. Govt schools which provide free education, excellent student support, which have qualified and motivated teachers (who have job security and are well paid) and which practice an arguably an excellent and modern education system in its pedagogic aspects, are seen as lacking in international ambience ! The Government has recently made an effective intervention to stem the desertion of Govt schools by raising the infrastructure of many to international standards. Thus, one can conclude that the school sector is basically in a healthy state, with achievements under its belt, and challenges clearly identified and intervention made. The same cannot be said about the Higher education sector in Kerala.

Kerala's higher education sector has been expanding in a roller-coaster manner, but as regards quality and excellence, it is nowhere near a world-class system, with exceptions of islands of excellence which are of no critical mass to provide any consolation. The issues plaguing the sector have not been clearly identified and/or recognised and therefore not

acted upon effectively by the political leadership of different times. An attempt is made here to sketch the present status of HEIs in Kerala and propose some of the focus areas for improvement.

2. Universities

Kerala got its first taste of University in second half of 19th century, from the University of Madras founded in 1857. Initially Keralites appeared for Matriculation, FA and BA examinations and soon a handful of colleges got affiliated to the University, including University College, Trivandrum and CMS College, Kottayam. In 1937, University of Travancore came into being and colleges in southern Kerala changed their affiliation to the new University. The University was modelled after British Universities and by today's norms, was not democratically constituted (Power sat above the University, with the Prime-minister/Dewan himself donning the position of Vice-Chancellor, though the person was a first rate scholar). The University College, Women's College and Engineering College became constituent Colleges of the University and research laboratories of the Govt such as Public Health Laboratory became University's laboratories. Research and Teaching stood separate. Research was centred around vaccine production, bio-chemical analysis, utilisation of natural products etc. The University teachers and students were not representative of the population, and teachers were almost entirely from the elite class. After formation of state of Kerala, University Act was modified. Renamed as University of Kerala, the organization of the University was made democratic. This act, in its core, is seen alive in all University acts that succeeded it.

Today the state has 16 Universities: 4 major multi-disciplinary Universities, 9 Single discipline Universities, one Open University and 2 National/Central Universities. Remarks on each of these groups are made below.

2.1 Multi-disciplinary Universities

University of Kerala (Est.....), University of Calicut (Est.....), Mahatma Gandhi University (Est.....), University of Kannur (Est.....) are the four multi-disciplinary Universities in Kerala. All the multi-disciplinary Universities have a common pattern. Their academic activities can be seen to have two sectors, (i) their own Departments/Schools of Studies and Research (University Campus) and (ii) Affiliated Colleges. Whereas the former is centred around direct management of Teaching, Research and Extension, the latter, as far as the University is concerned, is centred around management of examinations. More than 75% of the time, energy and human resources of the University are consumed by its affiliation function. As a result, the development of the University Departments are sub-optimal. World over, Universities are known for their own campuses. In recent times, accreditation agencies have cemented this focus. Universities in Kerala have started looking more at their campuses and realising that this

facet is in its infancy, as far as international standards are concerned. Instead of a detailed analysis a quick comparison with some of the best in the world would help in assessing the status of our multi-disciplinary Universities.

	Harward	Stanford	Oxford	JNU	Madras	Kerala	Calicut	MG	Kannur
Campus Area(Acr)	5100	8200	1300	1000		350	550	110	90
Library Books (lakhs)	180	90	110	5	5.25	8.5	1	0.6	0.4
Google Scholar Hits (lakhs)	2.6	2.6	1.3	0.17	0.35	0.11	0.06	0.03	0.11
Scopus Hits		7277			510	238	102	168	51
Patents Applied/granted per year		182		2		3	2	6	
International Ranking (THES)	7	4	1			800-1000 band		600-800 band	
Accreditation Score (NAAC)				3.77		3.03			
Research Papers	Around 7000/year					>400	>400	<400	>100
No of Depts in Campus		90				>40	>30	>20	>30
Students in UtyCmpus	20000	17000	20000	8000	5000	3000	3000	2000	2000
% of Int. Students	25	25	40	4		<2	<1	<1	<1
Faculty in Campus		2100			350	250	200	100	50
Nobel Laureates among faculty	Around 10-20			0					
Tuition fee as % of GDP(PPP)	19			0.1		0.1-13			
% of Women among students	40-50%					70-80			
% of Women among Faculty	25-35%					40-50%			
Research Publications on Covid						2			1

The above table obviously shows that multi-disciplinary Universities have miles to go before they can claim to be in the radar of international quality. In terms of faculty/student strength, international student presence, innovations and research impact, infrastructure, and finally, quality and excellence, they haven't reached their potential. At the same time, the democratic nature of their functioning, provision of freedom of speech, gender balance (except in top governance), student support, affordable fees and finally in social justice, the Universities of the state can claim stellar achievement. Only when quality and excellence is also achieved, these achievements can have real significance. A case to remember is that of the school system. Govt schools which are arguably superior to their alternatives in most of the important aspects of general education, have failed to be the obvious choice of all. In case of Universities, they are yet to claim superiority in academic aspects and threat looms large that in an environment where there are alternatives, they may face crisis. State Government cannot alone prevent this scenario as Central Govt may have different takes on opening up the education sector to private players and foreign universities. It is essential that a massive reform is initiated to take the Universities ahead, without resting on laurels. A number of initiatives may be considered in reforms of Universities, which are indicated below:

- **Professionalising management:** If Universities are to rise to international standards, their management will need to be professionalised. While retaining democratic functioning, the executive bodies of the Universities will have to include scholars of eminence. Politicians can sit on judgement on issues of social relevance such as reservation, fees, student support etc., but academic matters must be left to academicians alone.
- **Enhancing faculty/student diversity:** The faculty/student diversity in state Universities is alarmingly low. A large percentage of teachers are products of the same campus where they work and natives of Kerala. Among students, 80% is typically from the home district and the rest mostly from neighbouring districts and surely within the state. Outside state students and foreign students are typically less than 1%. It must be understood that a diverse campus is an important part of educational experience. Schemes to promote faculty/student diversity are an urgent need.
- **Enhancing student mobility:** Student mobility within the educational programme and between educational programmes are considered a basic right of students, internationally. Multiple entry and exit points need to be provided to students. Some Universities have enacted Credit-transfer Regulations, but they are yet to take main-stage. Joint programmes with Credit transfer between state Universities will make the system visible and then can be used internationally.
- **Examination Reforms:** Examinations are sort of goal-post for education systems. How carefully examinations are designed will decide the quality of the educational programmes. There is no serious study on quality of examinations in state Universities. A reasonable guess is that they are centred around lower-order thinking questions. This needs effective intervention.
- **Promoting innovation:** world-class Universities are also top-class innovators. New ideas and products emerge from campuses and some of them can trigger industries. Kerala University has vicinity of Technopark just like Stanford has Silicon Valley. But the comparison ends there. Innovation and start-up needs special attention in Universities. There are signs of initial activities in this area, but there are miles to go.
- **Visionary Planning & Infrastructure:** The campus areas of state Universities are dwindling, as the land unused is considered as surplus. Universities world over have sprawling campuses of which only a small percentage has occupation. The rest is an essential part of a campus, and stimulates free and creative thinking. Also Universities are perpetual institutions and their future expansion should not be compromised. Another matter of concern is the nature of infrastructure. Can't Kerala think of traditional and eco-friendly architecture rather than aping the west? Also, campuses need to consider providing on-campus accommodation for all.

2.2 Single-discipline Universities

The nine single discipline Universities in the state are: SreeSankaracharya University of Sanskrit (Est), ThunchathEzhuthachan Malayalam University (Est), Cochin University of Science and Technology (Est), Kerala Agricultural University (Est), Kerala Veterinary and Animal Science University (Est), Kerala University of Health and Allied Sciences (Est).

Kerala University of Fisheries and Ocean Studies (Est), APJ Abdul Kalam Kerala Technological University (Est), Kerala University of Digital Innovation (Est). The important question about these Universities is philosophical. Can they claim to be Universities, given that they have taken a fragmented piece of the knowledge-scape for their exclusive attention? Out of the nine, only two are focused on arts. This is in tune with the public perception of superiority of Science, Technology & Medicine. CUSAT has a small presence of non-science in it. It works in line with other state Universities. It has no provision to affiliate, but it has in effect affiliated many institutions in the past (which have later been transferred to KTU). Kerala Agricultural University has given birth to Kerala Veterinary and Animal Science University and Kerala University of Fisheries and Ocean Studies. Kerala University of Health and Allied Sciences and APJ Abdul Kalam Kerala Technological University are both, Universities weighed down by affiliation of medical institutions and engineering colleges respectively. Both have no Departments and Faculties of its own. Kerala University of Health and Allied Sciences is also a rare case of a University with knowledge domains that do not approve of each other (Allopathy Versus Ayurveda/Homeopathy). The newly established Kerala University of Digital Innovation (is yet to carve out its niche).

The future of the single-discipline Universities is closely related to the National Education Policy 2020, which mandates all Universities to become multi-discipline. It is not clear how and how forcefully the policy will be acted upon. If the policy gets translated in full, single-discipline Universities may have to recast themselves in the near future.

2.3 Open University

The newly established Sree Narayana Guru Open University of Kerala is expected to give a fillip to distance education. Other Universities have been running distance education programmes in the past. No stock-taking of their quality is available, but there is no sign of international quality in any case. The new University, it is hoped, will re-script the scenario. With online educational experience gained by the society during Covid lockdown period, the University will find it easy to use technology to deliver courses. Internationally suitable quality of content will be the challenge of the University.

2.4 National/Central Universities

National University of Advanced Legal Studies (NUALS) established in 2005 and a Central University, Kasaragod are also functioning in the State. The former is a very small

single-discipline University whereas the later has been developing to a national campus. The Central University has above 100 full-time faculty members, with 27 Departments and 11 schools, and close to 3000 students in campus. The campus has excellent diversity, about 40% of teachers and students are from outside the state. Another noteworthy feature is that, perhaps due to remoteness and outside-state teacher/student presence, the campus provides accommodation for almost all faculty and students inside the campus, something that state Universities have not achieved so far.

3. Arts and Science Colleges

There are 229 arts and science colleges in the State comprising of 163 private aided colleges and 66 government colleges. Apart from these, there are un-aided/self-financing arts and science colleges. Total number of students enrolled in various arts and science colleges (excluding unaided colleges) under the four general universities in Kerala during 2018-19 is 2.96 lakh. Nearly 69% are women.

Programme	Student Numbers	% of Women
B. A.	133235	64.6
B.Sc.	103234	75
B.Com.	45624	63.6
Total	282093	68.3
M.A.	15461	65.2
MSc.	19133	65.7
M.Com	6465	70.3
Total	41059	66.2
Grand Total	323152	68.0

Programme –wise Enrolment of Students in Arts and Science Colleges

Source: Directorate of Collegiate Education

For first degree programmes, 47% are enrolled for B.A, 37% for BSc and 16% for B.Com degree courses, showing that humanities has double the numbers of science. 27 subjects are offered for BA degree programmes. Among the subjects, English followed by Economics has the largest number of enrolment of students. 31 subjects are offered for BSc programmes and Physics followed by Mathematics has the largest number of student enrolment. 38895 students are admitted to post graduate programmes in the State in 2018-19, of which 66% are women.

The enrolment of Scheduled Caste (SC) students at degree and post graduate level in the is nearly 13% and ST is slightly above 2%. These compare well with the population percentage of SC & ST in Kerala which are and% respectively.

Table 2 *Percentage of SC/ST students in higher education*

Course	Total	% of SC	% of ST
B. A.	133235	10.6	2.5
B.Sc.	103234	15.4	1.0
B.Com.	45624	13.4	1.8
<i>Total</i>	<i>282093</i>	<i>12.8</i>	<i>1.8</i>
M.A.	15461	15.6	5.8
MSc.	19133	11.4	3.2
M.Com	6465	13.4	4.4
<i>Total</i>	<i>41059</i>	<i>13.3</i>	<i>4.4</i>
Grand Total	323152	12.9	2.2

Source: Directorate of Collegiate Education

<<DETAILS of schemes for SC/ST>.....TO BE ADDED

Central and State sector scholarships of 13 types are given to students. Various scholarships including post metric scholarships (63718), District Merit Scholarship (20423), Kerala State Suvarna Jubilee Scholarship (4500) and Central Sector Scholarships (7218) were given in 2018-19.

The number of teachers in arts and science colleges in the State are over 10,000 with nearly 57% women. 36% of teachers in arts and science colleges in the State have Ph.D degree. About 3000 Guest Lecturers were working in arts and science colleges of the State during 2015-19.

<<<<< DETAILS OF SELF FINANCING COLLEGES>>>>

A number of issues and areas for intervention in arts and science colleges are indicated below.

- Rigid framework of educational programmes prevent international formats of programmes. At the core of this is the system of work-load and lecture-hours. Each discipline fights for status quo of their workload and this becomes a road block for all educational reforms. Accomodation of status-quo in work-load and very traditional arguments of who can and cannot teach each subject are potent enough to derail any academic reform. Then there are archaic system of recognition & equivalence. In case of admissions, cant we admit students from any background provided they write a admission test that tests their skills in the required area ?

- Credit and semester system, the standard academic system widely popular internationally, has got settled in colleges in last two decades. PG programmes adopted it in early years of 2000-2010, while the UG system adopted it in later years of the same decade. Both have brought in changes, but not all positive. New nomenclature has percolated into the system, but philosophical adoption is incomplete as yet. Teachers with mind set on old year system keep complaining that there is no time to teach and it is exams all around. There are 90 working days required in a semester, but it is not religiously adhered to. Teachers need to be motivated to accept the system in toto. If world-class institutions can run a 4-credit course in 3 months (like in US), it is possible lack of adaption that makes our teachers complain.

- Student politics in campuses has to be addressed in two ways. *Peaceful* campus politics is a constitutional right. Recently, Govt of Kerala said in an affidavit before the High Court that “*Peaceful protests of students, teachers and other employees of the institutions in the campuses cannot be barred and the campuses shall be free and open for democratic protests, dialogues and discussions in a peaceful manner*”. The Government spoke rightly and did not forget to add the word *peaceful*. Campus politics prepare students for the larger world, to form opinion on how our world should be, through debates, arguments, actions and reactions. Students Unions or student governance is aimed at exposing students to democratic politics. However fascist and violent student politics as well as banning of politics are both bane of the campuses. As some campuses witness violent deaths of students, some new generation institutions run campuses like a military camp. Political leadership has to ensure that campus politics is permitted in every campus, but does not show fascist tendencies and does not affect educational activity.

- Govt and Aided Colleges have an established system of appointment of teachers and their their promotions. In addition to salaries of teachers in Govt Colleges, Govt also pays salaries of teachers in aided colleges, through the Direct-Payment agreement with managements, in return for student admission according to Govt norms. Most managements are well known to be corrupt in appointment of teachers, taking hefty sums as donations. In addition to the issue of corruption, the practice has an effect on eroding ethical strength of teachers. Even meritorious teachers have to compromise with the dishonourable practice to secure a permanent position. There have been tentative discussions on making appointments to aided colleges through PSC, but it has never been given serious consideration, given clout of corporate managements. This issue will have to be taken up head on, by the political leadership.

- Self-financing colleges which have mushroomed in great numbers in recent times, present many new concerns. Their teacher appointments, salaries, promotions etc are left out of any control or even monitoring of Universities or Government (Accreditation

agencies do conduct a coarse monitoring). The fixing of fees is an annual crisis, with Managements using legal and organizational means to bargain. It is hightime that the Govt sets up a teacher bank or a teacher recruitment board from which the colleges may be provided with teachers. Intervention on ensuring fair wages is also called for.

- Around 25% of teacher strength are already teachers on short-term contracts (Guest Lecturers, in common parlance, though many remain in campus during working time, like regular teachers). In recent times their wages have been enhanced to reasonable levels in Govt/Aided colleges, but as the short-contract teachers increase in numbers, unless their appointments and terms of service are regulated, we may see unexpected results. A teacher recruitment board is essential to regulate appointments.

- Curriculum design by the Universities has recently gone through some arguable improvements. From telegraphic statement of topics, Outcome based syllabus design has been widely adopted. Learning Outcome based Curricular Framework (LOCF, as UGC has christened it), involves designing syllabus, teaching strategies, assignments and examinations with focus on *what students can do after course completion*. Many existing syllabus ornamentally state *Aims and Objectives*, which are often *teaching objectives*. LOCF is student/learning centric and states explicit *learning outcomes* that are measurable, specific, achievable, realistic & time bound. *It brings great clarity to students on how/what to learn, to expect in exams and for the Teacher, on how/what to teach and test*. As of now, most syllabus have been reformatted with stating outcomes, but this is only a part of LOCF. As one writes specific outcomes, one may realise that the syllabus topics need to be rewritten. Outcomes and syllabus will have to be tightly coupled with each other. Thereafter teaching will have to be tuned to addressing outcomes. Redesigning assessment is finally a major part of the transformation. As of now, there is no indication that the succeeding part of this important educational reforms are being taken up.

- Examination Reforms mentioned in the case of Universities is applicable to examinations for Colleges. 25- 40% of assessment is internal and the examinations for the same also need to reform.

4.1 Engineering Colleges

There are 179 engineering colleges in the State with a sanctioned intake of 51764 in 2019. Out of these engineering colleges about 93% are self-financing colleges (unaided), 5% are government colleges and 1.7 % are private aided colleges. The self-financing sector has the lion's share of seats (government colleges= 6.5%, aided colleges = 3.6% and unaided colleges =89.9 %). The quality of education cannot be ascertained by measuring any single parameter, but pass percentage is definitely a major one. In this aspect, public institutions rate considerably high above private self-financing colleges. The overall expansion in seats available, unthoughtful geographic distribution of colleges (in remote areas and also close to competing colleges) and wavering public perception of engineering profession has badly affected the self-financing colleges many of which have no heritage or uniqueness to attract good students. Another interesting fact is that the gender-wise performance is very skewed While pass percentage for men is 50%, women have 86%.

Table B. Tech Result, 2019

Type	Pass Percentage
Government	73.5
Private Aided	75.8
Govt Autonomous	65.1

Private Self Financing	63.4
Total	65.3

Source: Kerala Technological University, 2019

Engineering and medical education continue to be important means of ascending the social ladder, but the pass percentage of SC/ST students (36% and 44.6% respectively) is far below the State average.

Table *Pass percentage of SC/ST B.Tech students, 2019*

Management	SC		ST	
		Pass Percentage		Pass Percentage
Government		37.7		55.6
Private Aided		56.7		53.9
Govt-Autonomous		29.4		50.0
Private Self Financing		32.16		26.1
Total		36.0		44.6

Source: Kerala Technological University, 2019

Research in Engineering Colleges has been given a new thrust with 32 research centres under KTU with 600 recognized guides and about 600 research scholars.

4.2 Polytechnics and Technical High Schools

There are 45 government polytechnics and 6 private aided polytechnics in Kerala. The annual intake of students in government polytechnics and private aided polytechnics during 2019-20 are 10644 and 1422 respectively. Student intake is highest in the trade of Computer Engineering (2020) followed by Electronics Engineering (2010), Mechanical Engineering (1670) and Civil Engineering (1340). Women constitute 28.3 per cent of the total strength in polytechnics. Total number of teachers working in polytechnics of the State is 1512, with 38% women. Thirty nine Government technical high schools are functioning in the State. Total number of students in technical high schools in the year 2019-20 is 7843, and 582 teachers are working in technical high schools during this period.

5. Managment of Higher Education

5.1 Kerala State Higher Education Council

By recognizing the importance of state-level planning and co-ordination for the effective implementation of national level policies in higher education, the National Policy on Education, 1986 suggested that State Council of Higher Education should be set up in all states. Accordingly, Kerala State Higher Education Council came into existence in 2007. The Council is the principal higher education policy input provider of the State and it strives to bring about equity, access and excellence in higher education sector. The major responsibilities of the Council are:

- Act as an agency for formulating higher education policies of the State
- Render advice to the government, universities and other institutions of higher education in the State
- Co-ordinate the activities of various agencies of higher education in the State
- Initiate new concepts and programmes in higher education
- Provide common facilities in higher education without impinging upon the autonomy of other institutions of higher education

The major activities and achievements of the Council over the periods can be summed up as:

- Restructuring of Under Graduate Education (Introduction of Choice Based Credit and Semester System)
- Implementation of Higher Education Scholarship Scheme for the meritorious students in Arts and Science Colleges
- Implementation of Erudite Scheme (Scheme formulated to arrange opportunity to the students and teachers of the State to interact with internationally renowned academicians and Nobel Laureates)
- Publication of the journal, *Higher Education for the Future*
- Preparation and submission of reports on various issues pertaining to higher education sector

5.2 RashtriyaUchathaarShikshaAbhiyan (RUSA)

The key objective of RUSA is to improve access, equity and quality in higher education through planned development of higher education at the state level. Objectives include creating new academic institutions, expanding and upgrading the existing ones, developing institutions that are sel-reliant in terms of quality education, professionally managed, and characterized by greater inclination towards research and provide students with education that is relevant to them as well nation as whole.

Under RUSA I, an amount of Rs.170 crore was approved and out of this, Rs.146.97 crore was released in total. Rs. 88.1 crore was released as Central share and corresponding State share was Rs.58.7 crore. As part of this first phase of RUSA, infrastructure grant to 6 universities and 26 colleges, faculty improvement and equity initiatives were approved.

Under RUSA II, an amount of Rs.355 crore has been approved out of which Rs.138.4 crore was released in total. Of this, Central share of Rs. 93.8 crore and corresponding State share of Rs.82.5 crore have been released so far. A RUSA model degree college, 6 Autonomous colleges, 112 colleges for infrastructure grants and 2 universities for Research, Innovation and Quality improvement have also been approved under the same.

. *College Quality Improvement Programme:* CQIP is implemented to help Colleges that have not earned the NAAC rating to upgrade its standards of quality.

Additional Skill Acquisition Programme: The additional Skill Acquisition Programme focuses on enhancing chances for securing employment for the segment of students studying in Higher Secondary and Undergraduate Courses.

*Scholar Support Programme:*The proposed programme envisages to extend support to scholars in the Under Graduate programme with timely assistance in terms of tutorials, additional lectures, interactive sessions, question banks and study material.

*Walk with a Scholar:*Under this scheme, specialized mentoring programmes are arranged for students in the Undergraduate Courses in the Arts, Science and Commerce streams, to nurture promising and willing students and to provide guidance for their future.

Fostering Linkages for Academic Innovation and Research (FLAIR): The major objective of the programme is to motivate and encourage the potential, talent and capabilities of the newly recruited teachers in Colleges to be tapped and fully utilized for the betterment of the institution in particular and the society at large.

CHAPTER 5.4

FINANCIAL INSTITUTIONS AND INNOVATIONS

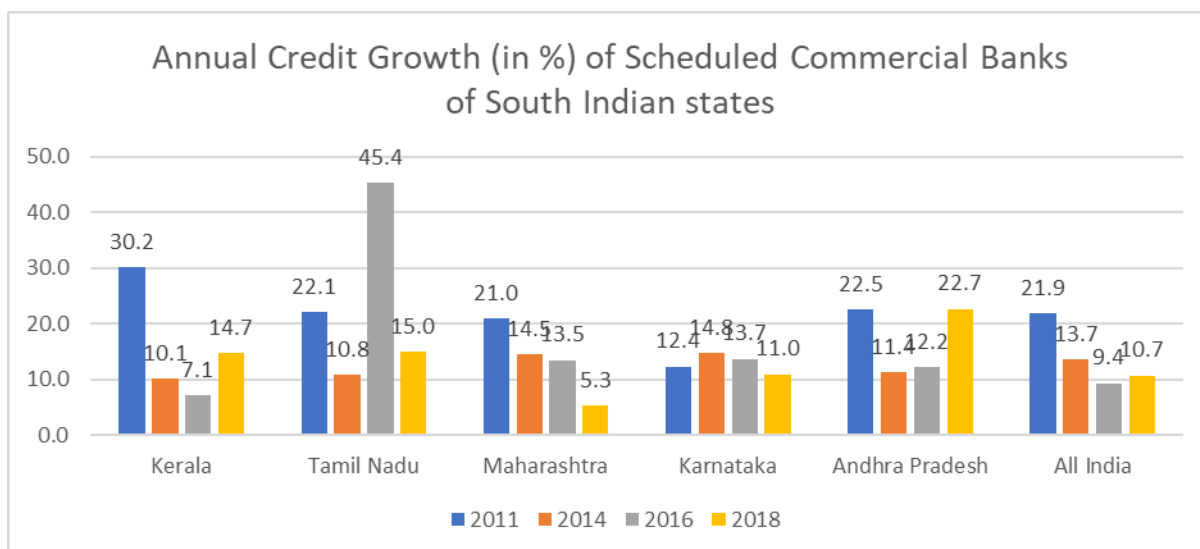
Kerala is one of the leading states in terms of inclusive banking system. As on March 2020, banking sector in Kerala comprised 6584 branches, which includes commercial Banks, RRBs and small financial banks with ₹544371.82 crore of deposits and ₹359273.74 crore of advances. Besides, there are 992 co-operative banks with ₹ 64687.31 crore deposits and ₹50333.91 crore advances. Out of the total bank branches in the state, the public sector commercial banks dominate with 44.86 per cent, private sector commercial banks constitute 30.62 per cent, co-operative banks 13.09 per cent, regional rural banks 8.37 per cent and small finance banks with 3.06 per cent. The density of banks indicates that there is one branch for every 5089 persons and one ATM for every 3688 persons. Regarding the geographical coverage, 65.11 per cent of the branches are in semi-urban areas, and 23.21 per cent of the branches are in urban areas. Only 11.68 per cent of the total bank branches are in rural areas. Despite the fact that the banking industry in the State caters to the priority sector and is always higher than the statutory level of 40 per cent of total advances, credit delivery is yet to reach to all section of borrowers like farmers, small entrepreneurs, unemployed youth and return emigrants. Credit delivery assumes greater significance in times of crisis and adverse policy measures of the Centre such as demonetization and improper implementation of GST.

6.3.1 Deposits and Advances – An Overview

The total bank deposits in Kerala as on March 2020 was ₹609059.13 crore. Out of the total deposits, the share of public sector banks is 46.7 per cent, private sector banks 38.38 per cent, Co-operative Banks 10.62 per cent, RRBs 3.16 per cent and Small Finance Banks 1.14 per cent. As compared to southern states, the volume of deposits in Kerala is smaller, as the economic activities of the state are comparatively less. The contribution of Non-Resident Keralites is crucial, as deposits in NRK accounts constitute 34.27 % of total deposits of the banking industry. The Covid-19 pandemic has led to large-scale return of migrants. This has resulted in an increase in NRIK deposits. Total NRK deposits increased from ₹1,99,781 crore in December 2019 to ₹2,08,698 crore in March 2020. Lower interest rate in global banking sector is also one of the reasons for increase in NRK deposits over last five months. Private sector commercial banks have the major share of the NRI deposits with 51.34 per cent, public sector banks with 47.31 per cent, 0.72 per cent with RRBs and 0.63 per cent with Small Finance Banks. The amount of NRI deposits in Co-operative banks are very small (₹ 3 lakh).

Annual credit growth of the state has improved from 10.1 per cent in 2014 to 14.7 per cent in 2018. State-wise analysis of the southern region of the country shows that Andhra Pradesh and Tamil Nadu always lead in terms of credit delivery. Figure 1.1 shows the trend of credit growth among the southern states in the country.

Figure 1.1



Source: Handbook of Statistics on Indian Economy, 2018-19, RBI

Priority sector lending in the State is 52 per cent of total advances in March, 2020 as against the statutory norm of 40 per cent. Bank wise analysis shows that cooperative banks are the leading division in maintaining priority sector lending for essential areas like agriculture, Micro Small and Medium Enterprises (MSMEs) and education. Out of the total advances, the cooperative sector provided 68 per cent for priority sector as on March 2020, followed by public sector banks with 57 per cent. It is to be noted that private sector ensures only 39 per cent of their entire advances to priority sector. However, RRBs provide 94 per cent of advances to priority sector. Table 1.1 shows the details of priority sector lending of banks in Kerala.

Priority Sector lending as a % to total advances in Kerala																
Year	Agriculture Sector				MSME				Other Priority Sector				Total Priority Sector			
	Public Sector Banks	Private Sector Banks	Co-operative Banks	Total Banking Sector	Public Sector Banks	Private Sector Banks	Co-operative Banks	Total Banking Sector	Public Sector Banks	Private Sector Banks	Co-operative Banks	Total Banking Sector	Public Sector Banks	Private Sector Banks	Co-operative Banks	Total Banking Sector
2016	27	18	16	23	17	17	3	15	21	7	49	21	65	42	68	58
2017	27	19	18	23	14	18	2	14	21	6	43	20	62	43	63	57
2018	28	18	15	23	15	19	3	15	26	5	44	21	69	41	62	59
2019	29	18	17	24	15	19	3	15	16	5	47	16	59	42	67	54
2020	27	16	14	22	14	18	9	15	15	5	45	15	57	39	68	52

Source: State Level Bankers Committee, Kerala

Note: Status of the year is as on the month of March in each year

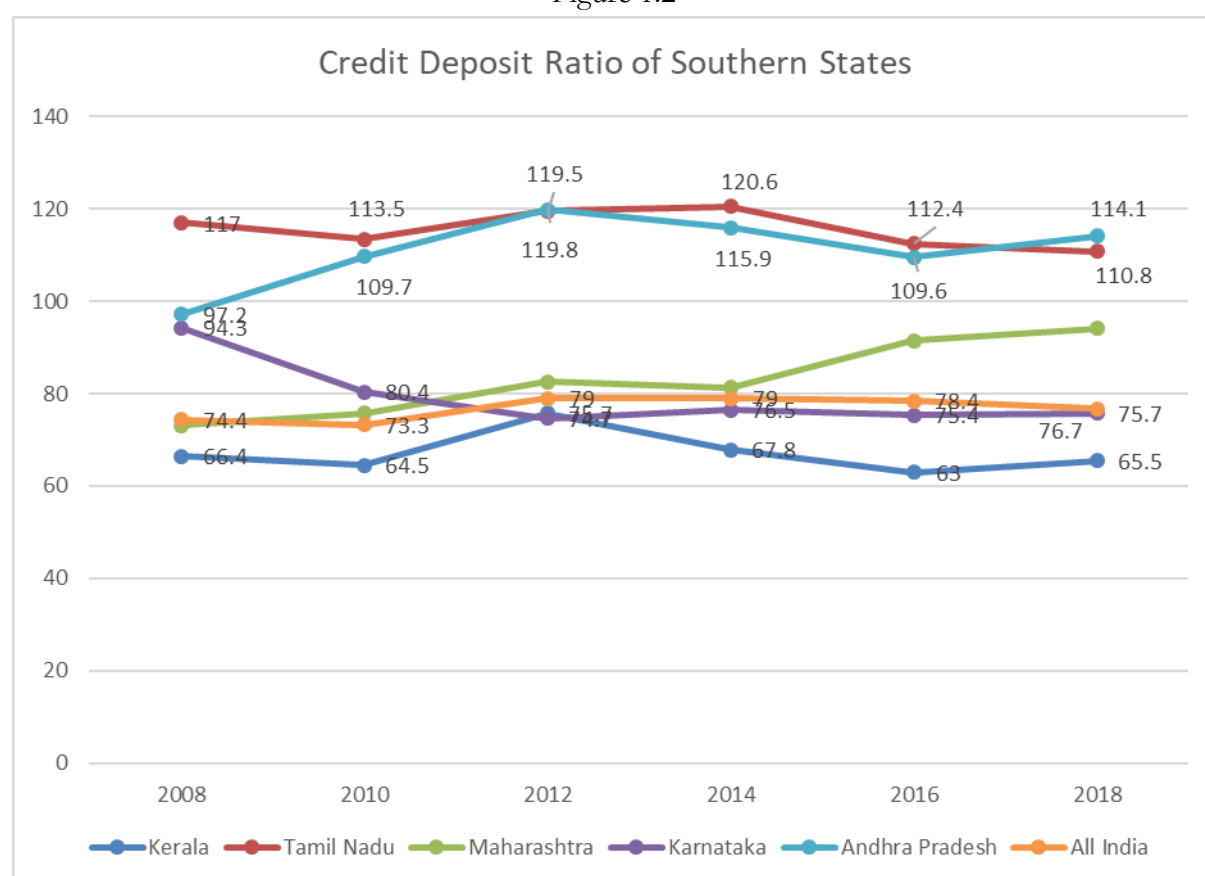
As per the lending target of RBI, out of the total priority sector lending, 18 per cent should be for the agriculture sector. However, in Kerala, it is more than 20 per cent. Micro Small and Medium Enterprises constitute another critical area where credit is indispensable. Among

priority sector lending, it constitutes around 15 per cent. Private sector banks have a predominant role in this area. Cooperative banks mainly focus on lending to construction activities and advances to education and weaker sections.

6.3.2 Credit Deposit Ratio

Kerala has a low credit deposit ratio (CD ratio) among Indian states. The CD ratio in Kerala as on March 2020 is 67.25. While analyzing the data, we can see that deposits, particularly Non-Resident contributions, have not been potentially distributed within the state. Similarly, the CD ratio of neighboring states is much higher than Kerala. In Andhra Pradesh, the CD ratio is 114 and in Tamil Nadu it is at 110. Intra-state analysis reveals that CD ratio varies significantly from district to district. The CD ratio is as high as 134 in Idukki and 133.73 in Wayanad, whereas it is 27.04 in Pathanamthitta. The credit deposit rates of southern states are given in the Figure 1.2.

Figure 1.2



Source: Handbook of Statistics on Indian Economy, 2018-19, RBI

Bank-wise analysis reveals that among the banks, CD ratio is more than the state average in cooperative banks and public sector banks, at 77.81 and 69.03 respectively. The CD ratio in private sector banks is always less than the state average, which indicates the low liquidity stimulations through private sector banks in the state economy. Table 1.2 shows bank-wise CD trend in the state for the period March 2016 to March 2020.

Table 1.2
CD Ratio of Different Banks

Year	Public Sector Banks	Private Sector Banks	Co-operative Banks	Total Banking Sector
2016	66.97	59.72	61.58	63.89
2017	64.93	58.18	65.52	62.81
2018	65.23	63.05	68.53	64.72
2019	69.03	63.82	72.31	67.52
2020	70.27	60.67	77.81	67.25

Source: State Level Bankers Committee, various years reports

The level of loan disbursement by banks is an important indication of economic activity. Low level of CD ratio is one of the reasons for low investment level in the State. In order to enhance CD ratio, appropriate strategies should be evolved.

6.3.3 Differential Rate of Interest (DRI)

In 1972, the Government of India had formulated a scheme for extending financial assistance at concessional rate of interest of 4% to selected low income groups for productive endeavours initially by public sector banks and then by private sector banks also. The scheme known as Differential Rate of Interest Scheme (DRI) is now being implemented by all Scheduled Commercial Banks in the country. It is a programme to ensure credit facilities to the marginalised and poor at affordable rates. This provision is also a part of priority sector lending to the weaker sections. Accordingly, public sector banks have to ensure 1 % of their previous year advances to socially disadvantaged groups with differential rate of interest. Unfortunately, nationalised banks in Kerala have not been able to reach its targets. Kerala is maintaining very low levels of advances under the provision of DRI and the level is declining year on year. For instance, in 2017, public sector banks in Kerala had delivered ₹ 2066.23 lakh, which was only 0.03 % of the previous year's total advances of public sector banks. The non-delivered amount for the same year is ₹74,327.49 lakh and it has been increasing year on year. The banking system in the state needs to take into account the poor performance in this regard. Table 1.3 shows the trend of credit delivery under DRI provision in nationalised banks in the State.

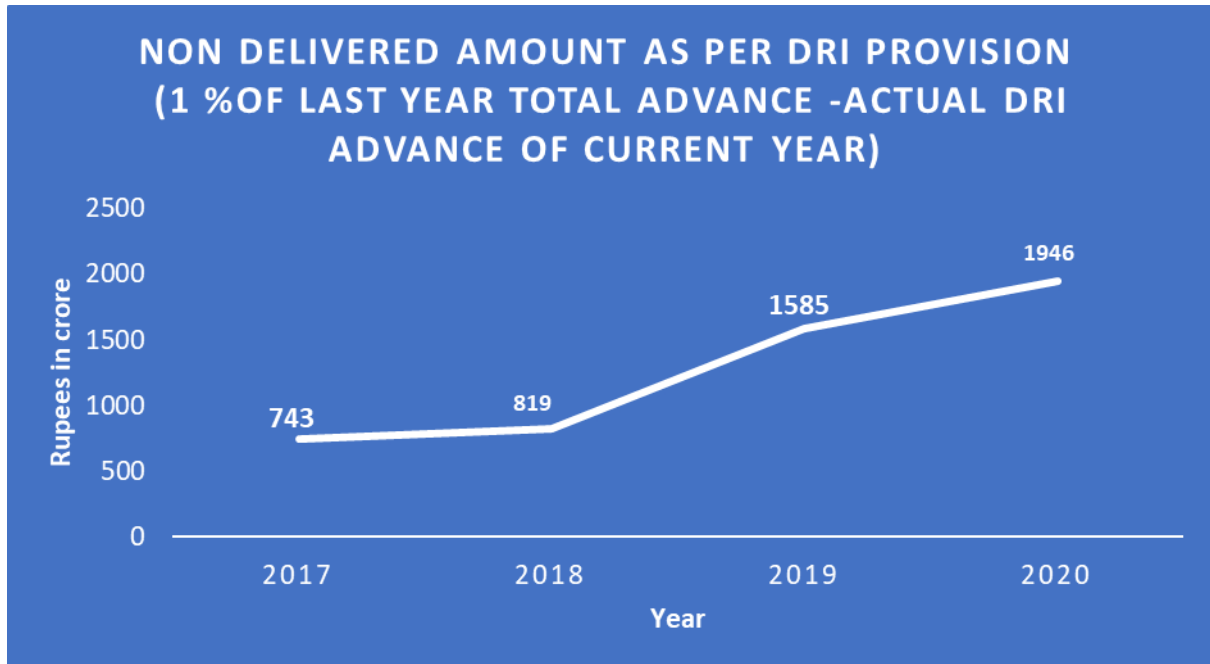
Table 1.3

Rs in lakh

Year	DRI Advance of Nationalised Banks	Total Advance of Previous Year	% of DRI Advance to last year Advance	Non delivered amount as per DRI provision (1 %of last year total advance - actual DRI advance of current year)
2017	2066.73	7639422	0.027053	74327.49
2018	2033.99	8388607	0.024247	81852.08
2019	2055	16056167	0.012799	158506.67
2020	1334	19592838	0.006809	194594.38

Source: Compilation of data from reports of SLBC on various year.

Figure 1.3



Source: Compilation of data from reports of SLBC on various year.

6.3.4 Non-Performing Assets

Non-Performing Assets (NPAs) is defined as a loan or advance where the provision or interest payment remains overdue for a period of 90 days. An alarming increase of NPAs (8.5 % in March, 2020) is the major challenge to Indian banking industry. Normally, NPAs in Kerala is less

than national average. After the implementation of demonetization and GST, NPAs showed an upward trend. The Covid-19 pandemic has added to the financial stress in the economy. This may further add to the NPAs in the banking system.

Table 1.4
Non-Performing Assets (NPAs) of Banking Sector in Kerala (in %)

Year	Public Sector Commercial Banks	Regional Rural Banks	Private Sector Banks	Co-operative Banks	Total Banking Sector
2016	5	3	2	NA	3
2017	6	3	3	5	4
2018	4	3	3	3	4
2019	4	3	3	9	9
2020	4	5	4	10	5

Source: SLBC, Kerala, from report of various year

Among the banks, a change in the level of NPAs is seen in Regional Rural Banks and Cooperative Banks. Since these banks meet most of the credit needs of the rural economy. The increasing trend of NPAs shows that business turnover in the rural sector is not remunerative.

6.3.5 Cooperative Banks

Cooperative banks in Kerala have been playing a central role in providing rural credit to agriculture and other informal sector activities. Cooperative banks are a significant part of Kerala's development process. As on March, 2020 there were 992 Co-operative Bank branches in Kerala with ₹ 64,687.31 crore deposits and ₹50,333.91 crore advances. Cooperative banks lead in terms of priority sector lending in the State. The priority sector lending by cooperative banks is 68 per cent as against the 52 per cent of total banking sector in the state. Similarly, credit-deposit ratio of the cooperative sector is 77.81 per cent as against the 67.25 per cent of total banking sector in Kerala. Most people, particularly those engaged in the informal sectors and the agriculture farm sector have failed to receive timely credit from public sector or private sector banks. In these situations, cooperative banks have been functioning as their last resort. The timely repayment of borrowed money has helped these banks to expand their branches in the state.

6.3.5 Kerala Bank

Currently, financial institutions have been undergoing various structural changes in the country. These include reduction in the number of bank branches, merger of banks, privatisation and the entry of foreign investment into domestic banks, and so on. In this context, considering the strength of cooperative banks in Kerala, the State Government has adopted a policy of

converting the present three-tier cooperative structure viz: Kerala State Cooperative Bank (KSCB), District Central Cooperative Banks (DCCBS) and Primary Agricultural Credit Societies (PACS) into a two-tier structure. The Reserve Bank of India had conveyed its consent for the amalgamation of 13 District Co-operative Banks with Kerala State Co-operative Bank. Kerala Bank is the first scheduled Cooperative bank in the country. The government hopes to build on the legacy of the cooperative credit movement in the state, particularly in the rural economy.

6.3.6 Non-Banking Financial Institutions/ Companies

Non-banking financial companies (NBFCs) are entities or institutions that provide certain bank-like and financial services, but do not hold a banking license. NBFCs are not subject to banking regulations and oversight by central and state authorities that traditional banks must comply with. Investment banks, mortgage lenders, money market funds, insurance companies, hedge funds and private equity funds are examples of NBFCs. These organisations play a crucial role in the economy, offering their services in urban as well as rural areas, mostly granting loans allowing for growth of new ventures. NBFCs also provide a wide range of monetary advices like chit-reserves and advances. In Kerala, more than 175 NBFCs operate at various stages and their role is noteworthy in terms of stimulating the economy.

6.3.7 Kerala State Financial Enterprise (KSFE)

The Kerala State Financial Enterprise (KSFE), a fully owned Government Miscellaneous Non-Banking Finance Company (MNBC), was incorporated in 1969 primarily with the objective of safeguarding interest of the general public by protecting them from fly-by-night operators, along with bringing about order and discipline in the chit fund industry, thereby providing a safe and secure alternative to investors, and promoting the chit industry in an organised manner. A significant volume of financial transactions is circulating through KSFE with total deposits of ₹ 12,548 crore and total advances of ₹5705 crore as on March 2019. Chit funds are one of the most appropriate financial instruments for mobilising household savings for the purpose of capital formation. Total chit fund as on March 2019 is ₹ 1817 crore. KSFE also facilitates Non-Resident Keralites investment into the state. Recently the Pravasi Chitty was introduced to attract investment into state infrastructure development through KIIFB. Pravasi Chitty was initially launched in UAE and further extended to Emirates/Gulf Cooperation Council (GCC) countries.

6.3.8 Kerala Financial Corporation (KFC)

Kerala Financial Corporation (KFC), incorporated under the State Financial Corporations Act of 1951, plays a major role in the development and industrialisation of Kerala. Now KFC has 16 Branch Offices with its Head Quarters at Thiruvananthapuram and Zonal Offices at Kozhikode, Ernakulam and Thiruvananthapuram. The Corporation is the first PSU in Kerala and first SFC in India to initiate Corporate Social Responsibility activity. As part of its Corporate Social Responsibility, KFC has set up KFC-CARE (Centre for Assistance and Rehabilitation) to rehabilitate and serve the marginalized sections of the community.

6.3.9 WAY FORWARD

Fundamentally, a strong network of financial institutions is inevitable for efficient allocation of economic resources. Despite having a structured banking system, Kerala has not succeeded in directing the savings of the economy particularly those of Non Resident Keralites to productive activities. Low Credit-Deposit ratio particularly in private sector banks and increase in non-delivered credit under Differential Rate of Interest to weaker section is a matter of serious concern.

It is a well-known fact that NRI deposits constitute around 35 percent of Kerala's total bank deposits. Apart from deposits, the remittances received by the State have a significant influence on the functioning of the domestic economy especially in retail and construction sectors. Due to the pandemic, many countries have initiated or are about to start austerity measures. Consequently, there has been a considerable inflow of return emigrants from various countries. Around 4.81 lakh emigrants have returned to Kerala during January to August 2020. Of this number, 56 per cent have lost their jobs. As the banking sector of the State is highly dependent on Non-Resident deposits, the inflow will adversely affect the banking industry.

Emigration is an indispensable fuel for the state's economy. The potential challenges before the State Government are rehabilitation of return emigrants, re-integration of return emigrants into the domestic labour market, and re-emigration of these return emigrants into hosting countries. Financial institutions may possibly play a proactive role for ensuring all these activities in the State. More emphasis is needed on delivering of credit for rehabilitation of return migrants, providing incentives to skilling and up-skilling of return emigrants and credit provisions to the potential emigrants for seeking better employment opportunities. A joint effort on the part of Government and bankers is essential for attaining financial inclusion in the State.

CHAPTER 5.5
COOPERATIVES IN KERALA:
THE MOVEMENT, POSITIONING AND THE WAY FORWARD

I
INTRODUCTION

The cooperative sector in India traces its origins to the Cooperative Credit Societies Act of 1904 and the Cooperative Societies Act of 1912, both enacted by the British government. These laws were a major landmark in the history of the cooperative movement as they inaugurated the era of state-sponsored cooperative societies.

The evolution of cooperative policies and legislations at the national and state level had a major impact on the growth and performance of the cooperative sector in Kerala. This was especially so as cooperatives became a provincial state subject after the enactment of the Government of India Act of 1919. States started formulating their own cooperative laws.

In the case of Kerala, the growth of the cooperative sector, especially in the northern parts of the State, was intertwined with the activities of the social reformers and left mass movements.

The Travancore Cochin Cooperative Societies Act of 1951 came into force bringing together the pre-Independence laws in the states of Travancore, Cochin and Malabar. The Kerala Cooperative Societies Act of 1969 emerged from the former. Cooperatives, which brought together employees, workers, farmers, fishermen, small producers and other groups into organized self-reliant groups, were influenced by the social and political factors during that period.

Some of the first trade unions like the Sree Narayana Beedi Thozhilali Union in Tellicherry mooted the idea of beedi cooperatives to ensure higher wages and better working conditions for the workers in 1934. The Kerala Dinesh Beedi Cooperatives, which at its peak gave employment to more than 25,000 workers with much higher wages and non-wage benefits in the districts of Kannur, Kasaragod and parts of Kozhikode, is an outstanding example of a successful cooperative.

An outstanding example of the success of cooperation is the Uralungal Ikea Nanaya Sangham in Kozhikode district that was registered in 1922. Today it is the Uralungal Labour Contract Cooperative Society (ULCCS). ULCCS is one of the largest construction cooperatives in Asia diversifying into information technology parks and even a special economic zone. The ULCCS was an outcome of the innovative ideas propagated by the social reformer Vagbhatananda.

Earlier, these societies were registered with 'unlimited' liability. But the recovery of loans became a problem and a number of societies were liquidated because of excess liability over assets. Thus, the liability of the societies was changed to 'limited' from 1918 onwards. The Land Mortgage Bank was formed in 1932 to provide long-term loans. The Cochin Co-operative Societies Act was enacted in 1913. The first co-operative society registered under this Act was 'Advanced Co-operative Society'.

Unlike the experience of the cooperatives in northern Kerala, those in central and southern Kerala were the beneficiaries of the policies of the Travancore and Cochin princely states. The first cooperative that was registered after the passage of the Travancore Cooperative Societies Regulation Act of 1914 was the Travancore Central Cooperative Bank, which was later transformed into the Kerala State Cooperative Bank. In fact, the first cooperative legislation in Travancore, the Travancore Cooperative Societies Regulation Act of 1914 had a sympathetic attitude to encouraging the funding of cooperatives.

The 13th Five-Year Plan document indicates that “the development of co-operative credit institutions was the key to the historical weakening of usury in rural areas of the State”. As the Report of the Committee on the impact of demonetisation appointed by the State Planning Board observes, “Cooperation and primary cooperatives are Kerala’s strength, a rich legacy of our freedom movement. People’s confidence in these institutions is part of Kerala’s historical heritage.” Today, these institutions form the backbone of much of rural economic activity in the State.

Cooperatives in Kerala operate under the jurisdiction of different departments of the government. The largest and the most significant segment is the cooperatives that come under the administrative control of the Registrar of Cooperative Societies (RCS) in the Department of Cooperation. It includes apex cooperatives, federal cooperatives, district cooperative banks, credit cooperatives, consumer/school/college cooperatives, marketing and processing cooperatives and others. Together, there were around 15,761 cooperatives in 2019.

In addition to these cooperatives, there are also around 6000 cooperatives that operate under the jurisdiction of other departments of the government. They include 604 khadi and village industry cooperatives, 1190 coir cooperatives, 611 handloom cooperatives, 3284 dairy cooperatives, 394 industrial and 749 fisheries cooperatives. The dairy cooperatives in Kerala operate in three tiers. The Kerala Cooperative Milk Marketing Federation Ltd (KCMMF) is the apex body. Below, there are three regional cooperative milk producer unions and further below, there are the village level dairy cooperatives. Matsyafed is the apex cooperative of the primary level fishermen welfare cooperative societies.

The cooperatives in Kerala play a vital role in mobilising people and pooling their resources to meet the common needs of members and thereby the larger society. The approach paper to the 13th Five Year Plan prepared by Kerala State Planning Board in 2016 indicated that there were 70 types of cooperative societies engaged in various kinds of economic and business activities in the State. They were categorised as Apex societies (12), federal societies (4), central banks (14), credit societies (4045), consumer societies (20), primary societies (4651), marketing and processing societies (615) and miscellaneous societies (5926). In 2020, the 13 central banks (the District Central Cooperative Banks; DCCBs) were merged with the Apex bank (the Kerala State Cooperative Bank) to form the new *Kerala Bank*.

Thus, unlike in the advanced economies where the cooperative movement was largely apolitical and outside the sphere of government influence, the cooperative sector in Kerala experienced an active role of the government in their development and functioning. In fact, most of the cooperatives in Kerala have a government shareholding in its paid-up capital with the levels differing widely across regions and sectors.

Table 1 Budgetary support for cooperatives in Kerala, 2012-13 to 2020-21, in Rs crore

Year	State Plan Outlay		SDG support		Total Outlay		Gross Plan
	State Plan	NCDC Support	State Plan	Central Share	State Plan	Central Share	
12th Five Year Plan							
2012-13	62.00	50.00	0	0	62.00	50.00	112.00
2013-14	70.00	30.00	0	0	70.00	30.00	100
2014-15	83.39	35.00	106.39	51.34	189.78	86.34	276.12
2015-16	85.39	45.00	14.28	0	99.67	45.00	144.67
2016-17	95.00	45.00	0	0	95.00	45.00	140
13th Five Year Plan							
2017-18	130.00	55.00	28.76	100	158.76	155.00	313.76
2018-19	154.75	65.00	324.95	100	479.70	165.00	644.7
2019-20	154.25	65.00	28.1	5.31	182.35	70.31	252.66
2020-21	134.96	65.00	4.62	22.5	139.58	87.50	227.08

Source: Kerala State Planning Board.

Notes: SDG: supplementary demand for grants; NCDC: National Cooperative Development Corporation.

Unlike other states, the cooperative movement has been strongly supported through the successive plans and supplementary grants in Kerala (see Table 1). Further, the annual plans lay emphasis on making the sectors ‘cooperative friendly’, thereby enhancing the effectiveness of scheme implementation by departments. In the project document of *Subhiksha Keralam* project, the Kerala State Planning Board gave major emphasis for the promotion of farming through cooperative institutions and with cooperative credit support. The Special Liquidity Facility (SLF) extended by NABARD was effectively utilized for food production by channelizing it through 1643 Primary Agricultural Cooperative Credit Societies (PACS) in the State.

II EMERGING ISSUES AND THE WAY FORWARD

In this section, we highlight some of the major issues that have plagued the cooperative sector in Kerala and the potential steps to address them.

Reduction in the proportion of non-functional to functional societies

There has been a surge in the number of cooperative societies in Kerala over the years. Between 2013 and 2019, the total number of societies under the RCS increased by 10 percent from 14,205 to 15,761 (see Table 2). However, there has not been a commensurate reduction of growth in the number of non-functional societies in Kerala.

Table 2 Year-wise distribution of non-functional cooperative societies in Kerala, 2013 to 2019

Period	Total number of societies	Number of functional Societies	Number of non-functional Societies	Share of non-functional to functional (%)
Mar-13	14205	10830	3375	31
Mar-14	14602	11270	3332	30
Mar-15	14896	11565	3331	29
Mar-16	15287	11908	3379	28
Mar-17	15428	11966	3462	29
Mar-18	15624	11892	3732	31
Mar-19	15761	11994	3767	31

Source: Compiled from the Economic Review, various years, Kerala State Planning Board.

By the end of March 2019, one in every three societies remained defunct. The policy on the cooperative sector needs to address this aspect. These societies are either dormant or are under liquidation. For example, as on 31 March 2017, there were 680 societies under liquidation, which was 4.3 per cent of the total number of societies. The district level data show district to district variation, which clearly coincides with the performance of the cooperative sector in these districts (Table 3).

Table 3 Distribution of non-functional cooperative societies in Kerala, 2017

District	Total number of societies	Number of functional societies	Number of non-functional societies	Share of non-functional to total societies (%)
Trivandrum	2139	1424	715	33
Kollam	1269	879	390	31
Pathanamthitta	653	559	94	14
Alappuzha	1027	773	254	25
Kottayam	1020	797	223	22
Idukki	740	426	314	42
Ernakulam	1406	1145	261	19
Thrissur	1478	1123	355	24
Palakkad	917	710	207	23
Malappuram	1089	942	147	13
Kozhikode	1221	1099	122	10
Wayanad	437	244	193	44
Kannur	1415	1318	97	7
Kasargode	617	527	90	15
State	15428	11966	3462	22

Source: RCS, Kerala; Statistical Abstract 2016-17.

Table 3 shows the distribution of non-functional societies in different districts of the State. There is a higher proportion of non-functional societies in three districts viz., Idukki, Trivandrum and Kollam. The reasons for this may be largely attributed to the financial performance of individual societies, the weak supervisory structure and lack of coordinated efforts to understand the problems of these societies to suggest remedial actions. Through the plan schemes, the government allocates considerable amount of assistance to these societies every year. But apart from such endowments, there has been very little technical support provided to these societies to overcome their problems. Any attempts to generalize solutions may not produce the desired results. The Department of Cooperation should facilitate the auditing of each of these societies by a team of experts consisting of professionals. Once such an audit is completed, the issues including human resources, technical and financial can be better understood. The northern districts which show lesser percentage of non-functional societies have better supervisory mechanisms. For example, the (erstwhile) District Cooperative Banks had established PACS Development Cells (PDC) with the help of NABARD for improving the working of PACS.

Need for technological interventions

The new age firms thrive on the three dimensions of Technology, Trust and Value. This philosophy aligns with the spirit of the cooperative movement too. However, technology infusion is a grey area for Kerala cooperatives. There have been considerable efforts to implement IT-based solutions for the financial management of individual PACS. However, there has also been very little headway in the implementation of a unified software for all PACS. Due to this, customers of individual PACS are unable access the facilities of other PACS. Through technology adoption by way of unified platform, the customers can move from a captive environment to a trajectory of broader and convenient banking experience.

Formation of subsidiary enterprises

The new age challenges for cooperatives demand the alignment of trust and technology with the spirit of cooperation. Cooperatives need to sow the seeds of the establishment of successful enterprises by the transformation or creation of subsidiaries. By the word transformation, we mean adjusting to the new financial standards, new technologies, and a new outlook for creating value-driven enterprises. The new age enterprises are driven by valuation rather than profits. The valuation is based on future cash flows and exponential growth potential.

While cooperatives may not be able to fund such subsidiary enterprises fully, such as Farmer Producer Organisations (FPO), or from their own sources, substantial funding needs to come from outside the system. The funding support usually depends on how much value the enterprise brings to the investor, which appears to be in contradiction with the model of cooperatives, particularly with regard to ownership. The ownership lies with the members and the members normally do not focus on long term returns and accumulation of wealth for future returns, which in turn are the drivers of valuation. The 14th objective of the Kerala Cooperative Policy deals with revisiting the provisions of KCS Act to face newly emerging situations. We need to initiate and coordinate efforts to transform the sector so that value is created in the sector to pave way for additional investment from diverse sources including private equity.

Correcting the age factor

It is often noticed that rural cooperatives associate themselves with senior citizens and that there is an absence of involvement of youth in the business and development activities. This makes cooperatives aging enterprises. The previous point of transformation is the key, which will bring youth into the sector. The European cooperative enterprises stand apart in the world because of the active participation in governance and use by the youth. As an economic institution, cooperatives compete with other forms of organisations. The potential customer base has a significant proportion of youth. So, the cooperative institutions have to evolve products that focus the youth, which are user friendly and free from governance through archaic rules.

The 10th and 11th objectives of Kerala State Cooperation Policy mentions the involvement of youth. This needs to be implemented in its letter and spirit. The AI-based solutions play a greater role in creating a conducive ecosystem for attracting the youth. The cooperatives can also engage in funding new enterprises, especially the start-ups. Cooperative institutions with their local feel and presence can turn themselves into local ‘engines of growth’ through technology adoption, professionalization thereby providing gainful employment to the rural youth and thereby transforming themselves into ‘youth driven institutions’.

Professional approach to governance

It is well known that any financial restructuring of cooperatives without addressing the root causes of their weaknesses would fail to create a sustained revival of the system. This broad approach is applicable to the apex bodies of cooperatives and PACS in Kerala. Kerala has already taken the bold step of transforming its bulky three-tier structure of cooperatives to a two-tier structure of cooperatives in 2020 by forming the Kerala Bank. The merger is not completed, as only 13 DCCBs were amalgamated to the Apex Bank. The approach to the formation of Kerala Bank clearly indicates the roadmap to professionalization, technology infusion and transformation into a leading and modern financial institution. However, the base entities also have to be professionalized. The Cooperative Policy, in its 6th objective, states that “the State shall infuse professionalism in cooperative department and transform the department

so that it keeps pace with the changes that take place in technological and regulatory environments". This process needs to be hastened.

CHAPTER 5.6

FOREST GOVERNANCE: NEED FOR NEW PRIORITIES

I INTRODUCTION

Proximity to the tropics, copious rainfall, relatively high humidity, and fertile soil are factors responsible for the evolution of highly diverse ecological systems in Kerala. The total extent of forests in Kerala is 11,524.4 km² (29.9 per cent of the geographical area), of which an extent of 9,339.2 km² is Reserved Forests, 284.2 km² is proposed Reserve and 1,900.9 km² is Vested Forests and Ecologically Fragile Lands. These range from tropical evergreen, semi-evergreen, moist-deciduous, dry-deciduous, *shola*-grasslands to mangrove forests. Of the total forest area under the control of the Kerala Forest Department, natural forests form 78.4 per cent and plantations form 13.5 per cent; the remaining 8.2 per cent is under lease and forest land under the Forest (Conservation) Act, 1980.

Forests are also the source of all the 44 rivers in the State apart from providing other ecosystem goods and services. There are around 1000 human settlements (both tribal and non-tribal) and private estates located as “enclosures” within the forests in remote locations. There are 484,839 tribal persons belonging to 36 tribal communities living in 725 settlements; they constitute 1.5 per cent of the total population in the State.

The administrative context

Duties and responsibilities of Forest Department include the protection of forests and wildlife, extraction of timber and other forest produce, management of Protected Areas (PAs), survey and demarcation of forest boundaries, soil and moisture conservation, implementation of participatory forest management programmes, management of human-wildlife conflict, implementation of programmes for nature and wildlife education, extension and interpretation, conservation of biodiversity, research on biodiversity conservation and natural resource management, production of genetically superior planting materials, tribal welfare activities, development of forest management information system, conducting cases in the Courts and legal support, managing issues related to captive elephants, licensing of sawmills and wood-based industrial units, improved intelligence gathering and investigations of cases with inter-state and international ramifications.

The wildlife wing of the Forest Department manages 3,213.2 km² of forests under the Protected Area network, which includes five National Parks (NPs), 17 Wildlife Sanctuaries (WLS), two Tiger Reserves (TRs), and one Community Reserve (Kadalundi-Vallikkunnu). There are several High Value Biodiversity Areas (HVBAs), such as New Amarambalam, Kulathupuzha, Siruvani-Muthikulam, Goodrickal, Malayattor, Camel's Hump Mountains, Chembra, Elambiler, Aranamala, Kattimattam, Vellarimala, Vavulmala and Thirunelli. The list of PA network and territorial forest Divisions in Kerala are given in Tables 1 and 2 respectively.

II CHALLENGES TO FOREST MANAGEMENT IN KERALA

Kerala has a complex mix of land-uses where conservation, livelihoods and economic production assume equal primacy and profoundly influence each other. Over the past decades, forests in Kerala have been subjected to large-scale human interventions. Extensive areas of

forests have been converted to commercial tree plantations (like teak and eucalyptus), cash crops (like cardamom, coffee, tea, rubber and pepper) and areas of cattle ranching. Interventions like road construction, river-valley projects, urbanisation and mass tourism have also reduced the forest cover. Poverty and economic backwardness among forest-dependent communities continue to exert pressure on forest resources. Besides, encroachment, wildfire, proliferation of invasive species, poaching, mining, excessive firewood collection, non-compatible land-use, changes in cropping pattern, 'honey-combing' due to human habitations inside forest enclosures and climate-induced ecosystem malfunctions have further led to the degeneration, fragmentation, and loss of vital habitats. More recently, Kerala has also witnessed extreme and erratic weather events, destructive cycles of drought and flood, human-wildlife conflict and diminishing livelihoods from forests.

Table 1 List of Protected Areas in Kerala, area in km²

Sl. No.	Name of WLS/NPs	Year of formation	Total Area (km ²)
1	Periyar WLS (Tiger Reserve)	1950	925.0
2	Neyyar WLS	1958	128.0
3	Peechi-Vazhani WLS	1958	125.0
4	Parambikulam WLS (Tiger Reserve)	1973	643.7
5	Wayanad WLS	1973	344.4
6	Idukki WLS	1976	70.0
7	Eravikulam NP	1978	97.0
8	Peppara WLS	1983	53.0
9	Thattekkad BS	1983	25.0
10	Silent Valley NP*	1984	237.5
11	Shendurney WLS	1984	171.0
12	Chinnar WLS	1984	90.4
13	Chimmony WLS	1984	85.0
14	Aralam WLS	1984	55.0
15	Anamudi Shola NP	2003	7.5
16	Mathikettan Shola NP	2003	12.8
17	Pambadum Shola NP	2003	1.3
18	Mangalavanam BS	2004	0.02
19	Kurinjimala Sanctuary	2006	32.0
20	Choolannur Pea Fowl Sanctuary	2007	3.4
21	Kadalundi-Vallikunnu CR	2007	1.5
22	Malabar WLS	2009	74.2
23	Kottiyoor WLS	2011	30.4
TOTAL			3213.2

Source: Department of Forests, Government of Kerala

Note: BS-Bird Sanctuary; CR-Community Reserve; NP-National Park; WLS-Wildlife Sanctuary

The devastating flood that wreaked havoc in Kerala in August 2018 and August 2019 caused major damages to the social, economic, human and ecological infrastructure of forests. It impacted the forests through loss of vegetative cover, widespread landslides, washing away of humus and topsoil, formation of gullies and ravines and reduction of overall water retention capacity. The poor and the disadvantaged, particularly the tribals living in forest enclosures, suffered maximum losses during these floods. The Post Disaster Needs Assessment (PDNA)

report prepared by the government identifies “heightened vulnerability” of forest enclosures and calls for integrated and innovative approaches for forested landscapes. The ability of forests to absorb the intense and incessant rains was significantly reduced in forest enclosures and degraded forests due to the absence of stable multi-canopied vegetation that contributed to flash floods and landslides. Remote and far-flung settlements also suffer from the poor reach and penetration of rural development schemes, poor access to education and healthcare and markets, which creates precarity in their existence and recovery. To compound these, the forest enclosures are also bearing the brunt of human-wildlife conflict causing considerable hardships and unrest among people.

Table 2 List of territorial Forest Divisions in Kerala with extent, area in km²

SN	Forest Division (FD)	Reserve Forests (RF)	Proposed Reserve	Vested Forest (VF)+EFL	Total
Southern Circle, Kollam					
1	Thiruvananthapuram	359.124	5.8253	3.651	368.6003
2	Thenmala	123.432	-	7.735	131.167
3	Achencoil	284.3298	-	0.2082	284.538
4	Ranni	1050.336	7.16	1.568	1,059.06
5	Punalur	280.051	-	0.169	280.22
6	Konni	320.643	11.021	-	331.664
Total		2417.9158	24.0063	13.3312	2455.253
High Range Circle, Kottayam					
7	Kothamangalam	316.8451	-	0.1576	317.0027
8	Munnar	440.49	175.275	2.45	618.215
9	Marayoor	13.972	47.26	0.076	61.308
10	Mankulam	90.06	-	-	90.06
11	Kottayam	627.287	-	31.967	659.254
Total		1488.6541	222.535	34.6506	1745.84
Central Circle, Thrissur					
12	Vazhachal	413.944	-	-	413.944
13	Chalakydy	279.7098	-	-	279.7098
14	Malayattoor	617.2411	0.5248	-	617.7659
15	Thrissur	293.743	-	4.3137	298.0567
Total		1,604.64	0.5248	4.3137	1609.476
Eastern Circle, Palakkad					
16	Mannarkkad	150.7322	-	271.7213	422.4535
17	Nilambur North	57.9196	0.0171	340.7032	398.6399
18	Nilambur South	267.3894	-	57.8888	325.2782
19	Palakkad	73.41	-	162.0847	235.4947
20	Nenmara	205.517	-	150.2104	355.7274
Total		754.9682	0.0171	982.6084	1737.594
Northern Circle, Kannur					
21	Kozhikode	24.3998	22.966	243.0856	290.4514
22	Wayanad North	134.024	15.064	65.8527	214.9407
23	Wayanad South	66.1381	6.8449	274.681	347.664

SN	Forest Division (FD)	Reserve Forests (RF)	Proposed Reserve	Vested Forest (VF)+EFL	Total
24	Kannur	121.3702	0	65.2014	186.5716
25	Kasaragode	86.0221	0	33.7083	119.7304
	Total	431.9542	44.9643	682.529	1159.358
	Grand Total	6698.1302	292.0475	1717.4329	8707.521

Source: Department of Forests, Government of Kerala

III

FORESTS AND WATER SECURITY OF KERALA

The repeated floods of 2018 and 2019 were critical for forests in Kerala. A closer analysis of the trail of events brings forth the problem of the hydrological security. There are four factors impacting the water scenario of Kerala.

Built-up area

Out of the total geographical spread of 38,863 km², the total built-up area (houses, buildings, roads, pavements etc.) in Kerala comes to around 6,000 km². These are surfaces made permanently impermeable for water infiltration. It is only reasonable to presume that Kerala may end up having one-fourth of its total area permanently under tar, mortar, concrete and tiles in the not-so-distant future.

Reservoirs

Most of the 90 odd reservoirs in the State face acute problems of siltation. The conventionally assumed role of reservoirs as water impounding structures during times of excess rains and providers of sustained water during drought has significantly reduced over the years.

Wetlands

The swamps, wetlands and paddy fields of Kerala used to be major storage areas of water. However, these have dwindled and almost irretrievably lost during the last four decades. For instance, the extent of paddy fields in Kerala is just one-fifth of what it used to be three decades ago.

Forest ecosystems

Forests are the source of all the river systems of Kerala. They perform two vital functions: interception of high intensity rainfall and facilitation of deep percolation and retention of water. This has an important bearing on the cycle of flood and drought also. However, it is estimated that the current ability of the forests to perform hydrological function is only about 30-40 percent of what may have been possible if forests were green, healthy and intact. Fragmentation and degradation are the reasons attributed for this. Factors that cause degradation and fragmentation of Kerala's forests, *inter alia*, include uncontrolled forest fires, grazing, encroachment, monoculture plantations and linear intrusions like roads and canals.

Among these four factors, major interventions and course-corrections may not be possible in the case of the first three. However, the fourth factor – forests – offer the best possible option for improving water security. If we can improve the hydrological functionality of the forests from

the current 30-40 per cent to 60-70 per cent, it would be a cost-effective method. In essence, this means addressing and removing factors that cause forest fragmentation and degradation.

IV *THE FUTURE APPROACHES*

There is enough scientific evidence and knowledge to show that the long-term ecological security of Kerala lies in securing and safeguarding its forests and other natural resources. However, at the same time, the legitimate livelihood and development aspirations of the people also need to be addressed. In other words, Kerala requires a governance approach in forest-dominated landscapes that does not compromise the ecological functions of forest resources while addressing the genuine developmental and livelihood requirements of people. Improving the ecological integrity of the forests while addressing the genuine developmental and livelihood aspirations of people are central to this approach. In furtherance of this, the following approaches are proposed:

- 1) Relocation of private settlements located inside the forests
- 2) Acquisition of private estates located inside the forests
- 3) Securing identified elephant corridors
- 4) Consolidation of forest boundaries through survey and demarcation
- 5) Resumption of unused forests areas given on lease
- 6) Regularization of pre-01/01/1977 land encroachments and eviction of illegal occupation and encroachments from forests
- 7) Swapping the habitations of forest-dwelling communities as a strategy to address human-wildlife conflict, disaster-risk reduction and improving access to livelihoods and welfare measures
- 8) Rationalization of boundaries of Protected Areas
- 9) Consolidation of mangrove forests
- 10) Restoration of industrial plantations to natural forests
- 11) Rationalizing Teak Plantations
- 12) Unlocking the potential of NTFP-based forest livelihoods
- 13) Effective implementation of the Forest Rights Act, 2006
- 14) Addressing human-wildlife conflict
- 15) Moving towards the landscape management

Approach 1: Relocation of Private Settlements

This approach is about relocating the private settlements (non-tribal) located inside the forests by paying suitable compensation. Prior informed consent and written willingness shall be the basis for this voluntary relocation. It is estimated that around 2000 ha of forest enclosures can be converted to natural forests through this process.

Approach 2: Acquisition of Private Estates

This approach is about acquiring the private estates located inside the forests. These estates were established by clearing dense natural forests, mostly located on steep slopes of forested mountains. Restoring them back to natural forests shall significantly reduce the likelihood of calamities like landslides apart from improving the hydrological functions of the forests. Restoration of these estates is also expected to reduce the incidences of human-wildlife conflict. It is estimated that around 3000 ha can be restored to natural forests through this process.

Approach 3: Securing Identified Elephant Corridors

The Ministry of Environment, Forests and Climate Change with support from the Wildlife Trust of India, New Delhi has identified seven critical elephant corridors in Kerala. Of these seven, one corridor (Thirunelli–Kudrakote corridor) has already been completely secured. Two other corridors (*viz.*, Nilambur Kovilakam–New Amarambalam and Mudumala–Nilambur via O’ Valley or Ouchterlony Valley) do not need any land acquisition. The acquisition of Kottiyur–Periya corridor – i.e., 66.3 ha – is in progress. This leaves us with three remaining corridors that need to be consolidated: (a) Begur–Brahmagiri, 247.8 ha; (b) Nilambur–Appankappu, 23.3 ha; and (c) Periyala at Pakranthalam, 13.46 ha. Apart from significantly reducing the issues of human-wildlife conflict, this approach shall also consolidate some of the most disaster-prone areas of the State (in Wayanad and Nilambur) under forest cover.

Approach 4: Consolidation of Forest Boundaries through Survey and Demarcation

Considering the importance of consolidating the remaining forests tracts, intensive efforts need to be made to get the forest lands surveyed and demarcated. Apart from the ecological- and enforcement-related reasons, demarcation of forest boundaries is highly essential for settling the legal disputes relating to forest boundaries. It is estimated that the total length of boundary of forests in Kerala is 16,845.8 km of which 5,291.1 km is natural boundary. That is, the total length of forests that require demarcation is 11,554.7 km of which 9,541.8 km has already been demarcated. The remaining 2,012.7 km boundary of forests of Kerala needs consolidation and permanent demarcation.

Approach 5: Resumption of Unused Forests Areas Given on Lease

Around 55,711.1 ha of forest lands have been given on lease to public sector units in the past for various purposes including cultivation. Plantations of cash crops such as rubber, cardamom, coffee and tea as well as agricultural crops exist in such leased out areas. It is noticed that there are extensive areas within these leased out tracts that are unused and still maintain the characteristics of original forest formations. Such unused forest areas can be resumed back to the Forest Department for conservation and management.

Approach 6: Regularization of pre-01/01/1977 Encroachments and Eviction of post-01/01/1977 Illegal Occupation and Encroachments from Forests

While granting clearance under the Forest (Conservation) Act, 1980 for the diversion of 28,588 ha of forest land for regularization of encroachment prior to 01/01/1977, Government of India has stipulated that all post-01/01/1977 encroachments have to be evicted. Regularization of the pre-01/01/1977 encroachments could not be completed as equal extent of non-forest land needs to be located for afforestation. It is possible that private lands sourced by the state government (though relocation and acquisition) under the various approaches dealt with above could be taken as the non-forest land for the regularization of the remaining areas of pre-01/01/1977 encroachments. Along with this, efforts must be continued to evict all post-01/01/1977 encroachments (7,801.1 ha) and to implement schemes for eco-restoration of these areas.

Approach 7: Swapping the Habitations of Forest-Dwelling Communities as a Strategy for Mitigating Human-Wildlife Conflict, Disaster-Risk Reduction and Improving Access to Livelihoods and Welfare Measures

Around 1.5 per cent of the State’s population comprise of Scheduled Tribes who live in and around the forests in 725 settlements. In most of these settlements, aspirations for improved

infrastructure are on the rise. The demand for bringing development to such far-flung and remote areas means further disturbance to forests and escalating cost. However, the legitimate livelihood and development aspirations of the people also need to be addressed. Human-wildlife conflict and vulnerability to natural disasters induced by climate variabilities have also become serious in many tribal settlements located inside forests. In some places, tribal communities themselves have started demanding rehabilitation from interior forests to more suitable areas inside the forests that are more accessible, less prone to human-wildlife conflict and natural disasters.

Hence, as a strategy, it may be prudent to swap the location of such far-flung tribal settlements from the interior forests to other suitable areas (in the same eco-cultural settings) within the forests that shall be more permanent, ecologically benign and imply a value-for-money proposition. However, swapping of tribal settlements from interior to other suitable forest areas must be planned with extreme sensitivity including based on the prior, informed consent of the communities. Such rehabilitation processes that include swapping forest areas may also require the prior approval of the Central Government under the provisions of the Forest (Conservation) Act, 1980, the Wildlife (Protection) Act, 1972 and the Forest Rights Act, 2006.

Approach 8: Rationalization of Boundaries of Protected Areas (PAs)

Though many Protected Areas in the State have performed impressive roles in preserving species diversity at the individual level, their management effectiveness remains critically sub-optimal at the landscape level due to: (a) relatively small size in the case of most of the PAs; (b) incomplete representation of flora and fauna; (c) connectivity issues (like in the Idukki Wildlife Sanctuary); and (d) prevailing and emerging threats (including climate variabilities). In the current scenario, the existing PAs, already small sized and under considerable stress from various factors will lose their functional effectiveness with disastrous consequences for the ecological and hydrological integrity of the state.

Hence, through a technically robust and socially conscious process, the boundaries of the existing PAs must be rationalized with an aim of covering more high value biodiversity areas under the PA network. Public discussions are important in this regard.

Approach 9: Consolidation of Mangroves

Mangrove forests are vital coastal ecosystems dotting the seascape-landscape interface, and they form the primary barrier against rising storm surges, coastal erosion and absorption of flood waters. They are also the major breeding grounds of marine fishery stock and hence play a key role in many regional economies. In the beginning of the 20th century, Kerala had extensive areas under mangroves (100 km²), which are now reduced to just 21.1 km² across 10 districts. So far, the government has accorded legal protection for 4.4 km² area of mangroves only. The ownership of the remaining mangroves is with the Revenue Department, other departments, panchayats and private individuals. There is a need to protect these areas. That is, there is a need to accord legal protection to the remaining 16.7 km² of mangroves. While mangrove forests with the Revenue Department, panchayats and other government agencies can be notified under the Kerala (Forest) Act, 1961, mangroves with private individuals will need to be acquired and notified as Reserve Forests. It is estimated that around 12 km² of mangroves in private land must be acquired and restored. Further, mangrove-based rural livelihoods and income generating activities must be initiated.

Approach 10: Restoration of Industrial Plantations to Natural Forests

In the second half of the 19th century, with the formation of the colonial forest bureaucracy, the forests of Kerala were brought under organized management. Extraction of timber and accommodating the aspirations of expanding agriculture were the priorities of forest management till independence. Supplying raw materials to forest-based industries became the central tenet of forest management in the post-independent era with the enactment of the second National Forest Policy, 1952 and the formation of the Kerala State in 1956. Reeds and bamboos became main raw materials sourced from the forests for pulp, rayon and mat-weaving industries. Later, Acacia, Eucalyptus, Alnus and Tropical pines were introduced as fast-growing species to supplement the raw material requirements of industry. *Acacia mearnsii* (Black wattle) was also added to the list to cater to the tan industry.

These were times of nation building and industrial development. It was no wonder then that considerations of industrial growth took precedence over ecological security. In retrospect, however, these monoculture industrial plantations adversely affected forests and forest resources. Some of these plantations were established in highly ecologically sensitive areas such as high-altitude grasslands. Species like black wattle had also become invasive in high-altitude ecosystems.

The Forest Policy of 1988 shifted the priorities from the promotion of industrial plantations to biodiversity conservation as the dominant theme of forest management. More recently, the fury of climate variability-induced natural disasters, particularly recurring floods, have put additional responsibilities on forest management including in improving the hydrological services apart from conserving biological diversity.

Currently, Kerala has around 27,000 ha under industrial plantations (Acacia, Eucalyptus, Tropical Pines and Alnus). In view of diminishing requirement from the industries and considering the need for managing the forests as a bulwark against climate variabilities and for improving the water security, the Government of Kerala has taken a policy decision that the remaining industrial plantations (Eucalyptus, Acacia, Wattle and Pine) be phased out by 2024 and restored to natural forests. Most of these areas are already abandoned, in a highly degraded condition and overgrown with exotic invasive species. Considering that such a move would substantially improve the water retention capacity of forests, these degraded and abandoned industrial plantations are proposed to be restored back to natural forests. An estimated 27,000 ha of industrial plantations can be restored to natural forests through this process.

Approach 11: Rationalization of Teak Plantations

Since the 1840s, large tracts of natural forests of Kerala were converted to pure teak plantations. Thus teak, the “jewel of oriental forests”, became the premier species of plantation forestry in Kerala. As of now, Kerala has 90,978.1 ha of its forest land under teak plantations. This accounts for about 58.7 per cent of the total area under plantations with the Forest Department and 7.9 per cent of total forest area in the State.

For some time, there have been certain concerns regarding the performance and long-term prospects of the teak plantations. Declining productivity (particularly in second and third generation plantations), poor management of younger plantations and issues related to delayed silvicultural practices were some of them. The propriety of retaining the poorly managed teak plantations in the context of climate variabilities, invasive species and flood and drought incidences are also being pointed out. It is further noted that most of the teak timber reaching

the markets are now sourced from private holdings and the share of forest plantations are marginal.

In this context, it is now decided that the teak plantations falling in poor or degraded sites and those without any potential for development into successful plantations shall be restored to natural forests. Similarly, areas falling in disaster-prone areas (above 30° slope), wildlife corridors, riverine areas and high-value biodiversity areas also need to be restored to natural forests. It is estimated that around 50,000 ha of existing teak plantations will need to be reverted to natural forests based on the above decision and require eco-restoration.

Through the above approaches that pivot largely around the eco-restoration of disturbed/degraded forests, it is presumed that the hydrological functionality of forests can be improved manyfold at a minimum cost.

Approach 12: Unlocking the potential of NTFP-based forest livelihoods

One of the main objectives of forest governance is to provide means of livelihoods based on sustainable resource use. This shall prevent overexploitation of forests that would have otherwise been subjected to over-dependence, degradation and eventual biodiversity loss. Forests provide a large quantity of non-timber forest products (NTFPs) and approximately 27 percent of India's population, particularly tribal communities, is dependent on NTFPs for their sustenance and livelihoods. Non-timber forest products are estimated to contribute up to 60 percent of household income in some of the poorest rural villages. Non-timber forest products generate employment, substantial income and enable rural communities to offset multiple vulnerabilities.

Developing an efficient and operative NTFP management strategy is not a choice anymore but an imperative of forest governance, as NTFPs form the core of activities under the Forest Rights Act, 2006. There is also a need for synchronizing the Forest Rights Act and the Participatory Forest Management programmes. Notwithstanding the enormous economic, social and ecological significance, there are several critical issues affecting the NTFP sector in Kerala. The distribution, quantum and scale of NTFPs available in our forests and the pattern of resource use are inadequately known. Further, the markets for NTFPs are poorly studied and remain largely opaque. The rights of collectors are tenuous and access regulations are unclear in the absence of incomplete declaration of Community Forest Rights (CFRs). Often, the collection practices are not sustainable and value addition is weak. Moreover, primary collectors get only a small portion of the overall value of the produce.

Overall, there are many gaps in our current understanding of the range of NTFPs collected from the forests, their classification, socio-economic values, technical packages, trade, market mechanisms and policy and legal contexts for their sustainable use. This calls for a game-changing strategy. An increase in the share of the value of NTFPs accruing to the marginalized communities will have a strong impact on poverty as well as the stability of democratic governance in some of the backward areas of the State. Interventions aimed at greater transparency in the commercial value of NTFPs and more equitable sharing of revenue shall incentivize the forest-dependent communities as well as the Forest Department to conserve biological diversity. In sum, there is need for a structured approach for NTFP management from the forests of Kerala.

Approach 13: Effective implementation of the Forest Rights Act, 2006

The Forest Rights Act provides for recognition and vesting of forest related rights to the Scheduled Tribes and other traditional forest-dwelling communities. The various rights that can be provided/claimed are individual, developmental and community forest rights.

The Kerala Forest Department's Participatory Forest Management (PFM) guidelines lays down prescriptions for creating a space for conservation through people's participation. Through PFM, the tribal communities have been empowered to implement certain activities in forest areas, which aids in better management and conservation of forests. This also helps create a rapport between Forest Department and tribal communities and helps in providing appropriate livelihood opportunities for the tribal population.

The Forest Rights Act enacted in 2006 goes one step ahead and concurs formal rights to tribes and other forest-dwelling communities over forest land and its resources. It recognizes the tribal communities' rights over the forests they use/protect and enables them to use their own traditional knowledge and practices for managing the same. However, rights under the Forest Rights Act also come with duties and responsibilities. This provides a space for converging the PFM and FRA in a win-win situation.

Approach 14: Dealing with Human Wildlife Conflict

There are increasing reports of human-wildlife conflict from many parts of the state. Elephant, tiger, leopards and wild boar are the main animals involved in the conflict situations. Incidences of lives lost, crops and property damaged and retaliatory killings are on the rise. Loss of habitats, increasing population of wildlife, climate change and changing cropping patterns immediately surrounding the forests are the reasons attributed for this. Notwithstanding the efforts to address the situation through various means, it remains a major issue in the State. More cost-effective measures must be developed for addressing human-wildlife conflict with the involvement of local people.

Approach 15: Moving towards the landscape management

The forests perform multiple roles in Kerala that are reflected in the land-use in the forested landscape. Considerations of production forestry (timber, pulpwood), protection of wildlife (Protected Areas), catchment protection of river-valley projects, biodiversity conservation, NTFP management, tribal livelihoods, housing human enclosures and tourism, locations of agriculture and plantations and infrastructure and sources of river systems are major land-uses in the forested landscapes. This framework of forest governance is a product of the policies and priorities of the forestry sector as demanded by the society and economy from time to time.

For instance, colonial considerations were the main driving force behind the establishment of the Forest Department. Its present organizational arrangement as Circles, Divisions and Ranges were made when timber extraction and establishment of teak plantations were the major objectives of management. Large-scale clearing of natural forests for agricultural expansion took place during this period (i.e., the second half of the 19th century and the first half of the 20th century). In the post-independent era, in tune with the provisions of the second National Forest Policy of 1952, extensive monoculture plantations of Acacia and Eucalyptus were raised by clearing natural forests for producing raw materials for industries. Large tracts of forestland were also leased out for commercial horticulture and tree plantations or diverted for various infrastructure development projects. Formulation of Project Tiger and enactment of the Wildlife (Protection) Act, 1972 saw the genesis of wildlife conservation (Protected Areas) in areas rich in wildlife.

Social Forestry programme was started during early 1980s as an externally aided project to promote tree planting outside the forest areas. Participatory forest management was initiated during 1990s to enlist the support of the forest-fringe communities in forest conservation by addressing their livelihood requirements. Concerns of climate change and rights of tribal communities were other considerations that became important considerations in the first decade of the 21st century. Of late, “hydrological functions” have become the cornerstone of forest management. Paradoxically, currently, even though forests are viewed for multiple-use purposes, they are administered based on a highly compartmentalized framework.

This needs to be addressed when hydrology becomes the central tenet of forest governance. A hydrological framework for forest governance calls for a ‘ridge-to-valley approach’ where watersheds of major rivers become the focus of management planning and action. All the interventions in a landscape (comprising of several watersheds) from the source of a river till it joins the sea must have synchronization in planning and implementation. For instance, protecting a key water source from all sorts of disturbances (production felling, tourism or fire) is an imperative irrespective of whether it falls in forest or non-forest areas. This calls for an integrated governance approach based on landscape level considerations. In other words, all the land-uses within a landscape need to be synchronized and there must be concerted efforts to incorporate conservation-friendly practices in all land-uses operating in the landscape.

The health of a landscape essentially hinges on its resilience and functional ability to continue provisioning maximized ecosystem goods and services. Management effectiveness of a landscape unit is broadly a function of the following: (a) the extent of natural ecosystems (geographic spread); (b) continuity/connectedness with other landscape units; and (c) functional networking of individual sub-systems. Integrated management of all inter-connected land-uses in the landscape is going to be an important strategy (with impetus on urban forestry, climate change mitigation and hydrology) of forest governance in the future.

CHAPTER 5.7
WATER FOR KERALA'S DEVELOPMENT
STATUS, CHALLENGES AND THE FUTURE

I
INTRODUCTION: MAJOR ISSUES

Kerala's performance in the water sector is marked by multiple challenges. The growth of developmental activities and lack of proper management of industrial and urban effluents and non-point source pollution have generated immense pressure on water resources. The water ecosystems, like rivers, backwaters, and other water bodies are variously affected. The spatial-temporal inequality of water availability is growing both across the rural and urban areas. The state's capacity to sustain growing freshwater demand is being challenged. Both the availability and quality of water may tend to emerge as limiting factors to further social and economic benefits. A balance between growing demand and supply of water has to be appropriately restored.

Water, sustainable development and vision for the future

While addressing these five issues, the future vision for water management in Kerala should strive to achieve water security, long-term sustainability of water resources, equitable distribution of water, citizen stewardship over water, and a human rights-based approach to water management. To accomplish these visions, the state has to embark upon a series of activities, which include (i) restoration and protection of key water ecosystems like rivers, lakes, ponds, and flood plains, (ii) augmentation of usable water, (iii) basin wide cooperation, (iv) integration of surface and groundwater management, (v) water abstraction compatible to hydrological and environmental sustainability and (vi) empowerment and involvement of people through an institutional mechanism of local self-government.

These actions should be undertaken through stakeholders' participation, decentralisation, accountability, and improved technology to reduce water consumption for daily use in all sectors, particularly high water-consuming sectors like agriculture, manufacturing industry, and domestic use. It may not be possible to address all these issues at a time. However, it is important to develop a state-level framework, design location-specific actions, and plan for its execution within a given time limit.

Increasing demand and its potential impact

The development of water resources in Kerala has been largely driven by expanding population, urbanisation, growth of irrigation/ agriculture, food production, energy demand, macroeconomic process, and changing consumption pattern. Between 1951 and 2011, Kerala's total population grew by 148 per cent, but the urban population grew by 783 per cent. Per capita annual availability of freshwater declined from 14443 m³ in 1951 to 5301 m³ in 2021.

Although Kerala's population is expected to stabilise in near future, the demand for water may not decline. The high growth of urbanisation, rising living standards of the population, growth of per capita income and high levels of consumption and energy use will lead to an increase in water use. Urbanisation impacts the hydrological cycle in several ways. It extracts a significant amount of water from surface and groundwater sources and extends impervious surfaces. It prevents

recharge of groundwater, exacerbates flood risk, and pollutes water bodies through the discharge of untreated wastewater. Water quality is affected due to growing industrialisation, non-point source pollution, and lack of proper wastewater management and adequate sewage treatment facilities.

As the quality and quantity of surface water come under stress, society turns more and more towards groundwater to meet water demand. There is increasing dependence on groundwater for irrigation. The majority of human settlements, particularly in rural areas and urban fringes, depend on groundwater for meeting their daily needs. Several parts of the State have reported depletion of groundwater resources. Most of these impacts are manifested locally. The upstream-downstream conflict might exacerbate with increasing water demand. Besides, there are competing uses of water. The present institutional mechanism follows narrow sector-specific mandates. Thus, there is a fundamental disconnect that results in poor performance and negative impacts.

Risk-sensitive areas

Kerala has several risk-sensitive areas.

- (i) Low-lying coastal stretches particularly the Kuttanad area, and low-lying lands surrounding the Vembanad lake and other coastal water bodies. These densely populated coastal stretches are vulnerable to flooding, storm surges, and stronger winds. Availability of freshwater is a major challenge due to the brackish water environment.
- (ii) Islands within the backwaters, and barrier bars along the coastline that suffer from inadequate fresh water supply.
- (iii) Drought-prone areas that suffer from water shortage in certain periods during summer months. The areas that are often drought-affected are distributed in the districts of Palakkad, Wayanad, Kannur, and Kasaragod. There are places almost in all districts facing occasional water stress due to low rainfall or climatically draught years.
- (iv) The mountainous areas mostly inhabited by the Scheduled Tribe population. The rain shadow areas along the Western Ghats, particularly, the Attappadi valley in Palakkad and the Mayarur area in Idukki receive very low rainfall and experience drought conditions.

Besides these areas, the slums within the cities are also risk-sensitive areas. There are several stretches in the coast adjoining major urban centres, where tank water supply is found necessary to meet the demand for drinking water during summer months.

Emerging scenario in the context of climate change

Climate change and variability will compound the situation and the problems might aggravate particularly in the risk-sensitive areas. Climate change will affect water and other associated ecosystems in various measures. The frequency and magnitude of weather extremes will increase. Some of the impacts of climate change will be manifested through sea-level rise, change in rainfall pattern, and rise in water and ambient temperature. With the sea-level rise, saltwater will move further upstream along the estuaries, lagoons and rivers and, consequently, the freshwater environment downstream will be affected. The Kuttanad area, due to its location below sea-level, and other low-lying areas will experience an elevated risk of inundation as a result of rising sea levels.

Kochi city is one of the urban areas in Kerala, which is highly vulnerable to the sea-level rise. The water supply and sanitation infrastructures will also be under stress due to the sea-level rise. The islands and barrier bars will be exposed to the vagaries of rising sea levels. The temperature increase in water bodies will affect water quality and reduce their self-purifying capacity. The available reports indicate that several parts of the Western Ghats experience a rise in temperature of 1 to 2°C. This causes depletion of soil moisture and will affect agriculture. Crops with shallow root systems face water stress and productivity is falling. It will have serious repercussions on the livelihoods of the farmers. There is also the issue of urban heat islands. Energy demand for air conditioning is increasing at the household level to combat rising temperature. This will indirectly impact the water scenario.

Constraints on water resources management

Water resource management in Kerala faces several constraints:

- (i) The water ecosystems in the State are under severe stress due to gross alteration of catchments, land use change, deforestation, overexploitation of river bed deposits, human intervention, flood plain occupancy, and prolonged negligence to maintain traditional water structures. All these actions take place at a local level. However, there is a synergistic impact through aggregation. Repairing these altered ecosystems may not be an easy task.
- (ii) The data on surface water used are based on the computations that were attempted in 1974. There have been several changes in water availability, use, and demand afterwards. The rainfall pattern is also changing. Surface water data need updating. The method used for groundwater assessment is a generalised version. Geologically, the state is composed of several structural blocks. As a result, the aquifers are disjointed and localised. These realities are hardly factored in while assessing groundwater conditions.
- (iii) There is inequality in access to drinking water and sanitation services. Infrastructure for water supply is not adequate. The marginalised sections of the society face several problems of access. Wide variations in inter- and intra-urban and rural areas are another set of challenges in water management.
- (iv) In spite of multiple rules and regulations, the systems for industrial and urban effluent management are not at the desired level causing serious water quality problems.
- (v) Non-point source pollution is another major issue due to dispersed nature of settlements and intensive agricultural practices. Existing rules and regulations are not adequate to manage non-point source pollution.
- (vi) The existing water management follows a centralised system principally governed by the Kerala Water Authority (KWA). There are also several other organisations like KSEB, Water Resource Department, State Groundwater Board, Central Ground Water Board, etc., handling water resources. Lack of effective coordination at the resource management level and also at the use level poses problems to evolve proper water management practices.

II

STATE OF WATER RESOURCES: THE SUPPLY SIDE

Kerala is blessed with an abundance of rainfall (see Figure 1). Considering an annual rainfall of 305 cm during the water year of 2018-19, the average gross yield from rainfall in Kerala has been estimated at 118,523 mm³. However, due to undulating and asymmetric topographic, geomorphic settings and intrastate variations of rainfall pattern, rainwater availability in Kerala differs both from the coast to the Western Ghats crest in the west to east direction, and also between north and south Kerala. The rainfall varies temporally too. A little over 65 per cent of the total rainfall precipitates during the monsoon months. While south Kerala receives rainfall both during the southwest monsoon and the northeast monsoon, north Kerala receives rainfall only during the southwest monsoon. While Thiruvananthapuram district receives 33 per cent of the total rainfall during the northeast monsoon, Kasaragod district receives only 9 per cent of the total rainfall during the northeast monsoon. The orography modifies rainfall patterns and the foothill zone across the State receives the maximum rainfall. As a coastal State, Kerala is also blessed with ocean water and brackish coastal water bodies. However, here, we shall limit our discussion mainly to freshwater resources.

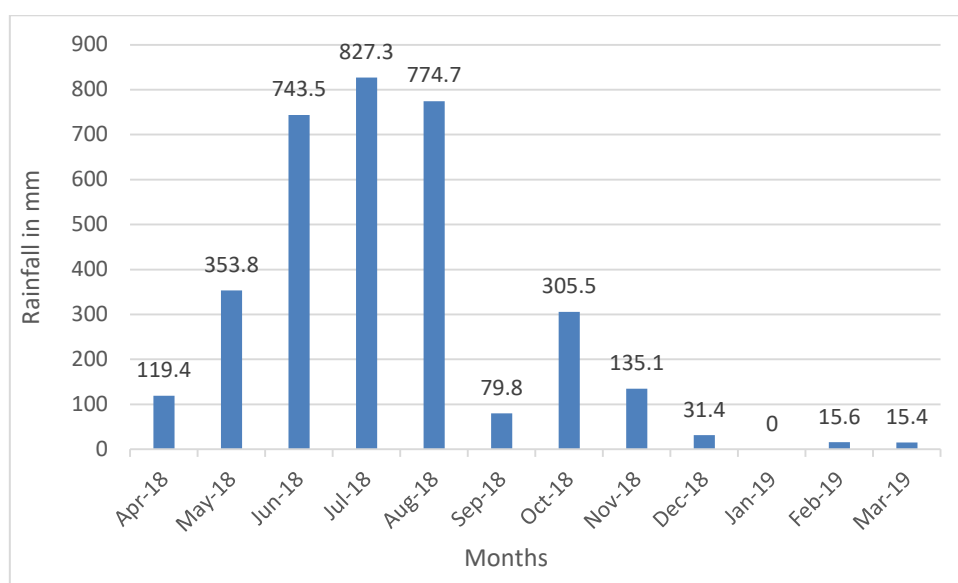


Figure 1 Monthly distribution of rainfall in Kerala, April 2018 to March 2019, in mm

Surface water availability

Forty four rivers drain Kerala and 41 of them are west flowing and discharge into the Arabian Sea. The remaining three rivers flow eastwards to the Cauvery River Basin. The total average annual yield of all the 44 rivers in Kerala is estimated as 70,323 mm³. This is about 30 per cent less than that of a single river like the Godavari. The utilisable yield in Kerala stands at 42,772 mm³.⁴⁶

Another estimate indicates that total surface water availability in Kerala, after accounting for losses due to evapotranspiration and interception, is about 54,410 mm³, of which 41,000 mm³ flows as surface runoff, 7900 mm³ infiltrates to recharge ground water and the rest 5510 mm³ is stored in reservoirs. Besides, there is water diversion as part of the interstate agreement with Tamil Nadu. It is not possible to plan to use the entire quantity of 41,000 mm³ of water. Some

⁴⁶ The calculation of utilisable yield is based on an assumption that almost the entire runoff from the areas above 75 m contour and 50 per cent of the runoff from the areas lying between 15 m and 75 m contour are utilisable. The entire runoff from the areas below 15 m contour is considered not utilisable. On an average, one square kilometre of the catchment area in Kerala yields 1.81 mm³ of water of which 60 per cent is usable.

amount of freshwater is required as environmental flow to maintain the functioning of the hydro-ecosystem of all water bodies, like rivers, lakes, and backwaters. A certain amount is required to prevent salt water ingress from the sea and some flow should be maintained to flush out wastes that are regularly discharged into the rivers from human settlements. About 40 per cent of flow should be allowed for all these functions and the rest 60 per cent may be considered as annual utilizable water. However, even this may not be feasible because rivers are rain-fed in nature and hence experience wide variations in flow between non-monsoon and monsoon seasons. As a result, drawing 60 per cent of the water during non-monsoon months may not be practical; rainfall is the main source of all available water and it is mostly concentrated during the monsoon months. While annual water availability indicates a surplus, there is a deficit of 7142 mm³ during the summer months (see Table 1).

Table 1 *Availability and demand of water in Kerala, 2001, in mm³*

Items	Annual		Summer months	
	Availability	Demand	Availability	Demand
Surface water	24,600		3690	
Ground water	5,135		5135	
Stored surface water	5,500		5500	
Domestic demand		1,226		809
Birds and animals		438		293
Industrial demand		6,400		3,200
Conservation of Kari land		5,000		3,500
Irrigation		13,665		13,665
Total	35,235	26,729	14,325	21,467
<i>Surplus/Deficit</i>	<i>(+) 8506</i>		<i>(-) 7142</i>	

Source: KRWSA; Kerala Development Report, Planning Commission.

The availability of water also widely varies across space. All the 44 basins are not equally productive. Water yield depends on rainfall, catchment character, drainage pattern, and land use. The catchment character of drainage basins in north Kerala, central Kerala, and South Kerala are different. The rainfall distribution trend is also different. All these are reflected in the total water yield and also utilisable yield as evident from the data worked out for sample basins chosen from all three segments of the State (see Table 2).

Table 2 *Annual yield of selected river basins in Kerala, in mm³/km²*

River basins	Area* (km ²)	Average discharge, 1998-99 to 2008-09 (%) [§]		Yield (mm ³ /km ²) ^{**}	
		Monsoon	Non-monsoon	Annual	Utilisable
Valapattanam (North Kerala)	1867	94	6	2.19	1.57
Bharatapuzha (Central Kerala)	6186	87	13	1.21	0.67
Chalakkudi (Central Kerala)	1704	86	14	1.83	1.19
Pamba (South Kerala)	2235	79	21	2.08	1.42
Vamanapuram (South Kerala)	867	70	30	1.53	1.03

Source: * Government of Kerala; [§] Central Water Commission.

Ground water availability

The total annual groundwater recharge in Kerala is 5769.23 mm³ and the net availability or extractable recharge is 5211.75 mm³. The net groundwater availability at the district-level varies

from 186.14 mm³ in Idukki to 591.44 mm³ in Palakkad. Thrissur has a net groundwater availability of 590.48 mm³. Average net availability was in the order of 0.13 mm³/km².

By 2017, the annual groundwater extraction for all uses was 2672.09 mm³ or 51.27 per cent of the total extractable recharge. Around 46 per cent of extracted ground water was used for irrigation and the rest 54 per cent were used for domestic and industrial supply. There are wide variations among districts in the matter of ground water use. In districts like Kasargode, more than 72 per cent of ground water draft is used for irrigation, whereas there are several districts that use more than 60 per cent of their ground water draft for domestic and industrial purposes.

Traditionally, people in Kerala depend on open wells for meeting their domestic needs and also for irrigating homestead gardens. There are about 4.5 million open wells in Kerala. The density of open wells is very high (around 150/km²), perhaps the highest in the country. On an average, more than 90 per cent of wells are used for domestic purposes.

The stage of development of groundwater varies from 24.51 per cent in Wayanad to 79.64 per cent in Kasargode. Based on the stages of ground water development it emerges that Chittur block in Palakkad is overexploited; Kasargod block in Kasargode and Malampuzha block in Palakkad are in critical condition. There were 30 blocks distributed across nine districts in the semi-critical category in 2017. In 2013, there were only 18 CD blocks under the semi-critical category. Also, extractable groundwater recharge declined by 6.93 per cent and net groundwater availability for future use declined by 3.94 per cent between 2013 and 2017. Extraction of groundwater increased from 46.63 per cent in 2013 to 51.27 per cent in 2017. If this trend continues, the groundwater scenario will be under stress in near future.

Freshwater lakes

While most of the natural wetlands are brackish, there are few freshwater bodies too. The important ones are Vellayani, Sasthamcotta, Pukot, Enamakkal, Manakkodi, Muriyad, Eravikulam, Devikulam, and Elephant Lake. The total area of these nine lakes is around 16 km². Among these nine freshwater lakes, three lakes – Sasthamcotta Lake in Kollam, Vellayani Lake in Thiruvananthapuram and Pukkot Lake in Wayanad – are important. Water from the Pukkot Lake is used for pisciculture and irrigation. Vellayani Lake and Sasthamcotta Lake supply drinking water for large urban areas. Kollam municipality and a couple of surrounding panchayats depend upon the Sasthamcotta Lake for their drinking water needs.

Ponds, tanks, and springs

Ponds and tanks are traditional rainwater harvesting structures used widely in tropical countries. The ponds in Kerala may be grouped under three types: (a) natural depressions (locally known as *chiras*); (b) excavated and man-made ponds or tanks; and (c) valley-head ponds or *talakkulams*. While the first two types are located in low-lying areas, the third type is found in the valley head. Many of the valley-head ponds in Kerala are associated with springs. Spring-fed ponds are perennial; however, all springs do not yield large quantities of water. CWRDM has identified 236 perennial springs in the State, of which about 20 per cent are being utilized.

The state has 995 large ponds with a minimum water storage capacity of 1500 m³ each. They are found throughout the state, but a sizable number of these ponds are located in Palakkad, which is drought-prone. Rainfall in this area is lower than in other parts of the State. Even the Thiruvananthapuram Urban Corporation area has 80 ponds, some of which are still in use. The Department of Water Resources has carried out a census of the ponds and has tabulated 45,000

ponds by giving a unique identification number. Most ponds and tanks in Kerala are small structures conforming to the region's more variegated topography. Nevertheless, they have helped the State to augment its water resources since the early days.

Water storage

Many of the rivers have been impounded in their upstream sections for irrigation and hydroelectric projects. There are 54 dams in Kerala, which includes 14 dams and six barrages maintained by Irrigation Department, 42 dams by the Kerala State Electricity Board and two dams maintained by the KWA. Total stored surface water in Kerala is estimated at 5,500 mm³ or 7.75 per cent of available water. Water is diverted through canals for irrigation during the dry season. It also helps to recharge wells in certain areas. But the reservoirs are of mixed blessings. On the one hand, they facilitate the generation of hydroelectricity, provide irrigation water for agriculture, facilitate pisciculture, and therefore contribute to development. On the other hand, they restrict the silt movement and regular river flow due to which the coastal areas are deprived of sediment supply. This in many cases leads to imbalance in coastal sediment distribution. With restricted sediment flow, nutrient movement is also reduced. This affects the productivity of coastal waters. Most of the reservoirs in Kerala are silted up. Impounding of new reservoirs is subject to various constraints. There are debates throughout the world about the viability of large reservoirs, particularly in areas with high seismic potential. Nevertheless, the usefulness of small reservoirs should not be undermined.

III

SECTORAL DEMAND FOR WATER AND THE PRESENT STATE

Water is necessary for all human activities. There is a competing demand and also multiple uses. However, water is managed/provisioned through various sectors. We intend to discuss the sectoral demand for water, accomplishments, and development challenges to meet these demands.

Drinking water, sanitation and human health (WASH)

The WASH is fundamentally important to lives, livelihoods, and sustainable development. Everyone needs access to adequate safe water for drinking, household use, personal hygiene, and sanitation. Kerala has progressed significantly in this matter. Nevertheless, there are areas and group of households that lack access to drinking water and sanitation. Efforts of 50 years of public intervention in creating drinking water facilities have not brought the desired results in many places. In some panchayats, drying up of wells during summer months is a common phenomenon that affects sizable number of households depending on well water. The worst sufferers are poor and landless households, small landholders, Scheduled Castes, and Scheduled Tribes. It is women who bear the brunt of the ordeal of fetching water from faraway places. Caste and gender-based inequities and economic inequalities are also dominant in several panchayats.

In March 2017, the total number of water supply schemes in operation under KWA was 1073 with a total installed capacity of 3367.13 MLD. It covered 1.81 crore people or 54 per cent of the total population in the State. The average per capita availability of piped water is 104.20 litres/day. Out of the 1073 schemes, 989 schemes catered to rural areas, and 84 schemes catered to urban water supply schemes. Given the present rate of consumption in the State as indicated

by the KWA, the annual water requirement for piped water supply will be 2310 mm³ by 2021 considering the projected population of the State at 34 million.

Household-level data from Census 2011 indicated that of 7.72 million households in the State, only over 29 per cent households were covered by tap water supply. Treated tap water was available for 23.35 per cent of households. Well-water was the main source of drinking water for 62 per cent of households and the bulk of these wells (47.4 per cent) were uncovered. Around 8.5 per cent of households depended on hand pumps, tube wells, bore wells, springs, rivers, and canals as the main source for drinking water. Also, 77.7 per cent of households had drinking water sources within their premises, 14.1 per cent have near the premises and the rest 8.2 per cent have to travel some distance to fetch water. Groundwater was the mainstay for meeting the domestic needs of more than 80 per cent of the rural and 50 per cent of the urban population.

Kerala Rural Water Supply and Sanitation Agency (KRWSA)/Jalanidhi Scheme

The KRWSA, popularly known as *Jalanidhi*, was entrusted in 2000 with the responsibility to facilitate the implementation of rural water supply systems as part of a World Bank-supported project. The first phase of this project was launched between 2000 and 2008. This phase covered 1.13 million people building 3663 village-level water supply schemes in 112 Gram Panchayats or 11 per cent of all gram panchayats. The second phase of the *Jalanidhi* project started in March 2017. 5072 *Jalanidhi* schemes were in operation under Phases I and II covering 1.49 million people. The highest number of schemes (929) was in Malappuram covering 3.16 lakh people.

Coverage alone does not fully reflect inequalities. Disparities are evident in the level of services related to safety, accessibility, and reliability of water services. There has also been the problem of slipping back. During 2016-17, the total number of habitations covered was 21,551 of which 152 habitations slipped back. An evaluation report by the Independent Evaluation Group in 2013 had noted that according to the independent household survey commissioned by the World Bank in 2008, 44 per cent of the community schemes reported periodic water shortages and actual water supply was 45 litres per capita per day (lpcd) against the designed average supply of 60 lpcd. The water supply fell to only 29 lpcd during the summer season. Some project schemes resorted to three days of rotational water supplies in the summer to serve all consumers.

Another survey in 2012 indicated that a majority of the beneficiaries drew water from traditional sources to supplement water supply projects. Although the project was rated 'satisfactory' based on relevance, efficacy, and efficiency, it was pointed out that "its performance towards the end of the project was less than its demonstrated potential". The project performance assessment report highlighted a few points that merit close scrutiny. These were: (i) poor quality of water, where 70 per cent of beneficiaries boiled their drinking water; (ii) lack of technical and executive hands for maintenance; (iii) dearth of experienced NGOs; (iv) dependence on donor agency for maintenance cost; and (v) institutional problems related to repair of major damages to community schemes. The issues identified in the evaluation report are significant from the user's perspective, affordability and policy planning. Investment deficit for aging infrastructure is also another area of concern.

Urbanisation

There are no appreciable differences between rural and urban areas in Kerala in the matter of drinking water supply, although, spatial disparities are well evident in the district-level disaggregated data. The KWA has reported that only 54 per cent of the urban population receive

pipled water supply. The coverage varies from 10 per cent in Kasaragod district to 87 per cent in Ernakulam district. Census 2011 showed that around 59 per cent of households in urban areas depended on well water against an all-India average of 6.2 per cent. Ernakulam, Palakkad and Thiruvananthapuram were only three districts, where more than 50 per cent of urban households had access to tap water supply.

Energy

Kerala's energy sector is dominated by hydropower, which accounted for 71 per cent of the total installed capacity of 2961 MW in 2017. This was in sharp contrast to India's dependence on hydel power for 14 per cent of its energy demand. There were 24 hydel power projects with a total installed capacity of 1921 MW in 2009, which increased to 2108 MW in 2017. Besides, there are 21 hydropower schemes at various stages of implementation. On completion, they are expected to add nearly 380 MW in installed capacity under hydel power. KSEB continues to invest in hydel power and tries to maintain the ratio of 80:20 between hydel power and thermal power.

High rainfall, an abrupt rise in slope along the Western Ghats scarp, and high-altitude plateau formation have provided the State certain unique opportunities to impound reservoirs and set up hydel power projects. However, the power sector in Kerala is vulnerable to rainfall variations on account of over-dependence on hydel power. Any fluctuation in rainfall directly impacts power generation. The drought in the year 1982-83 witnessed unprecedented power shortages in the State. Till that year, Kerala was considered as a surplus State. Dependence on hydel power makes Kerala's energy scenario green. However, there are geographic limitations to continue with the installation of hydel power projects, particularly large projects. In this context, small and micro hydel projects are gaining importance. There are successful models like Meenvallam micro-hydel project being developed in the Palakkad district.

Agriculture and food security

The utilisation of surface water for irrigation is not directly assessable. However, an indirect assessment can be made. As with any region, the major user of water in Kerala is the irrigation sector. The irrigation efficiency in the studies carried by CWRDM has been found to be as low as 40 per cent. By 2016, the net irrigation water utilisation was estimated as 3532 mm³ and the gross irrigation water utilisation was estimated as 8830 mm³. This is supplied from both the surface and groundwater sources. The groundwater usage for agriculture is estimated as 1221 mm³; the rest is met from surface water sources, which include major, medium, and minor irrigation structures.

Predicting the future demand in irrigation sector is a challenging task, especially in the context of climate change. Irrigation demand may rise if rainfall declines. At present, the area under irrigation is a little over 19 per cent. The water demand will increase with the expansion of irrigated areas. However, there are several constraints to expanding the irrigated area in Kerala due to the undulated nature of the topography, which also causes considerable loss of water. Irrigation water is required during summer months when the State faces a deficit. Hence, emphasis should be given to adopting modern techniques and scientific water management practices to improve efficiency.

Industry

Large-scale manufacturing industries are not prominent in Kerala. Industrial demand for water is relatively less compared to other neighbouring States except in Ernakulum district. Data on total water utilisation for the industry is not available. However, a CGWB estimate indicated that groundwater extraction for industrial use in Kerala was 14.39 mm³ by 2017. Number of water connections given by the KWA for industrial use was only 1623 in 2017.

According to FICCI, the current water utilisation for the industries in the country is 8.5 per cent of the total water abstraction, and out of which almost 45 per cent is from surface sources, 35 per cent from groundwater and 25 per cent from municipal sources. This ratio can be assumed for Kerala also even though it may be slightly on the higher side. Thus, the industrial water demand for the State was estimated to be 1015 mm³ in 2016.

Tourism and water recreation

Tourism and water recreation is an important economic activity in Kerala. It generates substantial revenue for the government. Water-based tourism, both in the sprawling backwaters and rivers in Kerala, invariably finds an important place in any discourse on tourism potential. Provisioning of potable water in the tourist centres is a priority activity. Views of the local inhabitants warrant due consideration while planning any project that intends to use water resources in which local people have stake. Any new idea on new accommodation, transport or entertainment should first necessarily consider the present status of water availability and these facilities as enjoyed by the residents of the area. Maintenance of water quality of the water bodies is an important issue in developing water-based tourism.

Environmental flow

Water is also required for maintaining aquatic habitat, wild lives and preserving environment. Though there no estimate of the water requirement to maintain ecosystem functions, it has been suggested that 40 per cent of river discharge may be left for all ecosystem services. One estimate indicated that 439 mm³ of water is required annually for the birds and animals. Acute shortage of water within the forest areas is often reported during summer months, which results in human-animal conflicts in the villages along the forest fringe. It is important to work out the environmental flow for all the rivers in Kerala.

IV

CHALLENGES TO WATER MANAGEMENT

Kerala faces several challenges in the matter of water management ranging from meeting sectoral demands to maintain ecosystem services of water. There are also challenges related to manage water-related extremes like flood and drought, source sustainability, and to improve the quantity of usable water availability.

Demand management

Demand for water is increasing in all sectors, particularly for domestic use, agriculture, industry, urban development, flushing out wastes from water bodies, energy, and ecosystem services. However, there are uncertainties about the precise amount of water required to meet all the demands. Meeting drinking water need is always a priority. The challenges in this sector are: (i) reaching out to the uncovered section of the population; (ii) improving the quality of the existing services; and (iii) ensuring bulk water availability to meet the unmet demand. There is a need to

evolve special management strategies for increasing the availability of water during the summer season.

Quantity management

Improving the quantity of available usable water is a big challenge. The amount of rainfall is more or less the same over the years. What is important is to devise intervention measures to increase the residence time of water on the land surface. Water harvesting through the four-water concept is gaining momentum for increasing water availability in many drought-affected areas. The four-water concept stresses using rain water, surface water, groundwater, and maintaining the availability of soil moisture in the upper part of the soil column. The overall water availability can be enhanced through conservation, proper maintenance and improvement of storage facilities, creating additional storage, renovation of derelict traditional water structures, and watershed management. Multi-usability of water resources will also to the gross availability.

The existing storage capacities of the dams are only 7.75 per cent of the available water. The national water policy of 1987 and the state water policy of 1992 had clearly stated that all existing and future reservoirs – both irrigation and hydel – should have a drinking water supply component. In addition to the Aruvikkara and Peppara reservoirs, which were built for water supply alone, only Malampuzha and Peechi have drinking water components (i.e., only four out of 30 reservoirs in the state). The best long-term solution for meeting most of the domestic and industrial water needs in the future is to draw water from all existing and future reservoirs. The irrigation projects which are under different stages of completion may be reviewed to plan for their timely completion.

Quality management

Deterioration of water quality, both surface water, and ground water is a major issue. Analysis of available data indicates that water quality is deteriorating over the years and more and more water bodies are recording higher BOD values. Water in most of the river segments is rendered unfit for consumption without treatment. The nutrient loading of water bodies is also increasing and in some cases is alarming. Several stretches of the rivers flowing through the cities show 'Urban River Syndrome'. Bacteriological contamination of groundwater is widely reported. Considering the fact that 62 per cent of households depend on wells for meeting drinking water needs, deteriorating quality of groundwater is a matter of serious concern.

Management of deteriorated groundwater is more complex than surface water as the sub-surface geochemical reaction between contaminants and earth materials is not always well-understood and the subsurface movements of pollutants are slow and difficult to detect. Further, the retention time of pollutants in ground water is much longer than that in surface water. Improving water quality of both surface and ground water is a huge task as it is also linked with solid and liquid waste management. Unsafe water, lack of sanitation, and hygiene are the leading causes of mortality and morbidity in several countries. Kerala recorded a 35.6 per cent increase in waterborne diseases from 2012 to 2016.

Water-related extremes and risk management

Kerala confronts water-related extreme events like flood. While some parts of the State like Kuttanad experience incidence of floods almost every year, the state as a whole suffers from flood problems from time to time. Landslides also occur in the Western Ghat areas during

monsoon months. Besides, the coastal surge is another issue affecting sizable parts of the coastline. All these incidences cause the loss of human lives and the economy.

The State witnessed devastating floods in the consecutive two years of 2018 and 2019. The flood of 2018 was an unprecedented event claiming 488 lives and affecting 56 lakh people across the State. Ten out of 14 districts experienced flood fury. More than 60,000 houses were devastated. Exposure of people to hydrometeorological hazards has been growing over the years. On one hand, the water holding capacity of river provenance is declining to cause high instantaneous flow and on the other hand there is a high reduction of flood cushioning area downstream. People are living in the flood plains and there is also a heavy economic investment in the vulnerable areas. Climate change is likely to increase flood incidence. The flood in 2018 was followed by low rainfall and a drought-like situation prevailed. One of the challenges is how to make Kerala water-related disaster risk resilient.

Restoration of ecosystem services, flood plain zonation, vulnerability assessment, and adaptation of nature-based flood management practices are necessary steps to address flood-related disasters. In recent years, there is stress on implementing nature-based flood protection measures or a hybrid of nature-based and structural measures for flood management across the world as purely structural measures are found to be inadequate. The nature-based measures stress system scale perspectives, including spatial scale, time scale, integration with ecosystem conservation and restoration, adaptive management, and people's participation. Room for rivers and increasing water holding capacity of the catchments are some of the new initiatives.

Increasing sectoral water use efficiency

There are two options to increase water use efficiency in agriculture: reduction of water losses and increase of productivity per unit of water use. Reduction of water loss can be attained through agronomic practices, changing crop calendar and irrigation management, such as the use of precision irrigation and participatory irrigation. The second option refers to increasing crop productivity i.e., producing more crops or value per volume of water used. Irrigation of high-value crops is important in this context. Besides, there are several other measures including use of technology to increase water use efficiency. It is important to understand the real potential of reducing water losses to avoid devising costly and ineffective demand management strategies.

A large proportion of the water abstracted in irrigation systems will return to the system. The quality and the timing of the return flow is important regarding the usefulness of the water for the downstream users. Irrigation systems, and more notoriously industrial users, often return polluted water to the system, effectively meaning that the water is not available for further use. In this case, an improvement in irrigation efficiency, whereby a smaller volume of water is abstracted and an even smaller volume returned, will mean a better quality of water is available for the next downstream user. If these systems are adopted, the pesticide pollution in the downstream water bodies can be controlled.

V

FUTURE DEVELOPMENT FRAMEWORK, STRATEGY AND ACTION PLAN

The future vision of water management in Kerala should be to develop the state as a water secure state. The framework proposed here is expected to lay the foundation to accomplish such a task. The development trajectory of Kerala is changing. Water management is a complex and

interdisciplinary issue encompassing the domains of science, technology, and society. The future water management and development strategy should address this complexity.

Developing an integrated water management framework

Almost all developed countries either have prepared or are in the process of preparing a water management framework for the country as a whole, and also for river basins. The best-known document is the European Union Water Development Framework. Adopted in the year 2000, the European Union's Water Framework Directive (WFD) is a major driving force influencing water management at the national, regional, and local levels in all the EU countries. The directive covers river basin management, requirements to coordinate water use within river basins and river basin planning. The WFD is the principal driver of recent changes in the scalar organisation of water governance and advocacy in Europe. Several other countries have also prepared similar documents.

In India, the Mihir Shah committee proposed a paradigm shift in water management in India by amalgamating two main organisations, namely Central Water Commission (CWC) and Central Ground Water Board (CGWB), and devise water governance both at the national and State level. It proposed integrated water management interventions suiting the contour of nature, partnership, inter-disciplinarity, demand management and sustainability as the central focus, and emphasised equity in access to water, transparency, and a national water framework law. Each state was expected to redesign their water management and water governance initiatives following this national guideline.

Resource augmentation: Strengthening the supply side

There are five broad areas that warrant attention to improve the water resource base and strengthen the supply side. Strategies for achieving each of these activities and proposed action plans are spelt out here:

Suitable and equitable water allocation for all water use sectors and fulfilment of basic water requirements

Strategies.

- Assessment of water resources of the State (updating the 1974 PWD report on water resources);
- Prioritization of water use for various sectors, i.e., agriculture, domestic, industry and conservation of ecosystem; and
- Setting up of water-use criteria/ proportions for the various sectors from the Panchayath through watersheds/ river basin to State level and promotion of conjunctive use of surface and groundwater (especially shallow groundwater).

Activities/ Action Plan.

- Preparation of inventory of water resources (both surface water and groundwater) in all the river basins;
- Updating and strengthening the information on water requirements of various sectors and forecasting of future needs and trends;
- Development of water resource potential and management plan for block panchayats and setting up guidelines for water allocation to various sectors;
- Allocation of water for the various sectors under the framework of river basin management plan, including ecosystem services; and

- Supplementation of groundwater-based irrigation in surface water irrigated areas during the lean season.

Improving the water use/ management efficiency

Strategies.

- Renovation of existing water resources infrastructures;
- Protection of water recharging ecosystems and natural resources;
- Replication of success stories of supply /water management to other feasible areas; and
- Precision water management.

Activities/ Action Plan.

- Survey and preparation of plan for rehabilitation of water sources and waterways, including development and conservation plans;
- Repair and improvement of distribution systems and control structures in order to reduce water losses and ensure desired water delivery;
- Periodic de-silting of reservoirs for increasing the water storage capacity;
- Renovation of the dilapidated irrigation ponds/tanks, check dams, *surangams* and other water storage/diversion/distribution structures;
- Empowerment of community organizations in taking care (planning, implementation and monitoring) of common property resources;
- Prevention of encroachments and protection of riverbanks by eco-friendly measures;
- Protection of water recharging ecosystems like forests, wetlands, paddy fields, mangroves, and sacred groves;
- Prevention of uncontrolled mining of sand, granite, clay and soil; and
- Replication of successful models to gear up the water conservation programs in the State.

Linkage of master plans of departments with river basin plan for holistic IWRM

Strategies.

- Preparation of the integrated river basin management plan for all the 44 river basins

Activities/ Action plan.

- Formation of required institutions; and
- Integration of the individual plans available in the line departments with river basin plans by ensuring stakeholders' participation.

Creation of new water conservation/ storage structures

Strategies.

- Exploration of the possibility for new structures on a priority basis in the river basins; and
- Promotion of water conservation.

Activities/ Action plan.

- Investigation in the river basins to locate suitable sites and feasibility studies (may be taken up in the Chalakkudi river basin to begin with);
- Exploration of paleo channels, ox-bow lakes and abandoned channels to promote as water storage structures;

- Taking of rainwater harvesting and recharge pits and percolation tanks in suitable areas on a watershed basis;
- Implementation of open well recharge treatments in all households;
- Adoption of suitable erosion control measures like contour bunds, terracing, etc. for soil and water conservation;
- Promotion of rooftop rainwater harvesting at household and institutional levels;
- Construction of check dams, barrages, dykes, VCBs, etc. in rivers/streams, wherever it is feasible;
- Construction of ponds/tanks, etc. in ideal locations; and
- Development of abandoned quarries as water harvesting and storage structures

Management of water quality problems for improving the water supply

Strategies.

- Improvement and sustenance of water quality.

Activities/ Action plans.

- Monitoring of water quality problems with special reference to each basin and preparation of a protection plan to arrest water pollution;
- Development of cost-effective materials for water purification, especially using nanotechnology;
- Surveillance and monitoring of water quality through public participation using sensor-based devices for water quality testing;
- Development of proper sanitation plans and sewage treatment plants; and
- Control of non-point source pollution.

Demand management in water

The water use sectors in Kerala are broadly grouped into five categories: (a) Domestic, including drinking water, (b) Irrigation, (c) Industry, (d) Hydropower, and (e) Ecosystem services, including wildlife needs. Strategies and proposed action plans are indicated below.

Domestic including drinking water: Providing 100 per cent safe drinking water to all

Strategies.

- Identification and prioritization of problematic areas;
- Reduction of water losses in distribution; and
- Development of water resources for augmenting the distribution of potable water

Activities/ Action Plan.

- Preparation of plan and implementation of domestic water supply schemes in problematic areas on a priority basis;
- Setting up of more community and village water supply systems by using both surface and groundwater;
- Setting up of more water treatment plants for ensuring safe drinking water; and
- Development of GIS-based distribution network along with sensors for improving the efficiency.

Increasing the gross irrigated area

The objective should be to increase the gross irrigated area in the State from the current level of 17.9 per cent of the gross cultivated area to 31 per cent.

Strategies.

- Preparation of Block-level and Panchayat-level irrigation plan by considering all the existing schemes and possible new schemes;
- Improvement of the water use efficiency for maximizing the water productivity; and
- Reorientation of irrigation management through decentralization.

Activities/ Action Plan.

- Preparation of framework for district level strategies for increasing the irrigated area;
- Assessment of the irrigation water availability and demand based on the cropping pattern of the panchayat, considering crop water requirements and irrigation recommendation for the crops in different agroecological units of the State;
- Completion of all pending major/medium/minor irrigation structures;
- Promotion of minor irrigation projects/schemes;
- Creation of new storage structures such as ponds, VCBs, barrages and check dams where feasible;
- Recharging of ground water in the existing overexploited and critical areas;
- Creation of more water diversion structures and development of springs in highland and midland areas, and more lift irrigation schemes in lowland areas;
- Irrigation of high value horticultural crops such as pepper, cardamom, vegetables, banana, etc. to attain maximum productivity;
- Increased involvement of Water User Associations (WUAs) through Participatory Irrigation Management (PIM) for enhancing the physical access of each individual plot to water by which more cultivable area may be brought under assured irrigation;
- Promotion of extension activities relating to water harvesting, water management and crop alignment for farmers and grass root level field functionaries;
- Improvement of drainage facilities in farm area;
- Enhancement of water utilization capacity of irrigation projects;
- Enhancement of the adoption of advanced micro irrigation and water saving technologies, precision farming, polyhouse farming and hydroponics to achieve more crop per drop;
- Reduction of irrigation water demand by proper planning viz., early sowing of variety, uniform way of planting in group approach, laser land levelling, mulching etc on a watershed basis.

Industry

The goal is to meet the industrial demand of 1200 mm³ by 2022 by achieving an increase of around 18 per cent over the current requirement.

Strategies.

- Defining the rights and responsibilities of the industries on water usage;
- Adoption of the principle of 3 R's (Reduce, Recycle and Reuse) in water use;
- Prevention of the pollutant load in the effluents for environmental protection;
- Locational analysis for new industries with respect to water resources.

Activities/ Action Plan.

- Preparation of guidelines defining water rights and responsibilities of various industrial sectors;
- Appropriate pricing of water for industrial use to improve the efficiency;
- Recycling of used water for industrial purposes;
- Installation of advanced effluent treatment plants (ETP) in all the industries and their periodic monitoring of the same by Pollution Control Board; and
- Evaluation of water availability before starting new industries and concurrent monitoring of water use, water availability and water quality.

Hydropower: Meeting the energy demand of the State

Strategies.

- Creation of new micro hydel schemes;
- Storage of enough water for generation of power considering the increasing energy demand under changing climate scenario.

Activities/ Action Plan.

- Investigation and construction of new micro hydel schemes in all possible locations;
- Periodic de-silting for enhancement of the storage since siltation is a major problem in the reservoirs; and
- Improvement in the use efficiency of existing hydropower systems with advanced technologies.

Ecosystem services

The objective is to ensure maintenance of ecosystem functions, provisioning of water for wildlife, biodiversity conservation and sustainability of water resources.

Strategies.

- Protection and conservation of ecosystem services, such as forests, wetlands and mangroves;
- Improvement of water availability in wild habitats;
- Sustenance of environmental flow in rivers; and
- Limitation of overexploitation of groundwater.

Activities/ Action Plan.

- Protection/forestation of various forest ecosystems;
- Identification of water sources within wild habitats and creation of necessary storage structures within forest areas for meeting the water needs of wildlife;
- Inclusion of more wetlands under the purview of Ramsar sites and implementation of Management Action Plan (MAP) of wetlands/Ramsar sites;
- Promotion of livelihood support system for wetland conservation, including inventorying and evaluation of the ecosystem services;
- Determination of required environmental flow in the rivers of Kerala; and
- Enforcement of legislative measures to check overexploitation of groundwater.

Water Related Disaster Management

Flood, sea surge, drought and landslides are common water-related disasters affecting Kerala. Landslides occur during every monsoon period in the hilly tracts. There had been several studies at different levels to address the problems of floods and landslides. The post-flood Kuttanad package of Kerala State Planning Board proposed a new approach to water management and other related activities including livelihoods. The interventions proposed under this package provides important lesson to develop Kerala, and particularly to make Kuttanad flood-resilient. The prime objective of water-related disaster management programme is to ensure effective preparedness as well as mitigation from water related disasters.

Strategies.

- To introduce an efficient flood, drought and land slide protection system in the context of changing climate scenarios.

Activities/ Action Plan.

- Formulation of the flood, drought, landslide protection, and rehabilitation master plans employing both structural and non-structural measures;
- Real-time forecast for disasters by preparing drought and flood frequency forecasting risk maps;
- Development of a preparatory process for protection and rehabilitation operations prior, during and after disasters;
- Vulnerability mapping at different scales ranging from panchayat to river basin; and
- Organization of training programmes to all the stakeholders for protection and rehabilitation.

Technology

Technology has an important role in sustainable water management. At present, most of the technologies are used for treatments and distribution of water, disposal of wastewater, sewage treatment and treatment of industrial effluents. In most cases, these technologies are energy-consuming and adversely impact our environment. Green technologies are being promoted in various countries to ensure human well-being as well as to preserve the environment. According to the United Nations Environment Programme,

“green technology covers a broad area of production and consumption technologies. The adoption and use of green technologies involve the use of environmental technologies for monitoring and assessment, pollution prevention and control, resource and energy recovery, mitigation of climate change and remediation and restoration”.

To mitigate water pollution, these technologies are used in a broad range of scales from households to the industry level. Some of the areas where technologies are used in different countries cover the treatment of rainwater, storm water treatment, artificial groundwater recharge, wastewater reuse, green technology for industrial waste water use, construction of wetlands for wastewater treatment, biological treatment and nutrient removal, technology for nitrogen removal and water recycling and pollutant removal by biomass-based adsorbents.

In Kerala, there is scope for using technology for the treatment of waste and wastewater, industrial effluents, and sewage. Application of technology is also required for increasing efficiency of water use in irrigation, water-saving technology at the household level, and sewage management.

Application of GEOMATICS is necessary to record water distribution systems especially in the urban areas, where underground sewage drainage lines and drinking water pipes are placed side by side. To combat loss of water during transmission and to control contamination, regular monitoring using GIS software will be useful. Digitisation of all drainage system will also be useful for storm water management and urban flood control.

Learning lessons from unique initiatives on watershed management

Kerala has the distinction to have various inventiveness in different fields. New ideas are appreciated and people are enterprising enough to adopt them. Water management is one such sector, where a number of initiatives undertaken by the government, science and technology institutes, and local self-governments have produced significant results, particularly in the sphere of watershed management. Many of these programmes provide important lessons, which

through proper scientific analysis may be replicated, up-scaled, and dovetailed into the larger planning process of the State.

The first successful and complete watershed master plan was prepared by Perambra block panchayat in Kozhikode in 2000. In 2004, a model watershed master plan for Thirurangadi block panchayat in Malappuram was prepared by the Centre for Earth Science Studies. There were successful water harvesting mechanisms developed in the Film Video Park, KINFRA at Kazhakuttam, Chadayamangalm Block under Hariyali projects, and similar initiatives in Palakkad. With assistance from CWRDM, Perumanna grama panchayat in Kozhikode took the lead becoming the first panchayat to declare a water policy on the lines of the State government's water policy declared in 2008. Kerala State Land Use Board also initiated watershed management/water conservation projects in different parts of the State.

Recent initiatives undertaken by the Nedumangad block panchayat and the Kattakkada and Taliparamba assembly constituencies to prepare watershed management plan are noteworthy attempts. It addresses several challenging issues and provides a model programme at the block panchayat level. KILA and Haritha Keralam Mission are instrumental in executing several watershed management projects at the panchayat level. Attempts are taken to document some of the best practices. There are also initiatives in Kannur and Wayanad districts.

Detailed scientific evaluation of all these projects is necessary to learn the lessons. All these projects are successful from the participation point of view. However, some questions like the quantum of water additionally harvested, the status of soil moisture, accrued benefit due to enhanced water resources and the process and method of equitable distribution of additional water warrant more discussion.

Lessons from the Alappuzha canal cleaning project

The Alappuzha town received international acclaim due to its success in decentralised waste management. The Clean Home Clean City campaign introduced in 2012 was a successful intervention to tackle the solid waste crisis involving students and local people. This was followed by a programme of cleaning canals in the Alappuzha town concentrating on the Vadai canal and the Commercial Canal. The IIT Mumbai, College of Engineering, Kuttanad and the Kerala Institute of Local Administration (KILA) extended support.

The programme began with a detailed inventory of the canals, the status of waste generated at households, water quality analysis, waste management in commercial and industrial establishments, and pilot interventions. Recommendations following this analysis covered technical solutions for canal network, solid waste management, liquid waste management, water quality and public health, environmental regulation of industries and commercial establishments, and utility of canals and institution building. The pilot intervention project had encouraging results. The CDD has proposed an integrated approach to the rejuvenation of the Municipal Colony Canal and a plan has been drawn up. Several lessons can be learnt from this initiative. The scaling up of the programme and its sustainability is a question for the future. The urban water bodies infested with 'urban river syndrome' can consider initiating such programmes and set up appropriate community institutions.

River rejuvenation

Kerala has accorded high priority on river restoration as part of Haritha Keralam Mission programme. The campaign titled 'Now, Let Me Flow' covered both urban and rural areas.

Around 2035 km length of rivers was covered under 739 segments. Around 62 per cent of all segments were less than 2 km in length. This programme covered all the 14 district and 1034 LSGIs. Over 1.62 lakh volunteers participated in this campaign. Restoration plans and field level activities were developed in collaboration with LSGIs. As a campaign to generate awareness and people's participation, this programme was successful.

However, it is now important to scientifically investigate the river stretches including hydrological and geomorphological characteristics to devise lasting solutions. Proper documentation in cadastral scale map and digitisation of those maps are necessary for planning purposes. It is important to link such initiatives with river bank mapping and sand auditing programmes.

River Bank Mapping and Sand Auditing

At the instance of the Government of Kerala, the programme on river bank mapping and sand auditing began in 2012. The objective of this programme was to map bank characteristics of all major rivers in the State and assess river bed deposits in order to regulate sand mining from the river beds. Data have been generated at the cadastral scale. So far, 20 rivers have been covered. These data can be used for the river rejuvenation programme, which is one of the activities under river basin management.

CHAPTER 6.1

BRIDGING THE INFRASTRUCTURE DEFICIT

1 INTRODUCTION

Kerala has the third highest population density in India at 859 per sq.km as against national average of 382. It is only bound to increase with return Malayalis and the increased flow of the guest workers in the state. Further, Kerala is the state wherein the urbanisation is taking at a faster rate with nearly half of its population live in cities and conglomeration. The urban population in the state is growing at a faster rate. During 2001-2011, Kerala experienced an urban population growth rate of 92.72 per cent. More over, three of the ten fast growing cities are also in Kerala – Kollam, Kozhikode and Ernakulam. In order to catch up this process, Kerala has to enhance its infrastructure landscapes. During the 13FYP, Kerala has already invested heavily in infrastructure and has taken long lasting policies to scale up its modern infrastructure – roads, transport, solar energy, e-mobility, inland navigation and so on – to make infrastructure deficit history. Yet it is not free from fresh challenges.

Infrastructure may be broadly divided into three eco-systems: technological/physical, financial and social. Technological/physical primarily consists of a range of transport and allied network (roads, railways, aviation, waterways and major and minor ports), electricity, irrigation, telecommunication, housing and water supply. While social infrastructure include schools, hospitals etc. and the category of financial infrastructure includes various components such as remittances, credit-deposit ratio in a particular region and so on. As the technological and physical infrastructure contribute to economic growth and employment, this chapter is focussed on such aspects alone.

2 OVERVIEW OF TRANSPORT INFRASTRUCTURE DEVELOPMENT IN KERALA

The present transportation system in the state was evolved by a piece-meal process, which remained under-connected and non-integrated for about three or four decades since independence, but moving in a positive direction due to the concerted effort from all departments. Still, it is characterised by high operating cost, inefficiency and elevated crash risk. Kerala will continue to stay as a consumer market for all kind of goods. The existing transport system will not be able to cater to this much demand. Hence, inter-modal distribution of goods transport, high quality urban transport infrastructure, more efficient public transport system, scientific management of traffic and improved associated amenities etc. should be targetted.

Transport and related infrastructure play a pivotal role in the economic growth and development of any region. Transportation development should aim at achieving a safe, efficient and economic system for moving people and goods with minimum cost, desirable speed, low carbon emission and maximum comfort level. The provision of quality and efficient infrastructure services is necessary in order to realise the full potential of the economy's growth impulses. The transport system is continuously evolving in time and space and can be seen as a deciding factor for economic development and growth. Thus, transport is important for the efficient functioning of the economy, putting together the inputs used in the manufacture of goods and services and supplying outputs from the production process to consumers. Investment in transport networks can have direct influence on the functioning of the labour markets, efficiency and competitiveness. They may also have an effect on the environment, the quality of life and the overall livability of cities and towns. Improvements in transport connectivity, powered by increased network capacity, reduced travel times and cost, along with improved network reliability, lead to improved productivity.

Transport infrastructure comprises of basic facilities and services that are necessary for carrying out economic activities. The co-existence of multi-modal transport in Kerala mandates that development activities should concentrate on significant infrastructures such as highways, railways, waterways, airways, telecommunication systems and other allied sectors.

Roads: Roads play a prominent role in public transportation vis-à-vis other modes of transportation owing to the geographic peculiarities of Kerala with a comparatively lesser rural-urban divide and limited geographical area of 38,863 sq.km. Total road length in Kerala in 2018-19 is 2,73,113 km. The road traffic is growing at an average rate of 10 to 11 per cent every year, creating pressure on the road network. Road density in Kerala is 398 km/100 sq.km, which is roughly three times the national average. The length of road per lakh population is 686.55 km, and almost 90 per cent of the road network is single lane. The motorable traffic uses the arterial and sub-arterial roads consisting of National Highways (7 percent), State Highways (20 percent) and Major District Roads (73 percent) which are under the administrative control of State PWD. The maintenance and upkeep of these highways are far from satisfactory and devoid of any scientific pavement maintenance or bridge management system.

Road Transport: Although road transport dominates the transportation scenario in Kerala, people depend on railways for long-distance transport needs. The motor vehicle population in Kerala, which was around two lakhs in 1980, increased to about 1.33 crores in 2019. Kerala has a total fleet of 25,186 buses; of which 19,496 are private buses (77.4 per cent) and 5690 buses belonging to Kerala State Road Transport Corporation (KSRTC) comprising 22.6 per cent of the total fleet. A major chunk of this is operated in urban areas causing traffic chaos and congestion.

Rail: The present rail transport system in the state is over-utilised to its capacity in the case of passenger transport. There is already excess demand resulting in long queues and associated discomfort in travel. The state has a rail network of 1,257 km route length with a total track length of 1,588 km, operating under the control of Palakkad and Thiruvananthapuram Railway Divisions and covers 13 railway routes. The average speed of Express trains running in the state is below 60 km/hour.

Airport: Kerala has four international airports viz., Thiruvananthapuram, Kochi, Kozhikode and Kannur. All civilian airports functioning in the state are international airports, a feature unique to Kerala. Thiruvananthapuram international airport is one of the major airports in south India. It plays a major role in the world aviation map, connecting and controlling about nine international air-routes and eight domestic air-routes and provides approach control service to eight major and minor aerodromes. Kozhikode International Airport is the twelfth busiest airport in India and the third in Kerala.

Port: Transportation by coastal shipping is the mode for most bulk commodities and long hauling traffic. Kerala has the advantage of 585 km coastline through which bulk cargos can be transported using multi-modal transshipment points along the coastline. Kerala has one major port at Kochi, 17 minor ports and an upcoming international shipping terminal at Vizhinjam. Out of the 17 minor ports in Kerala, four are considered intermediate ports viz., Vizhinjam, Beypore, Azhikkal and Kollam based on berthing, cargo handling and storage facilities available. However, the development of the Port sector in the state has been hampered to some extent by the constraints of port and logistic capacity, customs procedure and labour problems.

Inland water transport: Inland water transport (IWT), once dominant in the state from north to south, was relegated to the background with the advent of faster motor transport. But, the IWT system is still working efficiently in the backwaters of central and south Kerala. It is the most fuel-efficient and environment-friendly transport mode. This mode is now mostly used for ferry and tourist transport. There is about 1,687 km. of waterway route network in the state consisting of the National Waterway No. 3 from Kollam to Kottapuram, maintained by Inland Waterways Authority of India, and other feeder canals maintained by the State Irrigation Department. State Water Transport Department (SWTD), Coastal Shipping and Inland Navigation Department (CSIND) and Kerala Shipping and Inland Navigation Corporation (KSINC) are the major agencies under IWT in Kerala. The development of State Waterways is done jointly by CSIND and Kerala Waterways and Infrastructure Ltd (KWIL), a Special Purpose Vehicle formed by the State Government and Cochin International Airport Ltd (CIAL) as a major partner.

MRTS: Realising the advantages of the mass transport system in meeting the intracity commuter needs of major cities, GoK has embarked on Metro Rail Project for Kochi. With the introduction of Mass Rapid Transit System (MRTS), major urban corridors are expected to be decongested in these cities for which, the action is yet to materialise. Kochi Metro Rail Project (KMRL) is implemented through the Kochi Metro Rail Ltd (KMRL) which is an SPV jointly owned by the GoK and GoI through equity participation. The number of

passengers carried increased from 100.71 lakh to 126.25 lakh in 2018-19, shows 25.54 per cent increase in passenger travelling. Kochi metro is currently operational between Aluva and Pettah covering a distance of 25.612 km with 22 stations under Phase 1. Light Metro Rail Project is a Mass Rapid Transit System (MRTS) proposed to be implemented in the cities of Thiruvananthapuram and Kozhikode through an SPV, Kerala Rapid Transit Corporation Limited (KRTL).

3 INVESTMENTS BY THE PUBLIC AND PRIVATE SECTOR

Transport related investments in Kerala are powered by the Public Sector, Public Private Partnership and Private Sector. To mobilise funds and to acquire capital for the development of infrastructure facilities, the Kerala Infrastructure Investment Fund Board (KIIFB) has been restructured to act as the key Special Purpose Vehicle (SPV). In order to avoid procedural delay, to encourage external funds, to have an instant response to the current needs, to implement large-scale projects and to encourage public-private partnership for vital/significant projects, state PWD formulated different SPVs and project offices within the department. Kerala Infrastructure Investment Fund Board (KIIFB) is an SPV under finance department for mobilising and channelling funds to various infrastructure SPVs and thereby assure the accelerated investment in infrastructure for ensuring sustainable growth in the economy. For strengthening of research and developments in the road sector, Kerala instituted different research centres such as NATPAC, KHRI, TRC at CET, DRIQ Board etc. Transport activities in road sector are carried out by KSRTC, Motor Vehicles Department (MVD), Kerala Road Safety Authority and Unified Metropolitan Transport Authority (UMTA) in the State and their capacity augmentation is vital to the improved functioning of the sector.

4 GROWTH OF TRANSPORT NETWORK AND DEMAND

The major road network of Kerala, though well connected, faces severe constraints due to the urban sprawl and the haphazard ribbon development all along the routes. The existing traffic levels at most stretches are excessive and beyond the road capacity. The motor vehicle population in the state is increasing in an alarming way with 10 lakh vehicles per year. The route length of the railway remained the same in the last 20 years. Growth of the overall transport network in the state remains almost constant. Due to population growth, urbanisation and the demand for personal modes of transport, the situation is likely to deteriorate in the future. Over the years, the traffic demand has outpaced the rate of investment in urban transport infrastructure.

The National Highways, considered to be the primary network, carries 40 percent of the total traffic, and the State Highways and Major District Roads (MDRs) – the secondary road network – carries another 40 percent of the road traffic. Traffic has been growing at a rate of 10 to 11 percent every year, resulting in excessive pressure on the roads of the state. Thus less than 10 percent of the road network handles almost 80 percent of the total traffic.

The major development indicators of transport sector in the state since 2011 are given in **Table 1**

Table 1 Major Development Indicators of Transport Sector from 2011-2019

Sl. No.	Item	Unit	2011	2012	2013	2014	2015	2016	2017	2018	2019	*Index
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Road Length (PWD)	km	23,242	31,812	31,812	31,812	31,812	31,812	31,812	31,812	31,812	36.9%
2	Motor Vehicles	(nos)	5,397,652	6,072,019	6,870,354	8,547,966	9,421,245	10,171,813	11,030,037	12,042,691	13,334,984	147.1%
3	Buses owned by KSRTC	(nos)	5,402	5,741	5,803	5,860	5,629	5,686	5,953	5,635	5,690	5.3%
4	Railway route length	km	1,199	1,257	1,257	1,257	1,257	1,257	1,257	1,257	1,257	4.8%
5	Boat/Junkars operated by SWTD	(nos)	81	92	95	97	95	98	98	60	63	-22.2%
6	Route Distance by SWTD	km	6,730	6,890	6,890	6,890	6,890	6,890	6,890	6,890	6,890	2.4%

Source: Various Departments. ***Index:-** Index is based on percent growth rate from 2011 to 2019

5 PROFILE OF TRANSPORT SECTOR

Railways: The Railway line runs throughout the length of the state of Kerala, connecting most of the major towns and cities except those in the highland districts of Idukki and Wayanad. Kerala occupies a significant position on the Indian Railways map with 1,257 route km and 1,588 km of total track and about 200 railway stations. Thiruvananthapuram and Palakkad divisions of the Southern Railways are the administrative divisions. Palakkad Division has a total route length of 577.74 km. Palakkad Division operates 99 mail/express and 60 passenger trains and 64 freight trains. Thiruvananthapuram division has a total route length of 623 km. It operates about 170 mail/express/passenger trains and 8 goods trains per day. All the railway lines passing through the State have been converted into broad gauge. There are about 200 railway stations in the State (95 under Palakkad Division and 105 under Thiruvananthapuram Division). In 2018-19, electrified rail route under Thiruvananthapuram Division is 1,197 km and received a revenue earnings of ₹1,703.67 crores. Doubling and electrification works are in progress in various parts of the State. Feasibility studies for some new lines are also underway in the rail sector.

Annual originating passengers for the year 2018-19 for Thiruvananthapuram Central Railway Station was 1.43 crores, which was followed by Kozhikode Railway Station (1.04 crores) and Ernakulam Railway Station (0.93 crores). The freight movement in 2017-18 for Thiruvananthapuram Division was 4.11 million tonnes against 3.197 million tonnes in 2016-17. The freight traffic got a record earning of Rs 466.41 crore in the financial year 2017-2018 and with a hike of Rs 115.51 crore.

With the doubling and electrification between Thiruvananthapuram and Kanyakumari (86.56km) and construction of Vizhinjam seaport, a significant impact on the freight movement from Thiruvananthapuram Railway Division is anticipated.

Roadways: Roads in the state are owned and maintained by mainly three departments/ agencies such as National Highway Authority of India (NHAI), PWD and LSGD. Harbour Engineering Dept., Irrigation Dept., Forests, Railways etc., also constructs and maintains some of the roads in the state.

The total length of the road network in Kerala is 2,73,113 km with a high road density of 398 km / 100 sq.km against the national average of 74.9 km/100 sq.km. About 80% of road length are maintained by Local Self-Government Department (LSGD). 11 National Highways in Kerala with a total length of 1781 km, which carries about 40% of the road traffic in Kerala, has grown at a rate of only 2.2% over the last sixty years. State Highways and Major District Roads (MDRs) with a length of 24975 km constitute around 12% of the total road network and carrying nearly 80% of the total road traffic.

The major road network of Kerala, though well connected, faces severe constraints due to the urban sprawl and the haphazard ribbon development all along the routes. The existing traffic levels at most stretches are excessive and beyond the road capacity. The traffic on roads is steadily increasing at a rate of 12 to 14 percent a year. Capacity augmentation of existing roads is beset with problems relating to limited right of way and land acquisition.

THE EXISTING ROAD NETWORK HAS TO UNDERGO A QUALITATIVE IMPROVEMENT WITH THE AIM TO REDUCE TRAFFIC CONGESTION AND DELAY, EASY ACCESS TO DESTINATIONS AND REDUCTION IN ACCIDENT RISKS. MOST OF THE PWD ROADS HAVE TO UNDERGO MASSIVE UPGRADATION WITH WIDENING AND INCORPORATING ROAD SAFETY FEATURES. THERE IS A NEED TO UNDERTAKE FUTURISTIC DEVELOPMENT OF STATE HIGHWAYS, IMPORTANT MDRS AND CITY ROADS IN THE STATE, THROUGH GEOMETRICAL IMPROVEMENT, JUNCTION IMPROVEMENTS, COVERING PEDESTRIAN

FACILITIES, UTILITY DUCTS, RE-LAYING THE ROADS INCORPORATING TECHNICAL CORRECTIONS AND ENTERING INTO MAINTENANCE CONTRACTS. ROADSIDE PARKING IS ANOTHER ISSUE TO BE ADDRESSED TO IMPROVE THE LEVEL OF SERVICE.

Four laning of NH66 is being planned in stages are at different phases of implementation. Kollam bypass which is completed and Alappuzha bypass, nearing completion, on the NH 66, implemented on a cost-sharing basis between Central and State Governments, significantly reduce traffic time for long-distance travel.

THE COASTAL HIGHWAY WHICH COVERS 654 KILOMETRES FROM MANJESWARAM IN KASARAGOD TO POOVAR IN THIRUVANANTHAPURAM, PASSES THROUGH 9 DISTRICTS AND IS UNDER IMPLEMENTATION. IT PROVIDES CONNECTIVITY WITH MAJOR PORTS SUCH AS VALLARPADAM, VIZHINJAM AND KOLLAM. THE ESTIMATED COST OF COASTAL HIGHWAY, WHICH IS AROUND ₹6,500 CRORE, IS BEING FINANCED FROM THE KERALA INFRASTRUCTURE INVESTMENT FUND BOARD (KIIFB).

THE PROPOSED HILL HIGHWAY ENVISAGES THE DEVELOPMENT OF THE MUCH NEEDED NORTH-SOUTH CORRIDOR THROUGH THE HILLY REGIONS BY UPGRADING/IMPROVING THE EXISTING NETWORK OPTIMALLY IS ALSO IN THE EARLY STAGES OF IMPLEMENTATION. THE ALIGNMENT OF HILL HIGHWAY PASSES THROUGH ALL DISTRICTS OF KERALA EXCEPT ALAPPUZHA. KERALA ROAD FUND BOARD IS THE DESIGNATED SPV OF THIS PROJECT, WHICH IS ALSO FUNDED BY KIIFB.

AS PART OF THE REBUILD KERALA INITIATIVE (RKI), THE KERALA STATE TRANSPORT PROJECT (KSTP) HAD UNDERTAKEN RECONSTRUCTION/RESTORATION OF THE ROADS DAMAGED DUE TO THE FLOODS AND LANDSLIDES IN 2018 AND TO MAKE THEM TRAFFIC WORTHY.

MAJOR EMPHASIS SHOULD BE GIVEN TO WIDENING THE STATE HIGHWAYS AND MDRs WITH PROFESSIONAL DESIGN AND ADEQUATE DRAINAGE FACILITIES AS PER STANDARDS AND GUIDELINES. THE ABOVE MENTIONED ROAD DEVELOPMENT INITIATIVES LIKE THE NATIONAL HIGHWAY FOUR LANING, HILL HIGHWAYS, COASTAL HIGHWAYS, BYPASSES, CAPACITY AUGMENTATION OF OTHER ROADS ETC. NEED TO BE COMPLETED AT THE EARLIEST.

Road Transport: Vehicle population is growing at a Compound Annual Growth Rate (CAGR) of 10.8% and the passenger traffic is 12,000 Billion Passenger Kilometer (BPKM). Growth of the traffic in Kerala is far greater than the growth of highways resulting in capacity saturation. Freight traffic is growing at an annual rate of 9.7 % and is expected to be 13,000 BTKM by 2032.

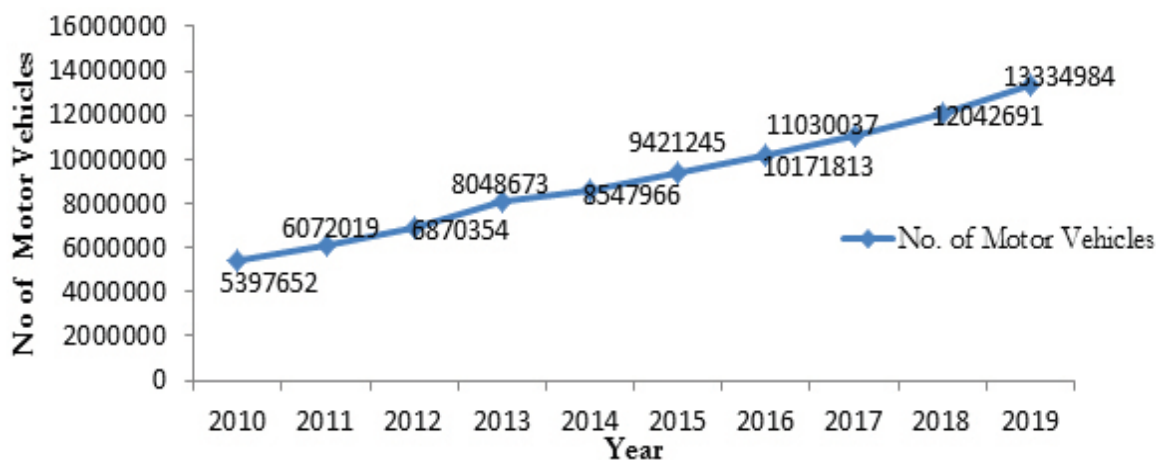
As on March 2019, 133.34 lakh motor vehicles were registered in Kerala with a compounded annual growth rate of above 10% for the last two decades. Number of vehicles per 1,000 populations for Kerala as on March 2018 is 383, which is far ahead of China and at par with developed countries. Growth of vehicle population in Kerala is 10.7% in 2018 -19 over the previous year.

In 2019, 41,111 road crashes were reported in Kerala, resulting in 4,440 deaths and 46,055 injuries. NATPAC, in 2019, has identified 340 priority crash black-spots in the state of which 221 crash black-spots were on the NHs, 80 on SHs and 39 on Other Roads.

Kerala has a total fleet of 25,186 buses (offering public transport), of which 19,496 are private buses (77.4 percent) and 5690 buses belonging to Kerala State Road Transport Corporation (KSRTC) comprising 22.6 percent of the total fleet. Road freight services are wholly owned and operated by the private sector.

THE GROWTH OF THE VEHICLE POPULATION IN KERALA IS 10.7 PERCENT OVER THE PREVIOUS YEAR. THE GROWTH OF MOTOR VEHICLES DURING THE LAST TEN YEARS IS SHOWN IN FIGURE 1.

Figure 1: Growth of motor vehicles since last ten years



Source: Motor Vehicles Department, GoK

THE NUMBER OF MOTOR VEHICLES HAVING VALID REGISTRATIONS AS ON MARCH 31, 2019 IS 1,33,34,984 AS AGAINST 1,20,42,691 IN THE PREVIOUS YEAR. PERSONAL VEHICLES HAVE RECORDED A FASTER GROWTH RATE OVER THE PREVIOUS YEAR. THE LACK OF EFFICIENT AND AFFORDABLE PUBLIC TRANSPORT HAS RESULTED IN A DRAMATIC INCREASE IN PRIVATE OWNERSHIP OF VEHICLES, ESPECIALLY TWO-WHEELER VEHICLES, RESULTING IN NOISE AND AIR POLLUTION.

THE MISMATCH BETWEEN GROWTH IN MOTOR VEHICLES AND THE CAPACITY AUGMENTATION OF ROADS HAS RESULTED IN INCREASING TRAFFIC CONGESTION AND ROAD ACCIDENTS THROUGHOUT KERALA. MOST OF THE ROADS IN THE STATE DO NOT

HAVE ADEQUATE WIDTH TO ADDRESS THE EXISTING LEVEL OF TRAFFIC, ONLY ONE-FOURTH OF THE ROADS HAVE EITHER TWO LANES OR FOUR LANE CAPACITY WHILE MOST OF THE ROADS HAVE SINGLE LANE OR INTERMEDIATE LANE CAPACITY. IN THE CASE OF NATIONAL HIGHWAYS, ONLY ABOUT 12 PERCENT OF THE ROADS HAVE FOUR LANE CAPACITIES WHILE THE REMAINING ROADS HAVE ONLY TWO LANES OR INTERMEDIATE LANE CAPACITY. BULK OF THE INTER-CITY AND INTERSTATE TRAFFIC IS CARRIED OUT BY THE NATIONAL AND STATE HIGHWAYS, WHICH ARE ONLY 8 PERCENT OF THE TOTAL NETWORK. CONSIDERING THE DEMAND-SUPPLY GAP, THERE IS A HUGE NEED FOR UP GRADATION OF THE EXISTING ROAD NETWORK.

KSRTC IS THE SINGLE LARGEST PUBLIC SECTOR UNDERTAKING, CARRYING OUT PASSENGER TRANSPORT OPERATIONS IN THE STATE. THE GROSS REVENUE EARNING OF KSRTC INCREASED FROM ₹2,006.37 CRORES TO ₹2,277.00 CRORES IN 2018-19. THE GROSS REVENUE EXPENDITURE IN 2018-19 IS ₹2554.00 CRORES COMPARED TO ₹2,621.00 CRORES IN 2017-18 AND OPERATING LOSS IN 2018-19 PERIOD IS ₹227.00 CRORES COMPARED TO ₹614.93 CRORES IN 2017-18. THE AVERAGE EARNING PER VEHICLE PER DAY ON ROAD OF THE CORPORATION HAS INCREASED FROM ₹11,872 IN 2017-18 TO ₹13,450 IN 2018-19.

FINANCIAL PERFORMANCE OF KSRTC IS NOT IN TUNE WITH ITS PHYSICAL ACHIEVEMENTS DUE TO INCREASE IN OPERATING EXPENDITURE, HIKE IN SOCIAL COMMITMENTS TO ITS EMPLOYEES, INCREASE IN INTEREST PAYMENTS, OPERATION IN UNECONOMIC ROUTES AND THE GRANTING OF CONCESSIONAL TRAVELS LEADING TO INCREASING LOSSES FOR THE CORPORATION. HEAVY LOSSES DUE TO OPERATIONAL INEFFICIENCY, HIGH BUS/STAFF RATIO, OPERATION IN UNECONOMIC ROUTES AND UNVIABLE DEPOTS ARE SOME OF THE ISSUES/CHALLENGES FACED BY KSRTC.

KERALA HAS SET AN AMBITIOUS TARGET OF 10 LAKH ELECTRIC VEHICLES BY 2022 AND FULLY ELECTRIFYING ALL CLASSES OF MOTOR VEHICLES BY 2030. THE KERALA STATE ELECTRICITY BOARD LTD (KSEB) HAS ALREADY ANNOUNCED ITS PLAN TO SET UP ELECTRIC VEHICLE (EV) CHARGING STATIONS ACROSS THE STATE, ESPECIALLY IN THIRUVANANTHAPURAM, KOCHI AND KOZHIKODE IN THE FIRST PHASE. THE KSEB HAS IDENTIFIED 52 PLACES FOR SETTING UP PUBLIC CHARGING STATIONS- THIRUVANANTHAPURAM (18 LOCATIONS) FOLLOWED BY KOCHI (17 LOCATIONS) AND KOZHIKODE (16 LOCATIONS).

Ports: Kerala has a coastal length of approximately 585 km. There is one major port at Cochin and 17 non-major ports. Out of 17 minor ports in Kerala, four are considered as intermediate ports based on berthing, cargo

handling and storage facilities available in them. They are Vizhinjam, Beypore-Kozhikode, Azhikkal and Kollam ports. Ports are being developed on a priority basis for coastal shipping operations.

COCHIN PORT IS ONE OF THE MAJOR PORTS IN INDIA SITUATED IN KERALA. THE PORT LIES IN TWO ISLANDS, NAMELY WILLINGTON AND VALLARPADOM. COCHIN PORT RECORDED THE HIGHEST GROWTH RATE IN HANDLING OF CARGO IN 2018 AND 2019 AMONG THE MAJOR PORTS IN INDIA. THE TOTAL CARGO TRAFFIC HANDLED BY THE COCHIN PORT IN 2018-19 WAS 32.02 MMT AS AGAINST 29.39 MMT IN 2017-18, WHICH SHOWS AN INCREASE OF 9 PERCENT OVER THE PREVIOUS YEAR. IN 2018-19, 49 INTERNATIONAL CRUISE SHIPS VISITED IN COCHIN PORT WITH 62,753 PASSENGERS AND 28,828 CREW MEMBERS. THE TOTAL CARGO TRAFFIC HANDLED BY THE COCHIN PORT IN 2018-19 WAS 32.02 MMT AS AGAINST 29.39 MMT IN 2017-18. THIS SHOWS AN INCREASE OF 9 PERCENT OVER THE PREVIOUS YEAR. HELICOPTER SERVICE WAS INTRODUCED FOR CRUISE TOURISTS IN KOCHI PORT FROM WILLINGTON ISLAND. COCHIN PORT IS ONE OF THE WELL SOUGHT AFTER TOURIST DESTINATIONS IN INDIA. IN 2018-19, 49 INTERNATIONAL CRUISE SHIPS VISITED IN COCHIN PORT WITH 62,753 PASSENGERS, AND 28,828 CREW MEMBERS. HELICOPTER SERVICE WAS INTRODUCED ON NOVEMBER 21, 2019 AND IT IS AIMED TO OPERATE TO DESTINATIONS LIKE MUNNAR, JATAYU EARTH CENTRE, ETC.

THERE ARE 928 VESSELS REGISTERED AT VARIOUS PORTS OF KERALA (FROM 2010 TO NOVEMBER, 2018) I.E, VIZHINJAM (301), KOLLAM (32), ALAPPUZHA (292), KODUNGALLUR (237), AZHIKKAL (34) AND BEYPORE (32). MORE REGISTRATION OF VESSELS IS DONE AT VIZHINJAM FOLLOWED BY ALAPPUZHA. THE DEEPWATER INTERNATIONAL CONTAINER TRANSHIPMENT TERMINAL AT VIZHINJAM WHICH IS UNDER CONSTRUCTION, IS PROPOSED TO HANDLE VESSELS UP TO 8,000 TEUS IN THE INITIAL PHASE AND UP TO 12,000 TEUS IN THE FINAL PHASE.

Civil Aviation: Kerala is the only state featured with four operational International Airports viz. Thiruvananthapuram, Cochin, Calicut and Kannur. Unlike other States, where the capital city has the highest air traffic, in Kerala, air traffic is distributed evenly over the four airports. Despite this, three international airports of Kerala are among the top 15 busiest airports in India. More than eight lakh domestic passengers and 50 lakh international passengers are using these airport facilities in the state every year. Some of the prospective projects in the pipeline are Heli Taxi Service, Air Kerala, Air Strips, Kerala Sea Plane, Air Ambulance etc.

Inland water transport: Inland water transport is the most economical and environmental friendly mode of transport. The Central Government declared, a length of 168 km of Waterway from Kollam to Kottapuram of West Coast Canal including 37 km length of Udyogmandal and Champakara Canals as National Waterway No. 3 with effect from 1993 and has been extended up to Kozhikode in 2016. In 2019-20, around 5.46 lakh tones of cargo were moved through National Waterway-3. State Water Transport department transports about 130.48 lakh

passengers per annum using wooden/steel and fibre glass passenger boats. Presently 54 passenger boats and 5 rescue boats are operated, including tourism services.

Investment in Transport Sector: An amount of ₹1,45,432 lakh was provided as outlay in 2018-19 for the roads and bridges sector and the expenditure reported in that period was ₹2,26,061.00 (155.44 percent). An amount of ₹9,115.00 lakh was provided as outlay in 2018-19 for the road transport sector and the expenditure reported in that period was ₹2,077.88 lakh (22.80 percent). In 2019-20, the outlay earmarked for Roads and Bridges Sector and Road Transport was ₹1,36,713 lakh and ₹10,243 lakh. The corresponding expenditure reported was ₹95,456.09 lakh and ₹408.19 lakh respectively.

The outlay and expenditure in the transport sector in the Annual Plan 2018-19 and 2019-20 (expenditure up to September 2019) are given in **Table 2**.

URBANISATION: RISING URBANISATION IS A NATURAL PHENOMENON AND HAS POSITIVE EFFECTS ON ECONOMIC DEVELOPMENT, CONSIDERING ALL OF ITS CONSEQUENCES. PLANNING OF TRANSPORT MUST GO HAND IN HAND WITH LAND USE PLANNING. IN THE ABSENCE OF SUFFICIENT URBAN TRANSPORT SERVICES, TRAVEL TIMES AND TRAVEL COSTS FOR BOTH PASSENGER AND GOODS TRAFFIC ARE INCREASED.

In Kerala, the population is increasing with an average decadal growth rate of 15%, and the current growth rate is 4.86%, i.e. the population growth rate shows a decreasing trend. Also, the percentage of urbanisation increases with a very narrow difference in the rural and urban population. **Table 3** shows the population indicators of Kerala.

Table 2. Outlay and expenditure in the transport sector in the Annual Plan 2018-19 and 2019-20, in ₹ lakh

Sl. No	Sub Sectors	Annual Plan 2018-19			Annual Plan 2019-20		
		Budgeted outlay	Expenditure	Expenditure percent	Budgeted outlay	Expenditure*	Expenditure Percent*
1	Port Department	12642	16117	127	11006	2964	27
2	Roads and Bridges	145432	226061	155	136713	95456	70
3	Road Transport	9115	2078	23	10243	408	4
4	Inland Waterways	12938	3940	30	13145	1621	12

**Up to September 2019*

Table 3. Population and GSDP of Kerala

Sl. No.	Item	Units	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2016-17	2017-18	2018-19
3	Total Population	(in 000s)	13549	16904	21347	25454	29099	31844	33406		
4	Rural Population	(in 000s)		14351	17880	20682	21618	23574	17471		
5	Urban Population	(in 000s)		2552	3467	4771	7018	8267	15935		
6	Density of Population	No. Per Sq. km.		435	549	655	749	819	860		
7	Urban Population	Percentage		15	16	19	24	26	48		
8	GSDP	₹Crore	462	1255	3823	12195	63715	180812	485301.54	520578.51	559412
9	Primary Sector (GSVA)	₹Crore	241	653	1682	4756	14017	15966	45936.94	47171.3	46495.43

6 WAY FORWARD

a) Challenges

Progress achieved so far is not at par with the growing demand in the last years. The challenges faced by ongoing projects, congestion, road capacity constraints etc, lead to higher transportation costs, low quality and efficiency. The investments in various modes are massive considering volume and demand looking into tariffs, passenger benefits, amenities and other components, systems and other remodelling to provide efficient economical and green services to address growing demand.

The infrastructure developments in the state in the future need to be based on a comprehensive study and based on the optimum modal share estimated through accounting data, demand, capacity, economy, environmental issues etc. A fully functional core multi-modal transport network is to be identified for the state, and allocation of resources is to be done in adherence with the core transport network. Transport demand and supply will be the key factor for the development of the core transport network, and the infra deficit will be addressed at par with the demand and supply. A transport policy document suggesting the vision and mission of all the subsectors are to be developed for the state, considering all the initiatives presently being undertaken in the transport sector. Development of an urban transport policy is also equally important in Kerala.

There is no proper coordination among service providers of different transport modes. Faced with severe fiscal constraints, the state is not able to allocate adequate resources for Transport infrastructure development. The cities and towns in the state are facing constraints by narrow roads and bridges and poor pavement and drainage conditions. Adequate footpaths, cycle tracks, pedestrian and vehicle crossing facilities, service roads etc. are absent in city roads. Traffic congestion, long queues at junctions, crowded buses, accidents, smoke and noise are the common scene on urban roads. The available road space is further invaded by parking of vehicles, encroachments and other informal activities by street vendors and petty shopkeepers for eking out their livelihood.

b) Interventions based on accessibility based planning

The key factor for providing a desirable level of mobility is to take a holistic, global and integrated view of transportation services and operations. Such an approach will result in a system that is a system of systems, with multiple interfaces and shared information and infrastructure elements. Unless this novel approach of the development plan is adopted, a huge amount of resources will be spent on mode-specific concepts that cannot even handle today's demands, let alone those of the future. The state needs a new, integrated, systems-architecture approach to transportation planning and operations that will maximise public and private-sector investments in meeting both our transportation needs and our societal needs with a focus on following key areas:

- Improvement in transport networks
- Efficiency in productivity and economy in transport
- Improved quality of services
- Green transport and mobility
- Better frequency of reliable services
- Disabled friendly transport facilities
- Rural transport and accessibility
- Reduction in transit/travel times

c) Transport Planning Solutions for the efficient management of the following key areas

- Increased demand-passenger/freight
- Multi-modal management
- Terminal integration
- Logistic services development
- Management of transport assets
- Globalization-its effect on transport demand
- Innovative Technology Adoption
- Integrated transportpolicy

- Energy and environment compatibility
- Database sharing and management
- Financial and material resources optimisation
- Transport Infrastructure development in rural and urban areas

d) Sustainable mobility Goals

Considering the overall aspects of the road transport sector in Kerala, the following Goals are formulated in order to ensure that mobility solutions are sustainable:

- **Goal 1:** Ensure that the urban road structure is organised and suited to the land use
- **Goal 2:** Develop a public transit system(s) in conformity with the land use that is accessible, economical, efficient and effective for the passenger movement. The road density of Kerala is more than the national average, which itself indicates the constraints in capacity augmentation of highways.
- **Goal 3:** Ensure the safety and mobility of pedestrians and cyclists by designing the streets more user friendly
- **Goal 4:** Develop traffic management and engineering solutions that increase safety and optimises the efficiency of the transport network
- **Goal 5:** Ensure that the goods movement in the state is organised and does not interfere with passenger movement to the maximum extent
- **Goal 6:** An overall and integrated policy, therefore, needs to be in place to encourage competitive pricing and coordination between different modes

The performance indicators of the existing transport scenario along with the desirable targets to be achieved are tabulated in Table 4.

Table 4 Existing transport scenario in Urban Areas with desirable targets

Index	Description	Formulation	Existing (range)	Target
Average Speed of Network in Kmph	Average running speed in Kmph	Average Running Speed in Kmph for all vehicles	24 - 30	40
Modal Share of PT (%) (Motorized)	Modal share (%)	Public Transport Trips/Total Study Area Trips	36 - 40	60%
Modal Share of NMT (%)	Modal share (%)	NMT Trips/Total Trips	5 - 16	20
Accessibility	%of work trips with TT<15min	(Work trips with Travel Time less than 15 min/ Total Trips)	8 - 25	40
Walkability (%)	Availability and Usability of footpath	(Footpath length in km /Road length in km) x100	14	50
Cyclability (%)	Availability and Usability of Cycle Track	(Cycle track length in km /Road length in km) x100	0	100
Fatality	Fatal accidents	No of fatalities/lakh population	10 - 27	0

SOURCE: COMPREHENSIVE MOBILITY PLAN STUDY, NATPAC

e) Sectorwise Strategic Plan

The infrastructure requirement in the transport sector to be revisited in the different scenario viz work from home, online shopping etc. A strategic plan (for the next 10 years) that is aligned with the state's requirements is to be developed and translated into operational steps. The transport sector in the state should be better co-ordinated by a single ministry for the better integration of activities. The current trend in the urbanisation will be necessitated mass transport networks in Kerala cities. The national highways, hill highway and coastal highway railway lines and waterway are to be treated as the major transport corridor and the other roads in the state are to be maintained as the feeder links. The sector-wise specific way forward is listed in the following subsections.

Road transport sector

- A road network plan is to be developed and infrastructure projects are premeditated in toeing the line with the network plan.
- Agencies involved in the transport sector are to be merged into three or less for accomplishing an integrated and comprehensive approach to the transport infrastructure development
- Systematic planning and management approach may be followed for the development of the infrastructure project, especially for major infrastructures. A nine-stage sequence, i.e. problem identification - feasibility study - in principle approval - DPR preparation – technical approval – tendering - implementation – quality checks - post-evaluation should be followed for the realisation of infrastructure projects
- Creation of a syllabus and single window for the training of officials
- Utility management by proper mapping and upkeep of utility database
- Quality and milestone-based release of payment for infrastructure projects
- Inclusion of project management module in price software for avoiding cost and time overrun
- Encouragement of public-private partnership in the vehicle testing and licensing, installation of an intelligent traffic enforcement system
- Adopt sustainable technologies in the transportation sector for better tomorrow-adopt recycling, alternate fuel vehicles etc.
- Adopt climate-resilient infrastructure and resilient transportation planning
- Encourage mobility enhancement rather than accessibility
- Integrated approach in the traffic enforcement by police and Motor vehicle department
- Continuous efforts and action plans are required to quash the road crashes

Railway sector

- Existing infrastructure improvement in the railway network in the state by standardising the station facilities, removal of level crosses, automation of the signalling system and improving the track and its fastening system to handle high speeds
- Preparation/Updation of Detailed Project Report for the proposed mass transit system with changes in traffic and transport scenario
- Rail Road coordination to be well planned: the railways should be engaged for long-distance travel and logistics while road transport should be engaged for a short distance
- Roll on - Rollover (Ro-Ro) operation in railway need to be encouraged, and facilities are to be provided
- New railway lines and routes are to be planned by a comprehensive study with due account of optimal modal share
- Capacity augmentation of the railway should be in tune with the demand and supply rather than the entire railway network

Air transport Sector

- Development of airstrips and helicopter taxi services for encouraging tourism sector
- Explore the possibility of private sector participation in the airport modernisation and operation
- Expansion and development of Maintenance, Repair and Overhaul (MRO) hub facilities for market-leading aircraft types in existing international airports
- While considering the new airports, its Impact on existing airports and viability in terms of techno-economic feasibility and environment impact is to be duly accounted
- All future developments should ensure multi-perspective approach and greenfield construction technology
- Possibilities of NABH-Nirman Scheme should be explored to generate scientific proposals for futuristic Airport infrastructure development in the state
- Research and development area need to be strengthened to collaborate with foreign aircraft manufacturing companies

Inland Water Transport Sector

- Comprehensive development of master plan for the waterways in the state, and prioritisation of development activities. Based on the master plan, the cargo potential of waterways are to be explored
- Classification of existing waterways and development of proper standards for each waterway
- Mechanism for close monitoring of waterway development and prevention of activities like encroachment
- Standard operating procedure for waterway maintenance

- External funding including PPP. Encouragement of private participation in waterway management and operations
- Procurement of modern vessels for SWTD and KSINC
- Development of containerisation facilities.
- Establishing connectivity between ports and hinterland
- Development of feeder canals to connect all towns near waterways with the main network
- Sustainable development of IWT in line with Integrated Multimodal Transport Policy
- Plan for houseboats related tourism development, identification of new routes and integration with other tourism options to enhance the potential of existing facilities
- Enhancement of night navigation facilities and policy measures
- Initially, viability gap funding needs to be given at least for 10 years until the infrastructure is fully developed, so that inland water transport is competitive
- The envisaged connection of the tributaries of the rivers through a network of canals will provide an opportunity and an impetus to increase the potential and growth of IWT

Port Sector

- Strengthening of Maritime Board to ease the Port business and to ensure efficient regulation and facilitation of cargo movement.
- Increase and maintain draft depth at ports to attract large vessels and enable them to become hub ports
- Expedite the completion of various projects under Sagaramala, especially those aimed at improving port connectivity, setting up coastal economic zones (CEZs) and establishing new ports
- Create an institutional mechanism for technology adoption in transport, to advance the use of innovation, develop technology and create a skilled interdisciplinary transportation workforce
- Setting up multi-modal logistics parks for addressing the issues related to underdeveloped infrastructure, an unfavourable modal mix and connectivity
- Gradual adoption of international standards for increasing the efficiency and ensure compatibility

f) Vision 2050

The Mobility Vision for transport development in Kerala should be to provide safe, economic, efficient, and environmentally sustainable means of the transportation system for improving the mobility of people and goods by means of an appropriate intermodal integration of transport facilities. In order to provide better mobility in future, the transportation system needs to be integrated, intermodal, inclusive, intelligent and innovative.

Building on this, the vision of an integrated transportation system for the year 2050 is:

- An integrated national transportation system that can economically move anyone and anything anywhere, anytime, on time;
- A safe transportation system without fatalities and injuries; and,
- A transportation system that is compatible with the environment and not dependent on renewable sources of energy

Information technologies are also reshaping our transportation demand. New ways of working, innovative business models, and lifestyle changes are changing our needs for transportation. Some of the options for achieving this mobility vision are:

- Reduce demand for transportation by replacing physical movement with "virtual" movement of people and goods where it is appropriate (telecommuting, e-commerce, etc.)
- Improve system and modal efficiency by providing reliable and seamless transportation options and common, quality information for all modes
- Improve operational management by creating new inter-institutional arrangements – both formal and virtual—often crossing public and private lines to overcome current jurisdictional and sectoral fragmentation
- Develop efficient and effective means for selecting and completing infrastructure projects, especially information infrastructure, that add to transportation system capacity without causing an impact on other important areas of life (land use, the environment, etc.)
- Rationalise system design and operations at a level above the individual modes, to improve the flow of people and goods at intermodal transfer points (sea to rail, land to air, etc.)

- Improve the availability of transportation services by increasing the coverage of feeder connections and by expanding from a hub-and-spoke system to a distributed network for national, regional, and line-haul services

6 SUMMARY AND CONCLUSION

The growth of urban areas in the state has been slightly haphazard, growing around a compact central core with industrialisation and migration, bringing about rapid change in the peripheral land use resulting in urban sprawl. One of the most daunting problems faced by the urban area is an increase in trip times and costs both for passenger and goods traffic. A transport plan cannot be sensibly conceived without a plan for land use. Planning of transport must go hand in hand with land use planning, and each city must involve itself utilising its resources for housing, sewerage, health, education and transport. The existing issues and concerns, the unfinished tasks, the congestion and constraints in the movement leading to higher transport costs will be some of the challenges to face as we look at transport requirements in the near future.

Future volumes of demand will be very high with an increase for railways, roadways, airways and water transport requiring not only massive investments but other actions, covering pricing policies, customer focus, terminal management, safety, transit times, organisational and other changes to provide adequate and efficient services. The expectations of future transport in Kerala includes a holistic approach for improvement in the transport networks, Increase in productivity and economic efficiency in the field of transport, Improvement in quality, reliability and frequency of transport, Enhancement of comfort levels and provision of facilities for the disadvantaged persons, Increase in mobility – first and last mile connectivity for the commuter for their different journeys, Improved customer service, Reduction in transport transit times, Improvement of rural transport and providing accessibility and reduction in crashes and improved safety. The thrust areas of development by different stakeholder departments and agencies include Sustainability, efficient Inter-modal integration, enhanced patronage of public transportation, tie-ups with the private sector for development, Improvements in processes and systems, Adoption of technology innovations etc. As the Indian government's premier think tank, NITI Aayog reports states that it will always strive to think ahead and support the federal and state government's ability to develop, adopt and stay ahead of the curve in green mobility.

Part 2 Sustainable Energy Infrastructure

T. Jayaraman

Introduction and Key Issues:

In this chapter we will discuss some key issues with respect to the electricity sector in Kerala. Though the term energy encompasses other sources as well, the key issues in the short to medium term relate to electricity generation, distribution and consumption. We will briefly mention other forms of energy, in the appropriate context, but will not enter into it in substantial detail.

Power production, in its earlier avatar, was mainly a question of technological feasibility, natural resource endowments to lower costs, and the scale of economic demand. However, in the last few decades, it has also become contentious from the viewpoint environmental concerns. As a result, to some sections of public opinion, a narrow interpretation of environmental sustainability, most appropriately described as "do-nothing" environmentalism, has become the dominant concern over-riding all the other considerations of the earlier era. This interpretation in its original form was characterised by primarily a resolute opposition to all kinds of dam

construction, for whatever purpose, including both power and irrigation. But increasing global concern over climate change has, contradictorily enough, reinforced the importance of hydel power, as a non-fossil fuel source of power, whereas the opposition to power generation is now focused on opposition to coal-based generation. There has of course also been a steady stream of opposition to nuclear power, to the extent that in some developed countries, this has resulted in increased fossil fuel dependence even though nuclear power is also a non-fossil fuel source of power. Navigating this thicket of opposition has become a significant decelerating factor in India's expansion of power generation, though the long-term sluggishness of industrial demand, the lack of capital and the inadequacy of other infrastructure have also been important constraints.

Renewable energy, mainly solar and wind power generation, now occupies centre-stage in the development of power generation. Yet the enthusiasm for renewables, especially due to the rapidly decreasing costs of generation, often ignores the costs that will be incurred in building up the infrastructure required for significantly high levels of renewables in the electricity generation mix. Renewables also require land, and land on the scale required will not be easy to obtain in all regions of the country. All serious studies of India's future energy and power sector development, clearly indicate that fossil fuels will continue to play a significant role well past the half way mark of this century. India cannot afford a commitment to carbon neutrality at an early date, given its development deficits, and in any case it is worth recalling that the commitment to carbon neutrality in the Paris Agreement implies one at the global scale that is by no means equivalent to a country-wise requirement.

In this background, in technological terms, Kerala's power sector has undergone an interesting evolutionary trajectory, not so much in its actual material nature as in the perceptions surrounding it. Kerala's natural energy resource endowment being water, its energy development began with the rapid development of hydro-power. In the early years of the post-Independence era, grid connectivity across the country was low, both in qualitative and quantitative terms, forcing many States in the country to seek self-reliance in power generation. The expansion of hydropower subsequently slowed down as the low-hanging fruit was quickly picked, and further exploitation became increasingly more complex and expensive. At the same time, the national and global debate on the adverse impact of hydel power has had a distinct impact on Kerala, with the result that expansion of hydel power, outside of smaller scale projects, and those already in the pipeline, some of which are extensions or completions of earlier projects, has been the main source of new hydel generation. But while this debate was playing itself out, hydel power has acquired renewed salience in the context of climate change.

At the same time, the development of the power grid across the country, has enabled increasingly reliable purchase of power by power deficit regions from other parts of the country that are power surplus, and local self-reliance is no longer a pressing or even a significant necessity. Thus, Kerala's hydel generation becomes part of the country's commitment to increasing non-fossil fuel generation, while the State's own deficit in power can be met from other regions.

Despite the long-standing public enthusiasm for renewables, Kerala's record has been fairly limited in comparison to other States in the country. The reasons are not far to seek. Given the experience, reach and sheer scale of Kerala's public sector utility, the Kerala State Electricity Board (KSEB), all models of renewable expansion excluding it were bound to fail. Given the structure of Kerala's economy and industrial sector, the expertise and capacities of the KSEB are critical to any kind of technological push in the power sector. The second reason for the limitation is that land availability on the scale of Gujarat, Rajasthan, Maharashtra, Tamil Nadu and Karnataka, is simply not there in Kerala and hence the large-installation model followed by these States has limited reach here.

The other dimension of Kerala's power story is the rapid changes in the governance, regulation and institutional structure of the power sector at the national level. Successive governments at the Centre, irrespective of political affiliation, have insisted on the mantra of privatisation, and have relentlessly required States to follow suit, while Central and State regulatory authorities have driven the process on their part as well. The result is a skewed system where the social costs of power supply are borne by a largely public sector, while the profitable power generation sector has a substantial private presence. At the same time, without the economic fundamentals being sound and as the public distribution companies increasingly come under stress, the power generation sector is also under financial stress eventually. Regrettably, the proposed amendments to the Electricity Act by the Central Government seek to remedy the situation by further tilting the scales in favour of the generation sector, especially the private players.

Kerala has sought over the years to swim against the tide in principled fashion, except where overridden by the economic clout of the Centre or the pressure of regulators. And it has done so with the government receiving strong support from large sections of public opinion in the State. Today, the Government of Kerala is committed to maintaining the dominant position of the public sector in the State's power sector. The Kerala State Electricity Board is unarguably one of India's best performing public utilities in the power sector, on all aspects of its functioning including technical, customer service and financial parameters. In the series of disasters that have affected the State over the last three years, including two major episodes of flood and landslides and the COVID19 pandemic, the KSEB has provided outstanding service to the people of the State in all respects. This includes maintaining the highest possible level of service, undertaking repairs and restoring damage speedily, and providing tariff and related concessions across many different sectors of the economy and the domestic sector, especially during the ongoing COVID-19 pandemic.

Kerala is the first State in the country to attain 100 per cent household electrification. Electricity is being provided throughout the State 24x 7 x 365 without any major or routine recourse to power cuts or load shedding. Having achieved universal electrification, the State is now concentrating on the modernization of the grid to meet the ever increasing customer aspirations with respect to reliability, to attain the lowest level of system losses, to meet the requirements thrown up by decentralized renewable generation, and to ensure safety of installations. In addition to all these, the State has also embarked upon a mission to build a state-of-the-art transmission network by constructing new lines, substations and modernizing existing systems, to be ready for taking in the projected boom in e-mobility. The state has kicked off the

ambitious ‘Oorjja Kerala Mission’ which is a bouquet of five inter-related projects namely, ‘Dyuthi 2021’, ‘Soura’ ‘Filament free Kerala’ ‘Transgrid 2.0’ and ‘e-safe’, woven together as a combination of priorities set by the above aspects. The underlying spirit of all the projects envisaged in the power sector of the State is to contain the challenges of climate change and to reduce the carbon footprint of the power sector.

The vision of the State in the power sector does not see the KSEB as a competitor ranged against the development of renewable energy, as is the dominant paradigm elsewhere. The KSEB's participation indeed holds the key to the rapid deployment of solar energy, especially grid-connected solar, and other innovative solar and wind projects across the State. The "Soura" programme referred to above, has been conceptualised in this framework, with the KSEB handling a major part of the deployment. The technological capacities of the KSEB need to be harnessed to the development of renewable energy rather than being set aside or left unutilised.

The power sector in the State is fully alive to the technological advances that have taken place in the recent two decades in the country, and the State's strategy in the sector is drawing on the benefits of this advance. It is also leveraging a number of new innovative ideas and initiatives to maintain its growth in the new era of sustainability. Especially in the era of renewables, newer forms beyond solar and wind need to be considered and evaluated for development and deployment in the State. The participation of the State's S&T as well the technological higher education institutions in such efforts would be mutually beneficial to both these institutions as well as the power sector itself.

In what follows we provide a more technically detailed account of the power sector, drawn mainly from the latest Economic Review 2021 of the Kerala State Planning Board. The author is indebted to the Chief of Industry and Infrastructure Division of the KSPB for their effort to put this account together. The interested reader is invited to read the full account in the Economic Review 2021 for several details that are not entered into in this version.

The Power Sector in Kerala

Power demand:

Peak demand of the State during 2019-20 was 4316 8MW on 27.03.2019 between 22.00 hours and 22.30 hours. Morning peak demand during 2019-20 was 3465 MW, on 23.05.2019 between 08.00 hours and 08.30 hours. Minimum demand was 1302 MW on 09.08.2019 between 4.30 and 5.00 hours. Average demand for FY 2020 was 3,567 MW.

Power Generation, Purchase and Sale

Kerala State's Power scenario for 2019-20 is given in **Table 11.2.3.**

Table 11.2.3. Kerala State's Power scenario for 2019-20

Particulars	Energy in MU
Gross generation KSEBL	5781.23
Power purchase from CGS at Kerala periphery	10082.00

Power purchase through long term/medium term/short term contracts /swap at Kerala periphery	9993.52
Total Power purchase from IPPs/CPPs inside the State	308.23
Total power purchase at Kerala periphery	20383.76
Energy injected by Private IPP's at generator end for sale outside the State through open access	37.50
Energy availed through open access at Kerala Periphery	405.86
Auxiliary consumption to be deducted.	58.42
EXPORT-Energy sales by KSEBL , SWAP Return by KSEBL and Energy injected by Private IPP's at KSEB periphery for sale outside the State through open access	323.84
Total energy input to Kerala periphery for meeting the consumption of the State including energy wheeled through open access	26226.08
Total energy at consumer end including energy wheeled through open access	23058.91

Source: KSEBL

Sale of Power inside the State

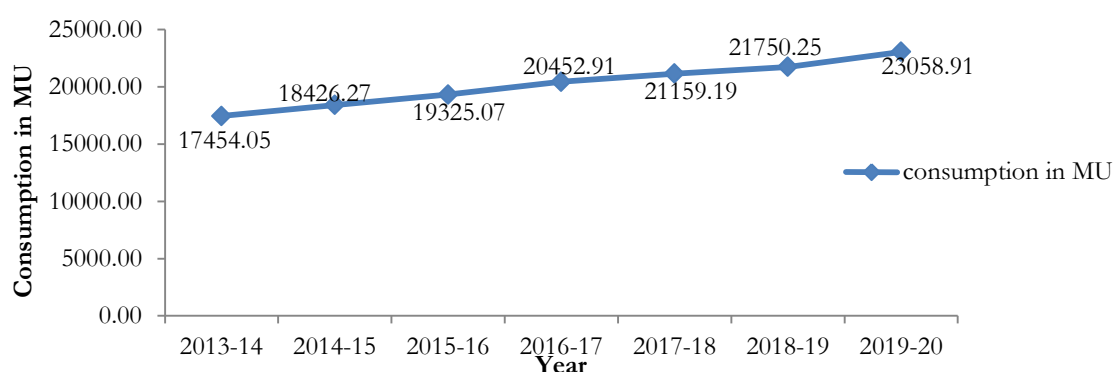
KSEBL in 2019-20 has sold 22,948.82 MU power to 1,28,26,185 consumers in the **state** including 11 bulk licences. A total revenue of Rs 13,91,754 lakh was generated. The total revenue from sale of power, including sales to other utilities outside the state is Rs.13,918.79 crore.

Power Consumption

Consumption of all LT categories of consumers increased except for the decrease in the public lighting category, the LT Industrial category and EHT consumers. The decrease in public lighting can be attributed to increase in LED lamps. The reason for the decrease in LT industrial category and EHT category has been assessed to be a consequence of the impact of Flood 2019 and Covid-19 in last quarter of the year.

In Kerala, electrical energy consumption has increased to 23,058.91 MU (include open access consumption) in 2019-20 from 21,750.25 MU in 2018-19, an increase of 5.67 per cent. Electrical Energy consumption in Kerala in 2013-14 to 2019-20 is depicted in **Figure 11.2.1**.

Figure11.2.1. **Electrical energy consumption in Kerala**

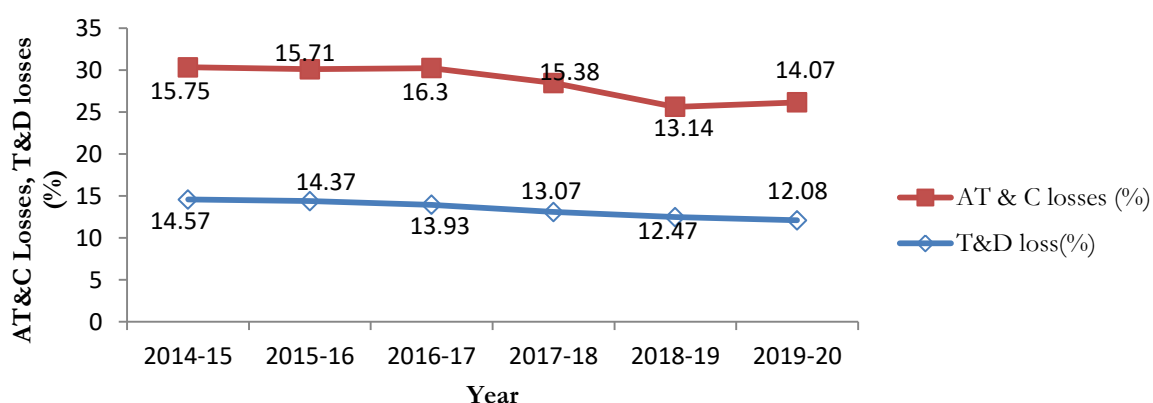


Source: KSEBL

Aggregate Technical and Commercial (AT & C) Losses

In 2019-20, AT&C loss has increased to 14.07 per cent from 13.14 per cent and transmission and distribution (T&D) loss came down to 12.08 per cent from 12.47 per cent. KSEB has made significant achievement in the field of reducing T&D loss. But AT&C loss increased due to the impact of the Covid-19 pandemic and lockdown restrictions. For Distribution SBU, the AT&C loss is 10.77 per cent and distribution loss is 8.70 per cent in 2019-20. The impact of AT&C loss reduction during the last five years is shown in **Appendix 11.2.2**. The AT & C loss and T & D loss from 2014-15 to 2019-20 is illustrated in **Figure 11.2.2**.

Figure 11.2.2 Aggregate Technical and Commercial (AT&C) losses, and transmission and distribution losses, in per cent



Source: KSEBL

Performance of Power Sector Agencies

Power development activities in the State are carried out mainly through four agencies, namely, Kerala State Electricity Board Limited (KSEBL), Agency for Non-conventional Energy and Rural Technology (ANERT), Electrical Inspectorate, and Energy Management Centre (EMC). The outlay and expenditure of these departments in Annual Plan 2019-20 and Annual Plan 2020-21 are shown in **Table 11.2.4**.

Table 11.2.4 Outlay and expenditure in the Annual Plan 2019-20 and Annual Plan 2020-21, in Rs lakh

Sl No	Name of the Department/Agency	Annual Plan 2019-20			Annual Plan 2020-21		
		Outlay	Expenditure	per cent	Outlay	Expenditure up to September 2020	per cent
1	KSEBL	1,71,237.00	1,45,238.96	84.82	1,70,821.00	46,636.11	27.30
2	ANERT	5,200.00	1,061.56	20.41	4,180.00	1,133.56	27.11
3	EMC	883.00	401.27	45.44	763.00	0.00	0
4	Electrical Inspectorate	825.00	84.94	10.29	693.00	21.65	3.12
	Total	1,78,145.00	1,46,786.73	82.40	1,76,457.00	47,791.32	27.08

Source: Plan space

In the Annual Plan 2020-21, an amount of Rs.1,76,457.00 lakh is provided for Energy sector. Out of this, Rs.1,70,821.00 lakh is for Kerala State Electricity Board Ltd. (KSEBL), Rs.4,180.00 lakh for Agency for Non-conventional Energy and Rural Technology (ANERT), Rs.693.00 lakh for Meter Testing and Standards Laboratory (MTSL) and Rs.763.00 lakh for Energy Management Centre (EMC). As per expenditure reported in the Plan space, Rs.47,791.32 lakh i.e., only 27.08 per cent of the total outlay is expended till September 2020. The expenditure reported by KSEBL is Rs.46,636.11lakh (27.30 per cent), ANERT is Rs.1,133.56 lakh (27.11 per cent), and Electrical Inspectorate is Rs.21.65 lakh (3.12 per cent). But, EMC has not reported expenditure up to September 2020.

Kerala State Electricity Board Limited (KSEBL)

Kerala State Electricity Board Limited is a (power utility) company incorporated under Companies Act 1956 (Central Act 1 of 1956). It is fully owned by Government of Kerala, under provisions of section 131 of the Electricity Act 2003 by re-vesting (under sub section (2) of section 131 and 133 of the Act) the functions, properties, interest, rights, liabilities, proceedings and personnel vested in State Government from erstwhile Kerala State Electricity Board. Revesting was done on October 31, 2013. KSEBL is a single holding company with Distribution, Transmission and Generation strategic Business units with separate accounting. The company was incorporated on January 14, 2011 and it started operation as independent company with effect from November 1, 2013. KSEBL has been responsible for the generation, transmission and distribution of electricity in the State, with particular mandate to provide electricity at affordable cost for domestic as well as agricultural purposes.

Achievements of KSEBL in 2019-20

- The power disruptions that occurred during Floods 2019 was restored and normalized within a short span of days through Mission Reconnect 2019.
- Provided uninterrupted power and maintained all essential services during Covid-19 lockdown and subsequent unlocks through its dedicated staff, maintaining strict Covid-19 protocol.
- New service connections totalling 2,91,517 were effected and 1301 nos. of new distribution transformers installed. Further, 1080.5 km of 11 kV line and 3689.141 km of LT lines constructed.
- Construction of one 220kV substation nine 110 kV, two 66 kV, six 33 kV substations and 366.4 km of lines in the voltage levels including 33 kV and above , capacity addition of 200 MVA step up transformers and 2638 MVA step down transformers are the achievements in the transmission sector.
- Transmission and Distribution losses brought down to 12.08 per cent in 2019-20 from 12.47 per cent in 2018-19. AT&C loss for Distribution Strategic Business Unit has been remained at 10.77 per cent despite impact of Covid in last quarter of 2019-20 and distribution loss is reduced to 8.70 per cent in 2019-20 from 9.09 per cent in 2018-19.
- The 400kV Tirunelveli-Kochi-Madakkathara-Udumalpet Power highway become a reality as the RoW was cleared by the resolution and action by State Government and KSEBL
- Six e-Vehicle charging stations were set up with state funds in short span of time.
- A capacity addition of 0.62 MW in Generation was achieved in 2019-20

Oorjja Kerala Mission

Government of Kerala has launched 'Oorjja Kerala Mission' on June 14, 2018, aimed at the integrated development of electricity sector in the state. It aims at implementing five important projects detailed below in the next three years. The status of these projects are analysed below

Soura

KSEB intends to achieve a cumulative capacity of 1000 MW to its renewable content through Solar Projects by 2021. The status of the projects are given in **Table 11.2.5.**

Table 11.2.5. Status of Solar Projects.

Sl. No.	Project	MWp	Target date	Status
1	Roof top solar- Phase -1 EPC	46.5	2020-21	Under implementation through three vendors.

2	Roof top solar- Phase -1 RESCO	60	2020-21	For 60MWp in RESCO demand aggregation from roof tops of Government buildings envisaged.
3	Roof top solar-Phase-2 Subsidy (sanctioned)	50	2020-21	Under tender process (12.5MW to be implemented by ANERT) and is expected to be completion by April 2021
4	Roof top solar-Phase-2 Subsidy (anticipated)	100	2020-21	Also under tendering process and .Expected completion date is December 2021
5	Solar park Ambalathara	50		Commissioned
6	Solar park Paivallika	50	2020-21	Ongoing ,developed by THDCIL
7	Solar Park-Cheemeni	100	2021-22	Land handed over to RPCKL by Government
8	NTPC Floating Solar	225	2021-22	Detailed Project Report received for 100MWp in Anchuruli and 25MWp in Cheruthoni. Another 100 MWp planned.
9	SECI Floating Solar	150	2021-22	Kulamavu -50MWp and Banasurasagar 100MWp-bathymetric survey to be conducted
10	Reverse bid by KSEBL from IPPs	200	2020-21	Bid on solar from ground mounted plants floated after approval from KSERC on all India basis
Total Soura-		1031.5		

Source: KSEBL

Filament-free Kerala

Through this project, all the existing CFL and filament bulbs in domestic and street lighting sector in the State will be replaced with energy efficient and long-lasting LED lamps targeting reduction in peak demand, global warming and Hg pollution. More than 13 lakh consumers have already registered for LED lamps in the 1st phase in which domestic sector was targeted. KSEBL has accorded sanction to award procurement of one crore LED bulbs to two firms in 70:30 ratio. It is expected that LED distribution can be completed by February 2021.

Dyuthi 2021

The projects included in the Oorjja Kerala Mission, are in progress with a mission to up lift the distribution grid of KSEBL to international level. The total plan outlay is Rs.4,036.30 crore. Devastating floods during 2018 and 2019 has also affected the progress. Also Covid- 19

pandemic has retarded the progress of projects. Now the target for 2019-20 and 2020-21 has been revised to March 2021. The financial progress is 21.85 per cent as on 30.09.2020.

Transgrid 2.0 – 2nd Generation Transmission network

This project aims at strengthening of transmission network to meet the future energy requirement of the State and is scheduled to be implemented in two phases. The 1st phase of the project is scheduled for execution during 2017-2022 and 2nd phase for 2019-2024. The works included in the 1st phase of the project are grouped into 13 packages and comprises construction of 12 substations and 2084 Circuit kilometre of EHT lines. Out of these 12 substations, 4 are Air Insulated Substations (AIS) and the remaining 8 are Gas Insulated Substations (GIS). 12 substations (AIS - 3 Nos. and GIS - 9 Nos.) are included in Phase II of the project which is grouped into 12 packages. Rs.1052.89 crore works have been completed as on 30.09.2020. This includes Rs.523.54 crore funded by KIIFB, Rs.461.87 crore funded in PSDF and Rs.67.47 crore with KSEBL's fund. Works amounting to Rs.760 crore can be completed by end of this year. This year only Rs.301.56 crore works are completed as on 30.09.2020. The physical progress of the work as on date is given in **Table 11.2.6**.

Table 11.2.6-Progress of Transgrid 2.0 - Phase I & II in 2019-20

Sl No	Work	Quantum of work	Progress
A	Transgrid 2.0 - Phase I		
a	KIIFB Funded works		
1	Erection of substations (220 kV -11, 400 kV-1)	12 nos	220 kV s/s Manjeri commissioned on 23.06.2020. Other 11 substations works are in progress
2	Construction of transmission lines	321 route-km	220 kV Karukkadam - Kothamangalam charged on 11-12-2019. Other works are in progress
b	PSDF Work		
1	Construction of transmission lines	211.46 route-km	Two packages are funded in PSDF. Kakkayam-Nallalam work commissioned. The 220 kV portion of MDKA-MLPA already charged on 10-7-2019. All other works are in progress.
B	Transgrid 2.0 - Phase II		
a	KIIFB Funded works		
1	Erection of substations (220 kV -8, 400 kV-1)	9 nos	20 kV s/s Kakkad and Pathanamthitta tendered. For Sasthamcotta, Thuravur and Irinjalakuda KIIFB sanction is awaited. In case of Panjal, Palakkad and Edamon, DPR is being prepared

2	Construction of transmission lines	431.4 route-km	Kottiyam-Kollan GIS work completed. Other two works awarded. For balance 4 works KIIFB sanction is awaited. For 6 works DPR is under preparation.
b Green Corridor Package			
1	Erection of substations (220 kV -3, 400 kV-1)	4 nos	Approval of MNRE awaited
2	Construction of transmission lines	102 route-km	

Source: KSEBL

eSafe

The eSafe project jointly mooted by Electrical Inspectorate and KSEB aims at zero electrical accidents in the State. In this budget year, Electrical Inspectorate has been allocated funds to the tune of Rs.4.08 crore to implement e-safe projects. Conduct of safety awareness programmes, rewiring tribal households at Agali, Sholayur and Pudur Panchayat Pilot implementation of safety system preventing accidents from snapping of Overhead lines and electric fence energiser test set up are envisaged this year. Also Local Self Government Department has accorded sanction to local bodies on 24-1-2020 to prepare project including family of NPG consumers to rewire their premise with at least four points and ELCB ensuring safety standards in their coming annual plan @ Rs.12,287/- per family. With the completion of the project, it is expected that all domestic households will be connected with earth leakage protection as per standards.

Generation

In 2019-20 the internal generation of KSEBL is 5781.23 MU which is 24.18 per cent lower than last year. Net generation of the state is 6050.65 MU. The internal generation of KSEBL is given in **Table 11.2.7**

Table 11.2.7 **KSEBL internal generation**

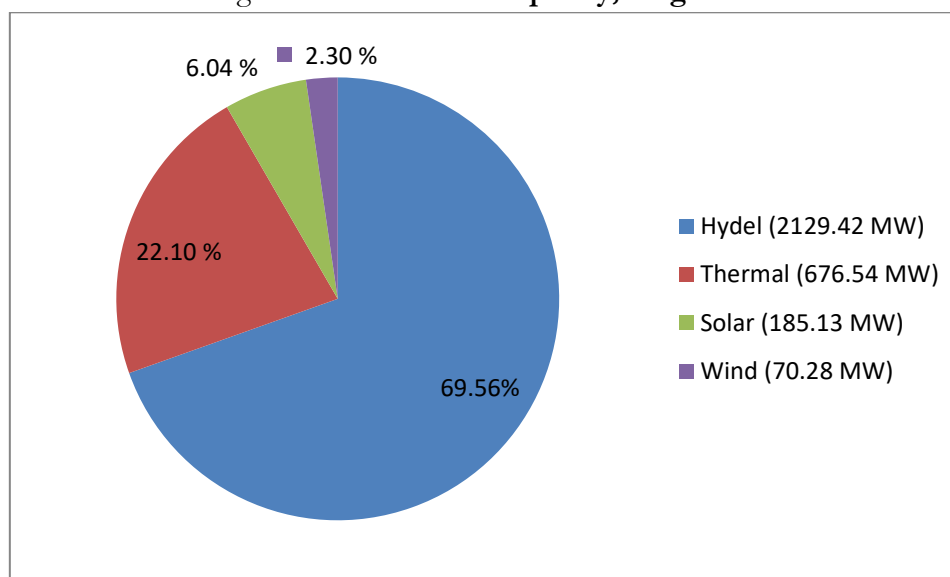
Sl. No.	Particulars	Capacity as on 31.3.2019 (MW)	Capacity added in 2019-20(MW)	Capacity as on 31.3.2020 (MW) (2)+(3)	Total Internal Generation in 2019-20 (MU)
0	1	2	3	4	5
1	Hydel	2,058.76		2,058.76	5,741.83
2	Thermal	159.96		159.96	12.03
3	Wind	2.025		2.025	1.42
4	Solar	16.85	0.62	17.47	25.95
	Total	2,237.60	0.62	2,238.22	5,781.23

Source: KSEBL

Capacity Addition in 2019-20

The total installed capacity of power in the State as on March 2020 was 3,061.37 MW. Of this, hydel power contributed the major share amounting to 2,129.42 MW (69.56 per cent); while 676.54 MW was contributed by thermal projects (22.10 per cent), 70.28 MW from wind (2.30 per cent), and 185.13 MW (6.04 per cent) from solar. **Figure 11.2.3** highlights the total installed capacity of Kerala from hydel, thermal and renewable sources.

Figure 11.2.3 Installed capacity, mega watt



Source: KSEBL

Of the total installed capacity of 3,061.37 MW in 2019-20, the contribution of State sector is 2,238.22 MW (73.11 per cent), central sector 359.58 MW (11.75 per cent) and private sector 463.57 MW (15.14 per cent).

Installed Generation Capacity

Kerala State Electricity Board Limited owns 38 hydel stations of capacity 2058.76 MW, one wind farm of 2.025 MW, two thermal plants of 159.96 MW and solar plants of 17.47 MW at various places. During 2019-20 the major addition was 60.39 MW by private plants. KSEBL added only 0.62 MW solar plants. RGCCPP Kayamkulam is the only CGS in the state. IREDA Solar Park of 50 MW at Kasaragod and 2 MW ANERT, Kuzhalmandam solar plants are the state invested projects.

Ongoing Generation Projects in the State

The details of the ongoing hydroelectric projects in the State with expected date of commissioning are given in **Table 11.2.6**. KSEBL is executing 10 Hydel projects in the state with installed capacity of 193.5 MW, to be completed by 2021-22. Details of other hydroelectric projects, which are in the pipeline, are listed in **Appendix 11.2.8**.

Table 11.2.8 Ongoing Hydro Power Projects in the State

Sl. No.	Name of Scheme	Installed Capacity (MW)	District	Date of Project Sanctioned	Expected date of commissioning
1	Thottiar HEP	40	Idukki	16.01.2009	December, 2021
2	Sengulam Augmentation Scheme	85 MU	Idukki	06.07.2009	March, 2022
3	Chathankottunada II SHEP	6	Kozhikode	09.11.2017	March, 2021
4	Poringalkuthu SHEP	24	Thrissur	01.04.2014	May, 2021
5	Bhoothathankettu SHEP	24	Ernakulam	15.02.2014	August, 2021
6	Upper Kallar	2	Idukki	12.08.2016	March, 2021
7	Pallivasal Extension	60	Idukki	02.03.2007	December, 2021
8	Pazhassi Sagar	7.5	Kannur	27.10.2017	December, 2021
9	Chinnar	24	Idukki	27.04.2018	April, 2022
10	Peruvannamoozhy	6	Kozhikode	25.05.2018	May, 2021

Source: KSEBL

Enhancing Renewable Energy component in the Energy Mix of the State

KSEBL is considering all option to harness renewable power. Besides development of solar power through Soura projects, installations of other renewable plants are expedited. The target is to meet 40 per cent of energy requirements from Renewables by 2022. The existing, ongoing and pipeline renewable projects for 3309 MW are given in **Table 11.2.9**.

Table 11.2.9 Ongoing and pipeline renewable projects in the State

RENEWABLE ENERGY -Installed ,Ongoing and Proposed				
	Project	Capacity in MWp	Year of Completion	Present Status
A	SOLAR			
I	Existing	204.22		

ii	Ongoing and Proposed			
1	KSEBL projects	23.27	2020-21	Ongoing 13.355 MWp and Proposed 9.912MWp
2	Solar park -THDCL Paivallika, Kasaragode & Cheemeni.	150	2019-20	Paivalika 50MWp ongoing, Cheemeni 100MWp-land handed over to RPKCL
3	Saura Roof top solar-Phase -1	110	2020-21	46.5 MW in EPC mode under implementation. For 60MWp In RESCO demand aggregation from roof tops of Government buildings envisaged.
4	Saura Roof top solar-Phase -2 MNRE subsidy scheme	150	2020-21	50 MWp allocated by MNRE is under tender process (12.5MW to be implemented by ANERT) and is expected to be completed by April 2021. Balance 100MWp allocation expected from MNRE is also under tendering process and .Expected completion date is December 2021
5	NHPC Floating Solar , West Kallada	50	2019-20	Tendering in process
6	NTPC Floating Solar-Kayamkulam	92	2020-21	Draft PPA Signed, work awarded by NTPC.
7	NTPC Floating Solar	225	2021-22	Detailed Project Report received for 100MWp in Anchuruli and 25MWp in Cheruthoni. Another 100MWp in Cheruthoni is under consideration
8	Reverse bid by KSEBL from IPPs	200	2020-21	Bid on solar from ground mounted plants floated after approval from KSERC on all India basis
9	PM-KUSUM	50	2020-21	Demand aggregated for 10MWp sanctioned .Requested for additional 40 MWp to MNRE
10	SECI Floating Solar	150	2021-22	Kulamavu -50MWp and Banasurasagar 100MWp-bathymetric survey to be conducted

11	Solar Power through SECI	200		Negotiation in process
	Total Solar-Existing, Ongoing and proposed	1604.49		
B	Wind			
I	Existing	80.28		
II	Proposed and ongoing			
1	NHPC Palakkad	8	2019-20	Ongoing
2	Ramakkalmedu (Pvt.)	2	2019-20	Ongoing
3	SECI TRANCHE VI scheme	200	2020-21	PSA executed
4	SECI TRANCHE VII scheme	100	2020-21	PSA executed
5	KSEBL-Kanjikkode	2.5	2020-21	Ongoing
6	KSEBL-Intercropping	2.65	2020-21	Ongoing
	Total ongoing and proposed	395.43		
c	Hydel (Renewable)			
i	Existing	215.56		Ref ER Table 14
ii	Proposed-Ongoing	193.5		Ref ER App Table 5.3
iii	On pipeline	894		Ref ER Table -3 (Includes 780MW Idukki extension scheme)
	Total Hydel under RE-existing, ongoing and proposed	1303.06		
D	Waste to Energy			
1	Wayanad	0.2	2019-22	Planned

2	Njalianparambu	6	2019-22	Tender invited for work
	Waste to Energy- Total ongoing and proposed	6.2		
	Total Capacity expected at the end of 2021-22	3309.18	MWp	

Source: KSEBL

Distribution

The distribution network as on March 31, 2020 has 64,212 Ckt-km of 11 kV lines, 2,93,280 Ckt-Km of LT lines and 81,470 distribution transformers with step down capacity of 9,915 MVA. The target and achievement of the distribution infrastructure during 2019-20 are given in **Appendix 11.2.7**. The infrastructure development of distribution system is included in Dyuthi 2021 project, under Oorjja Kerala Mission. During Covid-19 lockdown, KSEBL implemented several relief measures to consumers to support them during hard times. Also Customer Care Centre was strengthened and new services introduced to achieve customer loyalty and facilitate care of service.

1. **Service at Door steps**-Pilot implementation started in 39 sections under Electric Circle, Palakkad. As the name indicates the programme is to provide all services rendered by KSEBL to public as well as consumers at their door steps on call. The pilot implementation has attracted attention of all parties and is lauded as an earnest step in customer satisfaction by public as well as the media.
2. **Self-Meter Reading App - KSEBL** is developing a self-meter reading app and is planning to implement it by first November 2020. The app can be used by layman with ease. The app will serve as a solution to door lock problems and meter reading errors. The novel step will be useful for all categories of consumers as well as KSEBL field staff.
3. **e-samayam**- e-samayam, a virtual queue to visit section offices of KSEBL is being implemented as pilot in Kesavadasapuram and Vellayambalam section in Trivandrum.

Transmission –Normal

To achieve the goal of 24x7 uninterrupted quality power to the consumers and also for availability of power on demand, sufficient capacity of transmission network is to be developed. Also, works are necessary to satisfy the N-1 planning criteria put forth by the Central Electricity Authority. It is targeted to complete another 45 substation of different voltage level and 1300 circuit kilometre of transmission lines by March 2022.

Other flagship projects of KSEBL

In addition to five projects included in Oorjja Kerala Mission cited above, the following four projects also form the flagship projects of KSEBL.

E-Mobility

The State of Kerala is one among the first in India, which declared its e-mobility Policy. KSEB has been designated as the State Nodal Agency to ensure deployment of e-Vehicle charging stations across the State. With State funding of Rs.8.2 crore, KSEBL planned to set up 32 charging stations covering all districts of the state for ensuring state wide charging facility for e-Vehicles. Of this 6 stations are completed and work for balance stations are in progress. In central funding through Department of Heavy Industries, Faster Adoption and Manufacturing of Electric Vehicles in India (FAME-India) PHASE-II Scheme, 30 charging stations are being installed in seven cities with over one million populations. As on 15-10-2020 the Central Government has sanctioned another 181 stations and the installation of these 181 stations has to be completed by March 2022.

Kerala Fibre Optic Network (K-FON)

The scope of the project is to build a Wide Area Network across the State in order to provide cost effective and high speed internet connection to 30,000 Government offices and educational institutions and free internet access to 20 lakh BPL families. Implementation and maintenance of the network will be carried out by a Special Purpose Vehicle (SPV) with equity partnership of KSEBL, KSITIL and the State Government in the ratio 49:49:2. Among other benefits to KSEBL, the project ensures High Speed Internet Connectivity to all its offices. KSEB will get pole rent plus 4 fibres free of cost along the distribution line (47,289km). It will meet additional data communication requirements for Control and Protection, Smart Grids and Smart Meters and Internet of Things. The assets created will vest with KSEBL.

The works are awarded in two packages. Package A with PAC Rs.1028.2 crore funded by KIIFB consist of K-FON works and Package – B, Reliable communication and Data acquisition network (RC & DA network) with PAC Rs.99.2 crore in PSDF fund. The OPEX for Package A and B for seven years is Rs.363.42 crore

The progress as on 30-9-2020 is as follows:

- NOC Non IT- 85 per cent completed.
- DR IT -50 per cent completed.
- Point of presence (PoP) - Civil Foundation works for 119/ 375 PoPs and Prefab erection for 85/375 PoPs have been completed.
- Optical Ground Wire (OPGW) – 42.511/ 2600.066 KM has been completed.
- All Dielectric Self-Supporting cable – 5535/ 35000 km has been completed.

Enterprise Resource Planning (ERP)

ERP will allow KSEBL to use a system of integrated applications to manage the business and automate many back office functions related to accounting, material management and human resources. The project was conceived as a Centrally Sponsored Scheme under IPDS. ERP Project Plan was submitted to Power Finance Corporation. First instalment of Rs.42.64 crore sanctioned (60 per cent grant) and Rs.6 crore has been received. ERP implementation to be completed by August 2020. Extension up to March 2021 has been issued by PFC. ERP software is being developed in house and progress is as follows:

- Project Plan finalized and development team formed as per time line.
- UAT to be started from November 2020.

- Coding started from 30-09-2019 and it is in the final stage except some gaps. Delayed due Covid-19 restrictions.
- Looking for module wise implementation and planning to start procurement module from December 2020.

Communicating Fault Pass Detectors (CFPD)

The employees of KSEB, after in-house research, developed cost effective Communicating Fault Pass Detectors which are very user friendly. KSEBL intends to deploy 16,267 plus CFPDs in its HT network within 2022. The progress as on 30-9-2020 date is as follows:

- 3255 units were assembled and issued so far, of which 2564 units have been installed by 06.10.2020. Out of the total installed 801 units are found faulty.
- The training of System Supervisors for field level maintenance assistance for CFPDs completed.

Central Government schemes

In the current state of fiscal federalism in the country, or more precisely given its current lacunae, the role of Central government funding is very significant through the implementation of Central government schemes. The details of implementation of important central Government power sector schemes in Kerala are detailed below. The state government however, through the KSEB, exercises its discretion in the implementation of parts of these schemes as warranted.

Ujwal DISCOM Assurance Yojana (UDAY)

This is the financial turnaround and revival package for electricity distribution companies (DISCOMs) initiated by the Government of India. Kerala Government and KSEBL signed MoU with GoI. The objective of signing MOU is improvement in internal efficiency of KSEBL. No financial assistance is included in MOU. KSEBL has achieved important operational targets except smart meter installation, ERP and Rural feeder audit. ERP being developed in house is in coding stage and feeder monitoring has been completed for rural feeders. KSEBL has taken a policy decision not to implement smart metering as on date.

Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY)

Govt. of India scheme, Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY) for the rural areas, was implemented in Kerala for rural electrification and strengthening of sub-transmission and distribution infrastructure, including metering at distribution transformers, feeders and consumers end. The details of financial and physical progress of implementation of DDUGJY are shown in **Appendix 11.2.10**. The closure report has already been submitted to REC.

Pradhan Mantri Sahaj Bijli Har Ghar Yojana–“Saubhagya”

Under Saubhagya scheme free electricity connections to all households (both APL and poor families) in rural areas and BPL families in urban areas including single point wiring were envisaged. Saubhagya as such, was not sanctioned to Kerala. Rs.95.75 crore (less state tax, net amount of Rs.88.45 crore) was sanctioned to Kerala to reconnect 3,19,171 households de-electrified during 2018 floods. Of which, Rs.54.59 crore has been received. The closure report of Saubhagya has already been submitted to REC on 27-2-2020.

Integrated Power Development Scheme-IPDS

IPDS stage-1 was implemented in 25 distribution circles in the State to strengthen sub-transmission and distribution networks, metering of distribution transformers, feeders and consumers in urban area. Closures of IPDS (System Strengthening) for 25 Circles are in progress for submission to PFC Ltd.

The progress of IT part is as follows:

- **Phase-II IT Implementation under IPDS-** The DPR for Rs.22.86 crore, covering 21 Towns was sanctioned on 20.02.2017. Implementation related activities like ring fencing has been completed in all 21 towns. 367 modems in border meters and feeder meters of all 21 towns are installed. Modems are communicating with central server. The integration of software applications with the existing RAPDRP applications are progressing.
- **Real Time Data Acquisition System (RT-DAS) for Non-SCADA Towns under IPDS**
The Notice Inviting Tender for implementing RT-DAS was published on 09.07.2019. Since only one bidder has qualified the Technical evaluation, retendering was done. Now after Letter of Acceptance was issued to M/s. SCOPE TNM Pvt. Ltd. on 11.06.2020.
- **ERP Implementation under IPDS-** See ERP under flagship projects
- **Smart Meter Implementation for UDAY participating states under IPDS-** KSEBL has decided not to proceed with Smart Metering as on date.
- **RAPDRP Part A-SCADA/DMS Project -** Part-A installation of SCADA completed in all three cities, Trivandrum, Kochi and Kozhikode. Third party inspection has been completed. Part- B works completed on 31-3-2018. Project closure was done on June 2018.
- **Big Data Analytics-** *It is envisaged to develop a system for Big Data Analytics with an objective to transform large amount of raw data from the Core Applications of KSEB to a knowledge base for analytical purpose.*
- **Cyber Security Projects**
The following projects will be implemented in KSEBL with the handholding support of the Cyber security Consultant
 1. *Implementation of various advanced cyber security measures for improving the overall IT security landscape of the Organisation*
 2. *Avoiding ISO Certification for the Data Centre/ DR Centre.*
- **KFON Project-** Elaborated under flagship projects in states.

Pradhan Mantri Kisan Urja Suraksha evam Uttahan Mahabhiyan (PM KUSUM)

PM -KUSUM envisages utilisation of barren agriculture land for installing solar plants, providing a permanent income to farmers from power generation and solarisation of agriculture pumps which will reduce utilisation of power from grid and in turn reduce financial support from Government in the form of subsidies. MNRE has allotted 10MW solar plants to the state in component-A of PM-KUSUM scheme. KSEBL is implementing the scheme and has put forward two models for land owners .The first one is the Lease Model where panels are installed on lease (EPC/RESCO method) and second one is the Investment model (PPA method) where investment is done by land owners itself. 169 participants have registered in PM-KUSUM. Detailed survey completed and locations suitable for 10 MW plants have been identified in both models. Discussion with applicants in investment mode will be initiated at first

and it is expected that the project can be completed at the earliest. In component –C, Solarisation of 10 Lakh Grid-connected Agriculture Pumps of individual pump capacity up to 7.5 HP included. Government of India will provide financial support up to 30 per cent of the cost of solarisation and States to also provide at least 30 per cent of the cost of solarisation, balance cost to be shared by the beneficiary farmer. ANERT is entrusted to implement solarisation of grid connected pumps.

Sustainable Rooftop Implementation for Solar Transfiguration of India (SRISTI)

Government of India, Phase II Grid connected rooftop solar programme, with a target for achieving cumulative capacity of 40,000 MW from Rooftop Solar (RTS) Projects by the year 2022 will be implemented with total central financial support of Rs.11,814 crore with Power Distributing companies (Discoms) as implementing agencies. Domestic consumers with ceiling of 10KWp plants are eligible for CFA. 50MW has been allocated to the state in this subsidy scheme. The 37.5 MW capacity of the project will be executed by KSEBL and rest 12.5MW by ANERT. The State has requested for an additional 200MW for 2020-21

24 x7 Power for all

Kerala has attained 24 x7 power supply status in all areas of the State including agriculture consumers. 1,100 Urban feeders and 640 rural 11kV Feeder are connected to National Power Portal (NPP) and can be monitored.

Unnat Jyoti by Affordable LEDs for All (UJALA)

This scheme provides LED bulbs to domestic consumers with a target to replace 770 million incandescent bulbs in the country with LED bulbs by June, 2020. Kerala has already replaced 135.6 lakh lamps in households with LED bulbs. The achievement of the State is 83.76 per cent

Perform Achieve and Trade (PAT)

PAT scheme is a flagship programme of Bureau of Energy Efficiency under the National Mission for Enhanced Energy Efficiency (NMEEE).The **second cycle** of PAT, notified in March, 2016 covers DISCOMs also. The Kerala State Electricity Board Limited has complied with all requirements mandated by the PAT Rules. KSEBL has ensured prompt and timely satisfaction of all action points stipulated in the PAT scheme, as part of the PAT Cycle II. KSEBL has also complied with all the mandatory provisions of the Energy Conservation Act 2001, as an electricity distribution company.

State funded projects

The progress of State Government funded projects in 2019-20 are given in **Table 11.2.10**

Table 11.2.10 - The progress of State Government funded projects

Sl.No	Project	Requested by KSEBL (crore)	As accorded by Government (crore)	Expenditure (crore)
1	ERP implementation	5.68	5.68	5.68
2	Smart Grid Kochi	17.6		
3	Tidal and Wave energy	0.02	.02	
4	ESCOT project- HVDS	0.46	.46	

5	ESCOT Project- Standardization of DTR	0.54	.54	
6	Edamon Kochi 400KV line compensation	3		3
	Total	27.3	6.7	8.68

Source: KSEBL

Power Grid Corporation of India Limited: Interstate projects

The major interstate transmission projects relevant to Kerala are:

Pugalur-Trichur HVDC project- This project is an extension of 600MW Raigargh –Pugalur HVDC corridor to Kerala. The Raigargh –Pugalur corridor has been test charged on May 2020. This 320kV DC line of length 153.5 km has 92 km inside Kerala. Of this, 64 km up to Vadakkanchery is as overhead and rest 28 km is through UG cable. The line has 2000 MW capacity. The progress as on 30-9-2020 is as follows.

- 400kV HVDC station Thrissur – 95 per cent completed.
- Transit Station Vadakkanchery –Expected to be completed by October 2020.
- 320kV HVDC –UG cable Vadakkanchery –Thrissur stretch - completed 320kV HVDC OH Portion (Ozhalapathy to Vadakkanchery).
- Stringing on 12.34 km out of total 63.641 km pending
- 400kV LILO section (Thrissur S/S to 400kV Kochi-Thrissur line)-Completed.

The project is expected to be completed by December 2020.

Edamon-Kochi 400kV line-

The Edamon –Kochi line was test charged on 2-9-2019. With the completion of this stretch, first 400kV power high way through the state i.e. Tirunelveli- Kochi- Thrissur- Udumalpet become reality. The line has 800MW Capacity.

Dam Rehabilitation and Improvement Project (DRIP)

Dam Rehabilitation and Improvement Project (DRIP) aims to improve the safety and sustainable performance of existing dams and associated structures with the assistance of World Bank through Govt. of India. It is a flagship project of Ministry of Water resources, GR&RD, Government of India. The project has been extended to March 2021. The components of DRIP are:

Component 1- Rehabilitation; remedial measures and improvement of basic facilities of 12 Hydro Electric projects consisting of 37 dams.

Component 2- Institutional strengthening.

Component 3- Project management.

In component 1 and 2 financial progress of Rs.118.80 crore are achieved, while balance of Rs.3.2 crore are only in tender stage, while in component-3 progress already achieved is Rs.10.8 crore. The total expenditure incurred in all the components as per IUFR calculation till the quarter

ending 30.06.20 is Rs.102.7 crore. The amount of claim reimbursed till date to Government of Kerala through GoI is Rs.99 crore. The amount received by KSEBL from GoK is Rs.62.8 crore.

DRIP II

In line with ongoing DRIP projects, CPMU, Central Water Commission is perusing with second phase of DRIP through World Bank Assistance. Administrative sanction has been obtained for Rs.70 crore works from KSEBL. Works amounting to Rs.22.5 crore have been tendered. The works included are strengthening of Poringalkuthu dam, strengthening road and setting up CC lab at Idamalayar dam.

Power Theft

Cases of power theft and connected abnormalities are very low in the State due to strict enforcement of law and awareness in society. KSEBL has Anti Power Theft Squad (APTS) constituted to detect pilferage and misuse of electricity in all districts. Field staff is also given monthly targets for inspection. During 2019-20, 338 theft cases were detected, from which 2.38 MU were estimated as extracted by theft and malpractices. The cost of energy collected from assessments made during inspections in 2019-20 is Rs.7.66 crore. Compared to 2018-19, there is an increase of 42.61 per cent in number of cases detected and 114.41 per cent increase in MU estimated. The cost of energy collected from assessments increased by 284.92 per cent.

Electrical Accidents

KSEBL has targeted 2019-20 as zero accident year and efforts were made to attain the objective. Considerable progress has been achieved in reducing accidents to department staff. There were 113 fatal accidents to human beings and 39 fatal accidents to animals from KSEBL installation. Compared to 2018-19 there is a decrease of 8.13 per cent in fatal accidents to human beings and a decrease of 30.35 per cent fatal accidents to animals. There was also 185 non-fatal accidents to human beings in 2019-20, while it was 211 in 2018-19. From consumer installations, 126 fatal accidents occurred to human beings and 25 Non-fatal accidents to human beings.

Recent Disasters and Their Impact

Impact of Covid-19 on the Power Sector

Due to the lockdown imposed by the Government from March 24, 2020, there has been considerable impact on the power sector. There has been considerable reduction on electricity consumption due to lockdown and consumers were unable to pay their due to the distribution companies. This has also affected the liquidity position of the distribution companies impairing their ability to pay to the generating and transmission companies

Important policy measures announced by Central Government

Ministry of Finance, Government of India vide Office Memorandum No.F.18/4/2020- PPD dated 19.02.2020 had clarified that disruption of supply chains due to spread of novel Corona Virus in China and any other country will be considered as a natural calamity and *force majeure* clause may be invoked wherever considered appropriate following due procedure.

In order to address the liquidity crunch of the distribution licensees, Ministry of Power, Government of India vide Order No.23/22/2019-R&R dated 27-3-2020, relaxed the provision of 100 per cent payment security to be ensured by the State Load Dispatch centres for the purchase of power by distribution licensees. As per the relaxation, it has been decided that considering the unprecedented and *force majeure* situation, power may be scheduled even if payment security mechanism is established for 50 per cent of the amount for which payment security is to be otherwise established contractually till 30-6-2020.

Ministry of Power, Government of India as per letter No.23/22/2019-R&R Part-4, dated 28-3-2020 had issued Directions under Section 107 of the Electricity Act to Central Electricity Regulatory Commission in public interest to specify a reduced Late Payment Surcharge (LPS) for payments which become delayed beyond a period of 45 days from the date of presentation of bill during the period from 24-3-2020 to 30-6-2020 to generating companies and licensees treating the restrictions placed by the Central Government as *force majeure* event. The reduced LPS is applicable for a period till 30-6-2020. Further, it was stipulated that the LPS should not be more than the cost that the generating companies and transmission licensee would have to bear because of the delayed payment. In the case of generating companies and transmission licensees, whose tariff was determined under section 63, Discoms may claim the relief from its obligations regarding the rate at which LPS is to be paid as per the *force majeure* provisions in the PPA.

Government of India has also requested the State Governments to issue similar directions under Section 108 of the Electricity Act to respective State Commissions and the distribution companies pass on similar or more benefits to the consumers with regard to LPS. Further to this, Central Government vide letter No.11/16/2020-Th- II dated 15-05-2020 issued advisory to all Power Generation and Transmission CPSEs under Ministry of Power and all Subsidiaries/Joint Ventures of Power Generation and Transmission CPSEs under the Ministry of Power for deferment of capacity charges for power not scheduled, to be payable without interest after the end of lockdown period in three equal instalments and to provide rebate of about 20-25 per cent on power supply billed (fixed cost) to Discoms and inter State Transmission charges levied by PGCIL. The advisory was communicated to the Government of Kerala and Discoms for passing on to the end consumers in the electricity bill for the lockdown period on account of Covid-19 Pandemic.

Further to this, Ministry of Power vide letter dated No.11/16/2020-Th-II dated 10-06-2020 communicated the amount of rebate as Rs.50.86 crore and the capacity charges deferred is 63.38 crore. to State of Kerala.

Reliefs announced by Government of Kerala

Government of Kerala has also announced several measures for coping with difficulties encountered during the lockdown. The Chief Minister, Government

of Kerala in the press conference held on 21.04.2020, announced that the Industrial and Commercial Consumers of KSEB Ltd. have been provided with an option for the deferred payment of fixed charges for the months of March, April and May- 2020 up to 15.12.2020 at an interest rate of 12 per cent (instead of 18 per cent) on deferred fixed charges. Later, this facility has been extended to Private Hospitals also, as per the directions of State Government. The domestic consumers were also allowed to remit half of their bill amount during lockdown period and to remit balance amount in two equal instalments.

Impact on finances of KSEB

The Covid-19 pandemic has adversely impacted the financial position of KSEB Limited. It is estimated that the loss sustained by the utility during the period March to July 2020 because of the pandemic and considering the factors mentioned hereunder will be around Rs1240 crore.

A summary of financial impact of COVID-19 on KSEB is given in **Table 11.2.11.**

Table 11.2.11- Financial impact of Covid-19 on KSEB (as estimated on 31.07.2020)

1.	Loss of revenue due to reduced sale of energy	Rs 865.13 crore
2.	Arranging transportation for stranded employees	Rs0.08 crore
3.	Waiver of interest on delayed payment of electricity charges (domestic)	Rs12.28 crore
4.	Absorption of bank transaction charges for online payment	Rs4.50 crore
5.	Providing cash-back for promotion of online transaction	Rs9.00 crore
6.	Waiver of Application Fee	Rs1.00 crore
7.	Rebate on Fixed Charges (Industries/Comml Establishments. and Pvt Hospitals)	Rs76.62 crore
8.	Interest burden on deferred payment of Fixed Charges	Rs3.24 crore
9.	Additional Subsidy to Domestic Consumers	Rs200.00 crore
10.	Interest burden due to deferment of Additional Security Deposit	Rs17.00 crore
11.	Setting up Covid-19 relief facilities	Rs50.00 crore
12.	Interest burden due to deferment of Pole Rental Charges	Rs0.20 crore
13.	Total	
	Rs.1239.05 crore.	

Source: KSEBL

Floods and their Aftermath

Floods 2019

Most of the losses due to the monsoon in 2019 were in the northern districts of Palakkad, Kannur, Kozhikode, Malappuram and Wayanad. The three generators of Kakkayam, seven minor hydroelectric power stations and floating solar plant on the Barapole Canal were damaged. The operation of 43 substations, including two 220 kV substations and six 110 kV substations, was disrupted. It is estimated that 50.47 lakh consumers were affected by the 2019 floods. It is estimated that KSEBL had suffered a loss of Rs. 243.05 crore during this monsoon.

Floods 2020

The State of Kerala witnessed heavy cloud bursts followed by incessant rains bringing in large scale damages, as part of the monsoon during August 2020. A large number of structures including electrical installations were damaged due to uprooted trees and some installations were washed away due to landslide and gushing water. KSEB Ltd. was one of the affected departments with many of its installations damaged and its distribution network in disarray. Damages caused widespread interruptions, especially in the Idukki and Kannur districts.

In the distribution network damages to 56 transformers and 8506 poles were reported, along with distribution line snapping at 36,274 locations (length of conductor damaged - 7254.9 km) causing damages to the extent of 86.18 crore as per KSEBL estimation

Emergency Action Plans for Dams

As on date Emergency Action Plan (Tier-I) for 37 dams approved by CWC has been published in KSEBL web site. Stakeholder consultation meeting for 24 dams of KSEBL was conducted. O&M manuals for 36 dams approved by CWC are published in the web site of KSEBL.

De-siltation of reservoirs

In the light of unprecedented rain fall and consequent landslides and flood during August 2018 and August 2019, KSEBL accorded sanction to invite Request for Proposal (RFP) for the desiltation of reservoirs of KSEB as per the guidelines specified in the approved Standard Operating Procedure (SOP) by Government of Kerala. Desiltation work of Lower Periyar reservoir has been awarded to M/s Travancore Cements Ltd. The work could not be started for want of temporary diversion of forest land for stacking the desilted material. In the case of Maduppety, Anayirankal, Ponmudi, Sengulam and Kallarkutty reservoirs, tenders were invited for assessing the storage capacity and letter of acceptance issued to M/s. Geo Marine Solutions Private Ltd., Mangalore on 30.09.2020. For Poringalkuthu reservoir Bathymetric survey was arranged through Kerala Engineering Research Institute, Peechi. Kundala reservoir storage capacity has been assessed recently and no desiltation required. Storage assessment study of major reservoirs is planned in Drip-II.

Key Challenges and Issues

- The following are some of the key challenges and issues that the KSEB faces in the immediate future. **Legal Environment-** Further liberalisation of the electricity market as proposed in the Electricity (amendment bill) 2020, if realised would further erode the consumer base and revenue of the utility considerably, which has been affected already by various challenges. The new Sub License clause may lead to induction of private licensees in profit prone areas. In the case of draft **Electricity (Rights of Consumers)** Rules, 2020 the bulk of the proposals have already been implemented by the KSEB but some proposals like prepaid metering have financial implications. The draft standard bidding documents for privatisation of distribution licences if implemented will leverage the process of privatisation, and many clauses like costing of assets in NPV which allows transfer of asset at a very low value. These amendments question the very existence of the utility in public sector.
- **Power purchase-** KSEBL has been able to keep power purchase cost at an optimum level. Due to exorbitant cost, Kerala is not in a position to absorb power from the Kayamkulam unit of NTPC; but is paying the Fixed Charge. Intervention of the power ministry was requested to ensure that the burden is brought down to a minimum by reduction in annual fixed cost and additional allocation of alternate cheaper power to Kerala, but no intervention has happened made till date. Also increase in cost of thermal power due to FGD and DeNOx equipment installation in thermal power stations across the country and the transfer of the burden to distribution companies remains a threat.
- **Transmission-**Inadequate power corridors to import power from the Northern grid and insufficient network of intra state transmission lines have been the issues faced by the State. Right of way problems and scarcity of land for drawing new transmission lines is the main hindrance for intra state transmission network development. As per the CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020, the transmission charges of AC line under balance component will lead to transferring of liability of underutilized capacity to states like Kerala who are not responsible for these asset additions. It is expected that there will be an increase in transmission charges payable by State to 2-3 times the existing charges. Also in case of the Raigargh - Pugalur-Madakkathara HVDC line, 70 per cent of the transmission charges have to be paid as regional component. If the line is declared as national asset, the burden on State can be reduced by 30 per cent
- **Distribution-**The network has many bottle necks like poor networking, old and under rated lines, lack of alternate feeding facility, low HT/LT ratio and non-standard structures. Increasing electrical accidents is another issue faced. Upcoming e-vehicles boom, demands adequate charging infrastructure and additional power. The delay to announce and implement new central schemes for distribution sector has forced the utility to divert its own fund for capital works. The task of installation of smart meters in distribution as envisaged by GoI is also a challenge to KSEBL which possibly can reduce losses and enhance prudent revenue collection.
- **Covid- 19** –Impact of Covid- 19 on the utility has been severe. ‘Liquidity Infusion Schemes are the need of the hour. The ‘Liquidity Infusion Schemes under the ‘Atmanirbhar Bharat Abhiyan’ is only a loan package; that too with an unreasonable interest rate and conditions like government guarantee. Moreover, the scheme which proposes to transfer the amount directly to generating companies to clear their dues from DISCOMs is practically of no use to utilities like KSEB who are making prompt payment

NON-CONVENTIONAL AND RENEWABLE SOURCES OF ENERGY

Like many other States, Kerala also has a public entity, independent of the main public utility, for renewable energy. This is ANERT, the Agency for Non-conventional Energy and Rural Technology (ANERT). The Energy Management Centre (EMC) implements programs on energy efficiency, one of India's major climate mitigation goals and small hydel projects.

Agency for Non-Conventional Energy and Rural Technology (ANERT)

Agency for Non-conventional Energy and Rural Technology (ANERT) is an autonomous body under the Power Department, GoK. ANERT is the independent agency for the implementation and propagation of non-conventional sources of energy in the State. It is also the nodal agency for the Ministry of New and Renewable Energy Sources (MNRE), GoI, to carry out the Central Government programmes in Kerala.

The scheme-wise outlay and expenditure of ANERT in 2019-20 and 2020-21 (expenditure up to September 2020) is given in **Table 11.2.12**.

Table 11.2.12 -Outlay and expenditure of ANERT in 2019-20 and 2020-21, in Rs lakh

Sl N o	Schemes	Annual Plan 2019-20			Annual Plan 2020-21		
		Outlay	Expendi ture	per cent	Outlay	Expendi ture up to September 2019	per cent
1	Programmes on Renewable Energy	3,500	478.80	13.68	2030.00	863.28	42.53
2	Renewable Energy Public Engagement, Outreach, Studies and Development	1,700	582.77	34.28	400.00	270.28	67.57
3	ANERT – a Knowledge Hub for Renewable Energy				1750.00	0.00	0.00
	Total -ANERT	5,200	1061.57	20.41	4180.00	1133.56	27.11

Source: Planspace

Achievements of ANERT in 2019-20

Some of the key achievements of ANERT most recently include:

- 100 kW solar hybrid power plants have been installed. These are grid-connected systems with minimum battery storage to provide backup for critical loads. This is in light of the new regulation of the KSERC permitting grid-connected systems with battery storage. The inauguration is expected to be done shortly.
- In government buildings the total capacity Commissioned is 619 kW with ANERT Plan funds, and 1350 kW with the institutions' funds
- Installation of 4.3 MW of solar rooftop system under MNRE subsidy programme (April to September 2019)
- Installation of solar cold storage, with capacity of 5 tonnes vegetable storage for 30 hours, with a rating of 6 kW solar at the Subicsha Coconut Producer Company Ltd, Kozhikode
- Solar Water ATM Two 3000 lpd water purification system with 3 kW solar systems installed at Alappuzha (commissioned) and Kannur
- A community solar steam cooking system was installed at the Neryamangalam Pre-Matric Hostel, for 100 inmates, using 30 sq. metre solar concentrating collectors
- Electric vehicles are being provided on hire to government departments and institutions in a tie-up with EESL
-
- Training was provided for Urja Mithra technicians, accredited solar installers and inspectors.

Other projects in various stages of implementation:

- Rooftop solar for Police Department buildings in Ernakulam district – orders issued for 300 kW
- Solar charging station at ANERT (with fast charge facility) nearing completion
- Under the programme of setting up power plants for private entities – 5 MW solar power plant in a quarry at Malappuram – MOU signing stage
- Moonglimada – a 6 MW solar power plant in the land of KWA at Palakkad is in the tendering stage
- Training programme for college students in association with respective colleges – online basic programme to be launched in a few days. Many requests being received for advanced courses in renewable energy
- Testing laboratory set up for solar systems in cooperation with STIC (CUSAT)

As part of ANERT, a preferential tariff/generation based incentives/viability gap funding to promote RE projects meeting RPO targets, a renewable energy fund in the form of green energy cess against every unit of nonrenewable energy consumed, Policies for limiting wheeling/transmission charges on Renewable Energy & enhanced limits on solar generators to grid, Standard operating procedures for RE projects and making RE marketing in major domestic buildings/commercial industries, Hallmarking percentage of the infra fund in various sectors for RE projects, Re- orienting ANERT as a knowledge hub for Renewable Energy are to be considered.

Energy Management Centre (EMC)

Energy Management Centre (EMC) is the State designated agency of Bureau of Energy Efficiency, MoP, GoI for promoting energy conservation, energy efficiency and enforcing Energy Conservation Act, 2001 in the State. EMC also promotes small/mini/micro hydel schemes. SHP Cell constituted by GoK under Power Department is also attached in EMC to give impetus for development of SHPs through private participation.

The scheme-wise outlay and expenditure of EMC in 2019-20 and 2020-20 (expenditure up to September 2020) is given in **Table 11.2.13**.

Table 11.2.13 - Outlay and expenditure of EMC in 2019-20 and 2020-21, in Rs lakh

Sl No	Schemes	Annual Plan 2019-20			Annual Plan 2020-21		
		Outlay	Expenditure	per cent	Outlay	Expenditure up to September 2019	per cent
1	State Energy Conservation Awards	25.00	10.00	40.00	25.00	0.00	0.00
2	Energy Conservation Activities	312.00	175.90	56.38	228.00	0.00	0.00
3	Infrastructure Development and Institutional Strengthening	361.00	149.96	41.54	295.00	0.00	0.00
4	Kerala State Energy Conservation Fund	185.00	153.50	82.97	215.00	0.00	0.00
	Total – EMC	883.00	489.36	55.42	763.00	0.00	0.00

Source: Planspace

The Way Forward

For the healthy growth of the power sector and to formulate agreed policies and programmes, there should be close and constant interaction and better coordination among different organisations of power industry. Better synergy between the sister concerns like KSEBL, ANERT, EMC and Electrical Inspectorate through comprehensive plan like Oorjja Kerala Mission will develop the energy sector in the State to truly global standards by 2021.

The State of Kerala has fulfilled the objective of total electrification and state distribution grid is now capable of providing power on demand in any inhabited locality, within a matter of hours and that too at reasonable cost without power cut or load shedding. Despite the oppressive

environment, KSEBL was able to explore opportunities in power market including power exchanges. The power purchase cost of KSEBL including internal generation is only Rs 3.30/unit for year 2019-20. Adequate power is tied up by KSEB Ltd. to meet the base demand. For shortages during evening peak hours during summer KSEBL has successfully utilized banking of power from other utilities. Adequate arrangements are planned for successive years as well.

KSEBL is considering all option to harness renewable power and to be competitive in this field. Besides development of solar power through Soura projects, all other sources are expedited. The target is to meet 40 per cent of energy requirements from Renewables by 2022. It is planned to enhance renewable capacity by 1829 MW and another 700MW through contracts by 2021-22. 780 MW Idukki extension scheme is also in the anvil. **This** will enable KSEBL to be flexible in planning a suitable mix to meet load requirement. Through Transgrid 2.0, transmission lines are designed in such a way that, they requiring minimum or even no additional land / RoW. Modern Gas Insulated Substations were adopted to minimise land requirement of Substations. The new 400kV Tirunelveli – Kochi – Trichur –Udumalpet power high way and ongoing extension of Raigargh-Pugalur HVDS to Trichur is expected to improve the power import capabilities of the State by 2800 MW.

The flood of 2019 together with Covid-19 pandemic onslaught has widened the ACS-ARR gap in 2019-20. The ACS-ARR gap is Rs 0.197 per unit. KSEBL was able to increase its revenue in the past years and flattened the expenditure curve. On calculating the loss as the percentage of revenue it may be noted that operational loss is within tolerable limits. Sufficient cash flow is ensured for the operation of KSEBL. Also KSEBL never required external support to meet losses. The State of Kerala is one among the first in India, which declared its e-mobility Policy. Considering the preparedness of KSEB in this regard, the State Government has designated KSEB as the State nodal agency to ensure deployment of e-Vehicle charging stations across the State. KSEBL is moving in the right track to meet the challenge. With completion of the 62 charging stations targeted this year and another 181 stations proposed for coming years, a state wide base network for vehicle charging will be created.

By replacing all filaments lamps and fluorescent lamps and tubes in domestic sector and street lights by its variant, energy efficient, long lasting LED lamp and tubes through Filament free Kerala programme, State envisages a reduction in evening peak demand and reduced CO2 emissions and capturing Hg from going to earth. The State has already ventured into energy efficiency lighting by distributing over 1.35 crore LED lights in Domestic Efficient Lighting Programme as part of Demand Side Management. All these measures stress the commitment of utility to a clean environment for sustainable development.

KSEBL as a public utility gave first priority to the aspiration of lakhs of consumers under lock down. For many, when their long-term savings was eroded during the lock down and has no income to spend, KSEBL lent a helping hand to support those who are in need by announcing relief measures for consumers to alleviate miseries of lockdown. The utility has normalised its operations post lockdown. Despite losses, the utility is under transformation to coexist with Covid-19 pandemic by modernizing its services for maintaining Covid- 19 protocol and reaching out for customers at their door steps. As described above KSEBL is prepared to meet the challenges and issues in power sector by improving its operational efficiency without privatisation and is set to

achieve global standards through Oorjja Kerala Mission. The successful experience of Kerala model of restructuring emphasizes the importance of existence as an integrated utility for effectiveness of services and on the other hand attaining efficiency and more financial control by vertical unbundling into strategic business units. As a public utility KSEBL achieved equitable distribution of electricity everywhere in the state at affordable cost and has evolved as a sustainable model.

The Government's top most priority is to increase power generation to ensure availability of power to match the increasing demand. At the same time, quality of power is also of equal importance. The non-conventional sources of energy need to be utilised to the maximum extent possible in meeting our energy requirements. Electricity generation from wind, solar photovoltaic, small and medium hydro projects should be tapped to its full potential. To ensure adequate economic and social growth in any country, it is indispensable that all available energy sources be used in the most effective and economical manner, particularly for the generation of electricity.

CHAPTER 6.2

ENVIRONMENT AND GROWTH: ACHIEVING THE BALANCE

Introduction and Overview:

The challenge of sustainable development which is at the heart of the conundrum that the title expresses is not particular to any nation, region, landscape or ecosystem. It is a pervasive challenge that policy-makers must appreciate is not easily met. Unfortunately in the era of the Anthropocene, with the sense of urgency arising due to the problem of global warming, the tendency has been to argue that solutions are readily available, if only the requisite political will is summoned. Global experience shows that this is hardly the case. Sustainable development involves such a comprehensive re-ordering of the productive capacities of society as a whole, and that too eventually on a global scale that such simplistic views are clearly misplaced. In reality, sustainable development can only evolve as a process, an evolution that must include the local and the global, that must involve thinking through what is to be done at multiple time scales and that must be prepared to face both uncertainty and the possibility of making errors as this evolution proceeds. Nor can the solutions be purely drawn from either the social, the economic or the scientific dimensions of the problem, but most involve all such aspects in interconnected fashion.

Popular enthusiasm for environmental action and sustainable development is certainly, and quite justifiably, on the increase. However, such enthusiasm, unless suitably guided, is in danger of missing the scientific and technological dimensions of the problem or the complexity of the economic issues. Typically, popular enthusiasm, especially in developing societies, but even in the developed world, is drawn to the romantic notion that downgrading technological advance is the key, or to the equally romantic view that simply restricting consumption of material goods, with some ascetic ideal of saving the planet, will be sufficient. Such romanticism is clearly misplaced in societies that still harbour grave social and economic inequalities and where the leading question is not the restriction of the over-consumption of material goods but the absence of the guarantee of the availability of elementary or basic material needs. Other tendencies include the idealisation of traditional knowledge when in fact the current challenge of sustainable development has no parallel in the past and hence traditional knowledge is indeed relatively powerless to deal with contemporary realities. Thus communities that depend on traditional knowledge for their basic sustenance are far more likely to be victims of large scale ecological transformations rather than the harbingers of means to deal with such transformations.

These challenges are common to the vast majority of nations and societies. However, in developing societies such as India the challenge of sustainability has a dual aspect that must be noted. Both aspects are associated with inequality, but there is a need to note that inequalities in countries like India arise from both international as well as domestic inequalities. This is particularly relevant to global environmental questions such as climate change, where recognition of global inequalities is fundamental to the understanding of both the problem and its solution. Regrettably the moral attitude to the environmental challenge, calling for renunciation of material

development even by the very poor, or the reduction of their civilization aspirations to the mere provision of three square meals a day, has gained considerable traction in policy circles.

Thus it must be understood that sustainable development would be straight forward if the significance of both the words were not given due weightage. Second, especially in developing societies the development of productive capacities cannot be short-circuited or set aside in the name of sustainability. Third, the challenge of environmental sustainability and development can only be overcome with the greater use of science and technology and not by a retreat from it.

Fourth, science is also the indispensable ally and foundation on which to build further beyond traditional knowledge, from which there may be many things to learn. But science is also indispensable to separate the grain of valid experiential knowledge from the chaff of hearsay, prejudice or plain obscurantism. Fifth, without science as a guide, popular enthusiasm for environmental protection may also slip into an alarmist mode that cannot but have a retrogressive impact not only on development, but on society as a whole.

Sixth, the importance of science has been recently re-emphasised by the COVID19 pandemic and the discussions that have ensued over its origins, the means to contain its impact and the need to monitor and, to the extent possible, guard against such zoonotic outbreaks. On another front the impact of the recurrent floods and landslides over the previous two years, preceded by an unprecedented drought, have also brought home the need for science-based study and intervention, to build resilience to climate extremes in the era of climate change.

These comments and observations are obviously not exhaustive but are made keeping in mind not only their general validity but also their relevance to Kerala in particular.

Kerala and its Environment:

Kerala is one of the States of India where the development-environment connection thrusts itself on life, society and governance in inescapable fashion. The landscapes and ecosystems of the State are unique in many ways due to the particular features of its geography and climatic conditions.. Kerala is one of the country's and world's distinctive biodiversity hotspots. It has all the three maximally productive and biodiversity rich ecosystems in the world, namely tropical rainforests, freshwater and brackish water wetlands, and the marine coral reefs. There has been progressively rising pressure on the environment and the natural resources of Kerala over the years from the high density of population as well as the State's developmental needs.. The serious consequences of this pressure are becoming increasingly evident. Development in Kerala has to ensure, utilising the best of ongoing scientific and technological development, that the demands on the environment do not exceed its carrying capacity for the present as well as future generations.

The State of Kerala may be justifiably proud of the high level of popular awareness of environmental issues. Environmental consciousness is all pervasive in Kerala society, and related issues are debated intensely in the public sphere, extending well beyond the narrow confines of an intellectual elite. However, it is not always evident that such consciousness or awareness is matched by an adequate scientific and technological appreciation of the issues involved and the

recourse to science to solve these issues. In the absence of adequate scientific inputs, there will be an inevitable slide into conservation privileging or even over-riding developmental efforts. It needs to be emphasised that even the notion of carrying capacity is not a static one and that science and technology can actively develop and enhance the carrying capacity, including the biocapacity, of any given landscape or ecosystem.

With a scientific outlook guiding all activities in the environmental sphere, many of the decentralized institutions envisaged and set up for environmental governance, such as Biodiversity Management Committees, may be provided specific and concrete agendas of work, in monitoring various specific aspects of the environment. This would be a valuable way in which popular enthusiasm can be used to promote scientific information gathering and data collection, with appropriate training. To date, all over India, it has proven difficult to provide focused, active work to the BMCs beyond the initial effort to list and catalogue various environmental assets at the local level in the preparation of the Peoples' Biodiversity Registers. In the absence of a definite work agenda, BMCs may tend to become local lobbyists for environmental protection of whatever form that may strike their fancy, thus creating local level conflicts rather than a cooperative understanding.

At the level of governance, the Environment (Protection) Act was enacted in 1986 with the objective of providing for the protection and improvement of the environment. It empowers the Central Government to establish authorities charged with the mandate of preventing environmental pollution in all its forms and to tackle specific environmental problems that are peculiar to different parts of the country. The Act was last amended in 1991. This necessitated a State Policy Statement with the objective of complementing and supplementing the National Strategy and Policy. Kerala Environment Policy came into existence in 2009. This Policy document provides a framework within which conservation and development can be achieved simultaneously with a view to maximizing the quality of life for all in the State, optimizing the ecological load on the natural systems as well as building up the State's economy while minimizing environmental degradation.

One of the key achievements of the present government of Kerala has been its own particular addition to the raising of environmental awareness and action through the Haritha Keralam Mission. As the umbrella terms for a vast variety of local initiatives, the Haritha Keralam initiative has raised the bar on environmental awareness building in the country. However, the reach of the Mission as well as environmental work in general in the State, would be considerably enhanced if there were proper specialisation by various government departments and agencies in their roles in environmental protection. Unfortunately there continues to be considerable duplication of efforts across these, with the opposite extreme from silo-based thinking where everybody is involved in everything. Specialisation and the delineation of specific roles are essential if effective environmental action has to happen.

Climate Change and Kerala:

Climate change poses an emerging challenge to sustainability of social and economic development, livelihoods, and environmental management across the globe. The rise in Green House Gases (GHGs) in the atmosphere causes rise in temperature which in turn leads to unpredictable weather including flash floods and drought, and rise in sea level. So far as India is considered, the country is highly vulnerable to climate change because of high physical exposure to climate related disasters (65 per cent is drought prone, 12 per cent is flood prone, 8 per cent susceptible to cyclones) and also the India's economy and population depends on climate sensitive sectors like agriculture, forests, tourism and fisheries. India had started its work on action plan in 2007 and the National Action Plan for Climate Change (NAPCC) was released in October 2008. The National Action Plan for Climate Change (NAPCC) sets eight National Missions to respond to climate change; these include National Mission on Solar Energy, Enhanced Energy Efficiency, Sustainable Agriculture, Sustainable Habitat, Water, Sustaining Himalayan Eco-System, Green India Mission and Strategic Knowledge for climate change covering range of actions including adaptation and mitigations. The principles adopted for the National Action Plan for Climate Change (NAPCC) include achieving sustainable development path while advancing economic and environmental objectives.

Subsequent to the introduction of National Action Plan on Climate Change (NAPCC) in 2008, State Governments were also encouraged to prepare their own State Action Plan on Climate Change (SAPCC) consistent with strategies in the National Action Plan for Climate Change (NAPCC). The first Kerala State Action Plan on Climate Change was drafted by the Directorate of Environment and Climate Change (DoECC) with inputs from relevant Departments, Agencies and Research Institutions. This was endorsed by the Government of India in 2014. It is proposed to identify specific vulnerabilities and plan appropriate responses keeping those in focus. As the foremost impact of the changing climatic pattern relates to the land and water resources, a system for monitoring will be the first imperative. Thus the SAPCC will build on the existing policies of the state government by taking into consideration the ongoing programmes and schemes being implemented at the state level as well as the National Action Plan for Climate Change (NAPCC). The State Action Plan on Climate Change (SAPCC) will have to be integrated into the state level planning process so that the resource allocation of the implementation of identified adaptation measures can be made with the objective to achieve the development goals of the state government. Adaptation is a key part of Kerala State Action Plan on Climate Change and it is about taking action now to protect state from the challenges caused by a changing climate. The Kerala State Action Plan on Climate Change developed by the Department of Environment and Climate Change, Government of Kerala aims to address negative consequences of climate change and thus reduce risk associated with it. It is also envisaged that climate change strategies need to be integrated into the development planning process in the State.

However, in many ways, climate action in Kerala is still in its infancy. While there is a SAPCC for Kerala there is little buying into this Action Plan by various Departments and agencies of the State Govt., as well as other stakeholders. This is the inevitable consequence of consultant driven processes that conduct proforma stakeholder meetings that rarely go beyond the superficial. Efforts to have a more systematic input from academic and research institutions in Kerala into

the second edition of the SAPCC based on adequate knowledge capacity building and peer review, with the active participation of government departments as well has to still to bear fruit.

It is necessary in formulating Kerala's response to climate change that it meshes in appropriate fashion with national policy. There is no case here for the competitive evaluation of different States in their meeting the challenge of climate action. In a national economy, resource sharing and cooperation in sharing the ecological burden is the key and not a competitive approach. While tapping local enthusiasm is important, slogans such as carbon neutrality of particular regions or even local jurisdictions as small as a panchayat is not in accordance with national policies. But formal adherence to national policy goals apart, such goals are not even entirely coherent. Kerala's significance lies in the preservation and enhancement of its forest and tree cover and the protection of its coastal ecosystem. The adaptation of its ecosystems and landscapes to global warming is the key challenge for Kerala, and local mitigation efforts such as the carbon neutrality of particular panchayats is simply diversion from the real effort that is required, whatever its populist appeal. Regrettably, such local mitigation efforts are likely to attract some modest funding adding to their appeal. But most of such funding is part of the larger policy initiatives from developed countries to persuade local jurisdictions to undertake commitments that have been rejected by the country at the policy level in international climate negotiations.

Environmental Regulation in Kerala:

In this section we deal with a number of specific aspects of environmental regulation in the State of Kerala.

Ban on Single Use Plastic

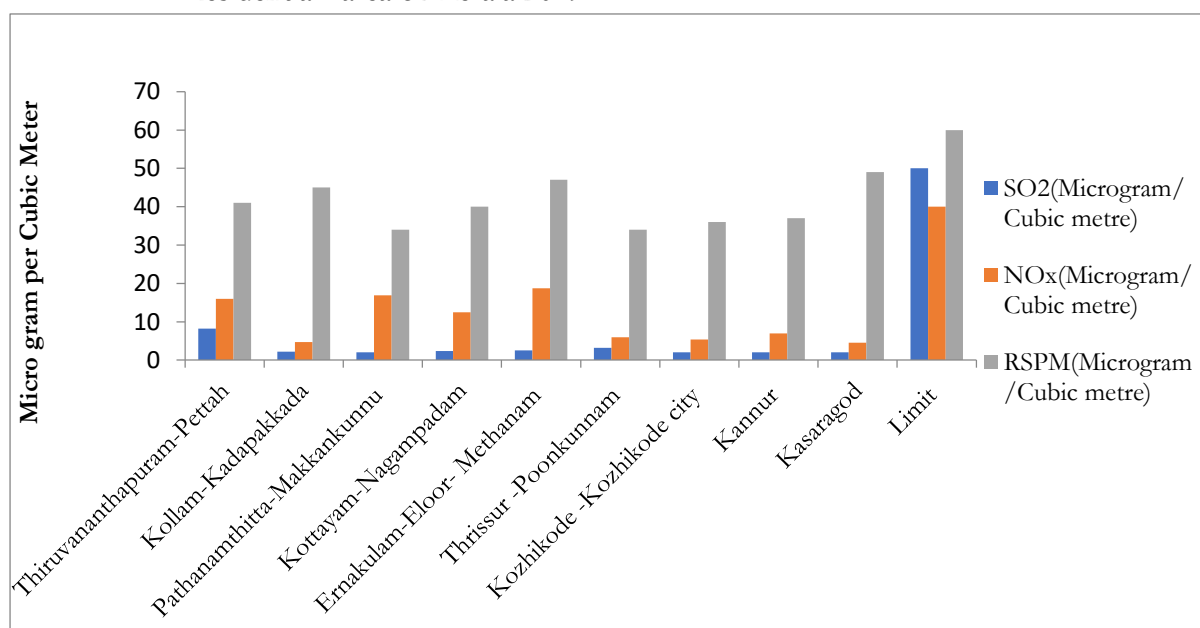
A ban on single-use plastic come into force from January 1, 2020. With the Plastic Waste Management Rules (2016) the State Government imposed strict restrictions on the use and sale of plastic carry bags less than 50 microns to facilitate collection and recycle of such plastic. The State Government has already taken steps with regard to setting up of facilities for collection, segregation and disposal of all forms of waste, including plastic waste. Even so, the uncontrolled and irresponsible usage of plastic has been posing environmental as well as health hazards. Plastic items mostly end up in rivers and water bodies, making even recycling impossible. The ecological system, and marine ecology in particular, have been badly affected. The grim situation was never been more evident than after the floods in Kerala. Mountains of plastic debris were washed up on the shores of the sea and lakes. The Government appointed an Expert Technical Committee to list the plastic items to be banned and find substitutes for them. The Expert Technical Committee submitted its report to the government recommending partial ban on some items like PVC and flags, and has recommended regulating the use of a many other items through establishing a return-and-earn scheme.

Air Quality Monitoring

The Kerala State Pollution Control Board monitors ambient air quality at 34 stations in the State. Of these, 28 stations come under the National Ambient Air Quality Monitoring Programme (NAMP). It includes four new stations established in 2019-Thiruvalla (Pathanamthitta), Kuttipadam (Ernakulam), Perinjadoor (Thrissur) and Kalpetta. The State Ambient Air Quality Monitoring Programme (SAMP) is implemented at seven stations, including a new station established in 2019 in Moovattupuzha. A PM 2.5 sampler was installed at each of the 19 Air Quality Monitoring stations during 2018-19. Seventeen RDS and PM 2.5 samplers for ambient air quality monitoring and eight for measuring microbalance were purchased in 2019-20. The latter were installed at district offices in Thiruvananthapuram, Alappuzha, Ernakulam, Wayanad, Kannur, Perumbavoor, Kollam and Thrissur.

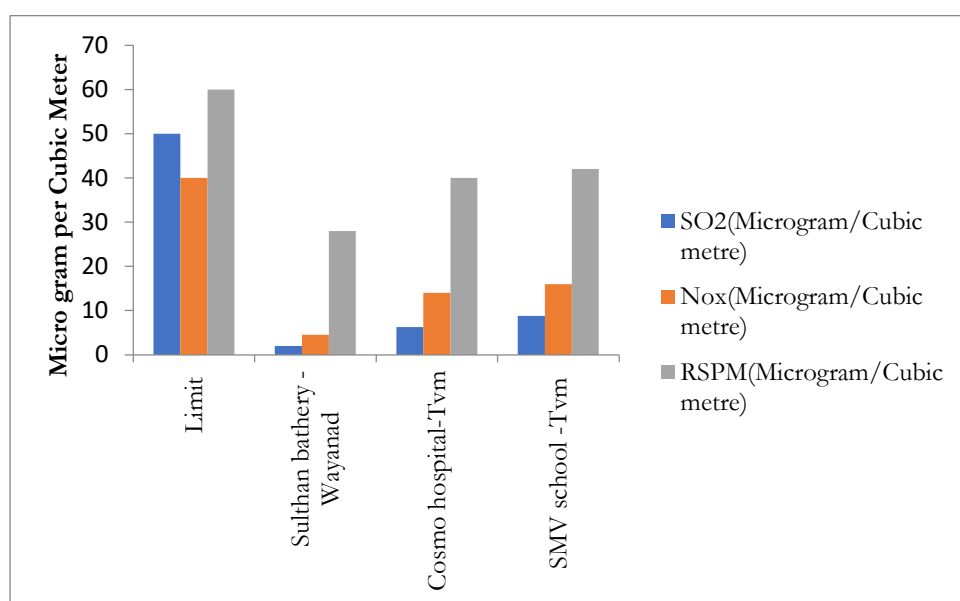
The Kerala State Pollution Control Board had established and commissioned Continuous Ambient Air Quality Monitoring Stations (CAAQMS) at Kozhikode (one station) and Ernakulam (two stations). In 2019-20, the Board established and commissioned CAAQMS at Kollam, Thrissur and Kannur. Various ambient air quality parameters are monitored continuously and displayed to the public.

Figure 3.7.1 Annual average values of air pollutants at 10 monitoring stations in “Residential” area of Kerala 2019



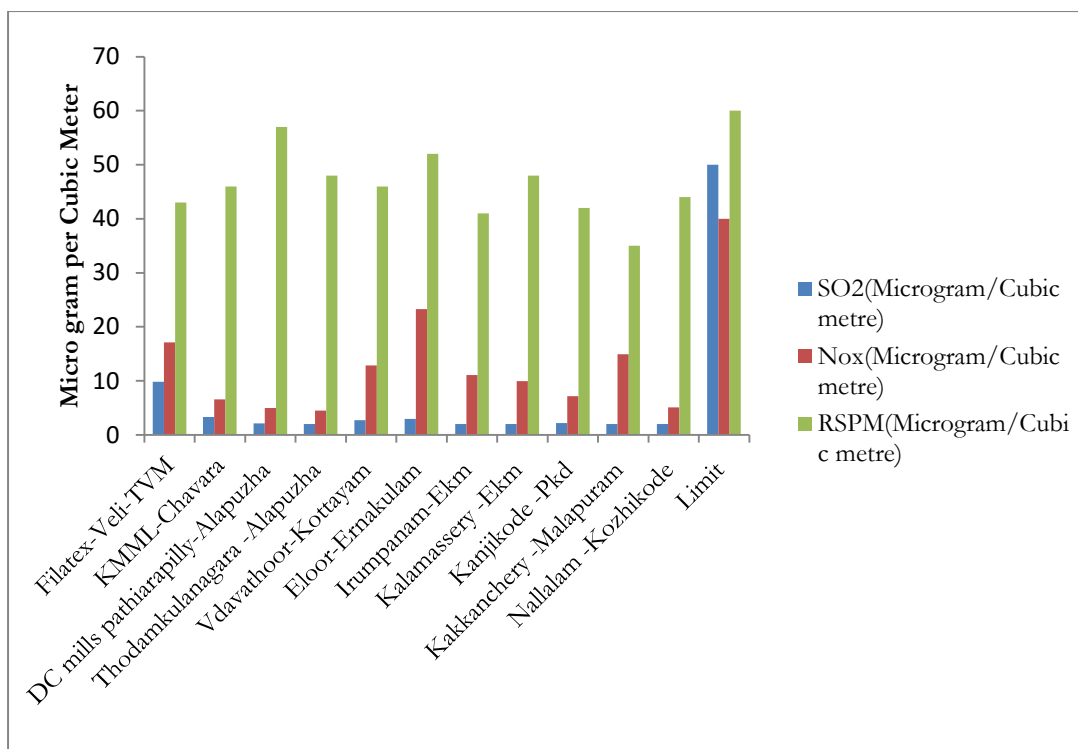
Source: Water and Air Quality Directory 2019 ,KSPCB

Figure 3.7.2 Annual average values of air pollutants at three monitoring stations in “ Sensitive” areas of Kerala 2019



Source: Water and Air Quality Directory 2019 ,KSPCB

Figure 3.7.3 Annual average values of air pollutants at 11 monitoring stations in “ Industrial” areas of Kerala 2019



Source: Water and Air Quality Directory 2019 ,KSPCB

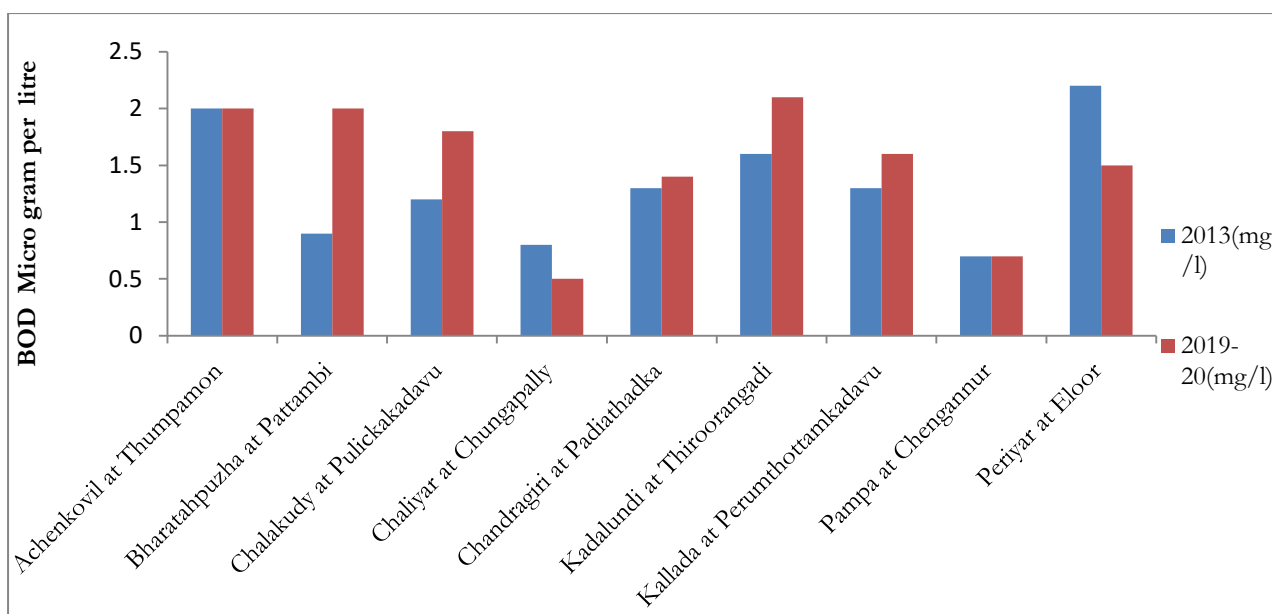
Water Quality Monitoring

A total of 128 water Quality Monitoring Stations function under the National Water Quality Monitoring Programme (NWMP). Under this programme are included 72 stations in 48 rivers (major, medium and minor rivers), six in reservoirs, three in fresh water lakes, eight in estuarine lakes, three in canals, two in ponds and 34 in ground water. The State Water Quality Monitoring Programme (SWMP) operates at 115 stations in 23 rivers and 23 stations in four lakes.

Some of the rivers having high BOD values are River Pamba (during Sabarimala festive seasons) and downstream of River Karamana, Periyar, Bharathapuzha, Vamanapuram and Kadalundi. Coliform counts at Munnattumukku in Karamana River, Kallayi bridge in Kallayi River, Pamba River, Purakatteri in Korapuzha river, Thodupuzha river and Munnar river are reported as being very high. .

With regard to rivers, the BOD is plotted in Figure 3.7.4. It shows that BOD is highest for Periyar (higher than the 2013 levels). Bharathapuzha and Chalakudy rivers showed an increase in BOD levels compared with 2013. Achenkovil, Kallada and Pamba rivers show a drop in BOD levels as compared to 2013 level.

Figure 3.7.4 BOD levels at selected river stations for 2013 and 2019



Source: Water and Air Quality Directory 2019 ,KSPCB

Surveillance of Sabarimala during pilgrimage season

During the Sabarimala pilgrimage season, the Board has to ensure quality of drinking water supply in the pilgrimage area. For this purpose a laboratory is provided at Pamba. Besides continuous river water quality monitoring at different locations, sampling from effluent treatment plants are also done for ensuring good environmental conditions. Ambient air monitoring and noise monitoring are also done at Camp offices setup at Sannidhanam, Pamba and Erumeli with sufficient sampling as well as laboratory staff for this purpose. The Board has conducted various awareness programmes among the public. Plastic carry bags, canned food and bottled water in the pilgrimage area are banned.

Biodiversity in India and Kerala

India has done well in raising awareness about biodiversity, which is an important thrust area in several programmes of the Government. As a megadiverse country holding nearly 7-8 per cent of globally recorded species while supporting 18 per cent of the global human population on a mere 2.4 per cent of the world's land area, India's quest for inclusive economic development while maintaining the integrity of its natural capital is being pursued through various programmes and strategies.

India has been investing a huge amount on biodiversity directly or indirectly through several development schemes of the Central and State Governments. This runs to Rs. 70,000 crores per annum as against the estimated annual requirement of nearly Rs.1,09,000 crores. India has nearly two third of the population of wild tigers in the world. The population of lion has risen from 177 in 1968 to over 520 in 2015, and elephants from 12,000 in 1970s to 30,000 in 2015. One-horned Indian Rhino which was on the brink of extinction during the early 20th century, now number 2400. Further, while globally over 0.3 per cent of total recorded species are critically endangered, in India only 0.08 per cent of the species recorded are in this category.

A little more than two-thirds of India's geographical area is arid, semi-arid or dry sub-humid on which depend a vast majority of rural and semi urban poor for their livelihoods. Studies have repeatedly emphasized that the rural poor and particularly women are severely impacted by the effect of environmental degradation on soil fertility, quantity and quality of water, air quality, forests, wildlife and fisheries.

However, while biodiversity conservation is well understood, there is still much to be understood of the economic value of biodiversity and how exactly it is to be valued and enhanced. Such confusion is of course not merely restricted to Kerala or even India but is a global problem.

Biodiversity Management Committee (BMC) for Conservation

Kerala State Biodiversity Board had constituted Biodiversity Management Committees (BMCs) in all Panchayats, Municipalities and Corporations during 2012. After the local body elections, BMCs were reconstituted during 2015-16. During 2019-20 KSBB initiated constitution of BMCs in the remaining upper two tiers of Panchayati Raj systems in the State namely, in Block Panchayats and District Panchayats. The process of BMC constitution in 152 Block and 14 district Panchayats were completed during December 2019. During the 13th Five-Year Plan, it was aimed to strengthen the BMC through capacity development and policy support to sustainably manage the natural resources at local level. During 2017-18, 20 BMCs were selected, and during the reporting period 28 model BMCs were selected (two from each district) and they are being empowered and provided financial support for focused projects.

Implementation of People's Biodiversity Register (PBR)

The PBR is a comprehensive document on biodiversity prepared with the support of Kerala State Biodiversity Board and Technical Support Groups (TSG). In 2019-20, a total of 75 PBRs has been prepared. The process of compiling PBRs of the locality along with associated traditional knowledge prepared by BMCs with technical preparation was completed in all 1034 local bodies i.e. in 941 Grama Panchayats, 87 Municipalities and six Corporations.

Impact of flood and natural disasters on biodiversity

The Kerala State Biodiversity Board had conducted a rapid assessment of the impact of floods on biodiversity through BMC during 2018. This revealed that about 771 different landscapes, including riverine, forest, plantations and agricultural fields were affected. About 287 varieties of

agricultural crops, 1053 types of flora and 695 types of fauna were affected. The major causes of disaster were found to include changes in land use in wetland areas, removal of river bank vegetation, construction activities on hill slopes and unsustainable quarrying. As a follow-up to this, areas requiring attention was prioritized and 28 studies on the impact of floods/ landslides on biodiversity and ecosystems with special emphasis on riverine rejuvenation were awarded to R&D institutions and universities across Kerala. As an outcome of this study, the Periyar, Pamba, Bharathapuzha and Chalakudy river areas have been prioritized for recovery measures. The management and control of soil erosion at selected areas of the Pamba river have been taken up. Areas vulnerable to landslides have been identified and the regeneration of riparian vegetation has been prioritized as part of the recovery process.

Major initiatives and activities of the departments

The Indian Constitution directs the State to “take measures to protect and improve the environment and to safeguard the environmental quality”. It also makes it a fundamental duty of every citizen to protect and improve the natural environment including forests, lakes, rivers and wildlife.

The Directorate of Environment and Climate Change in Kerala provides environmental education and awareness through their programmes like ***Paristhithikam* and *Bhoomitrasena Clubs***. *Paristhithikam* focuses on conducting awareness and activity-oriented programmes under the theme “Fight against Air Pollution”. Presently there are 369 BMCs functioning in various Higher Secondary Schools/ Colleges all over Kerala to create and promote environmental awareness among the students.

The major initiatives of Directorate of Environment and Climate Change in 2019-20 were as follows:

- Water quality monitoring programmes were conducted in different water bodies, including drinking water sources in the flood affected regions and its potability and/or suitability of use ascertained by selected BMCs
- Environmental awareness and action-oriented environmental conservation programs were conducted in different parts of the State under the title “*Paaristhithikam*” based on the theme “Combating Air Pollution”.
- A project titled ‘Grid connected solar powered charging station for electric vehicles’ for the promotion of sustainable energy in the automobile sector was initiated.
- Documents on wetlands namely (i) Kavvayi, (ii) Kattampally, (iii) Kadalundy, (iv) Kottuli, (v) Pookode (vi) Ponnani estuary/Purathur (vii) Chetuvai kayal (viii) Paravur (ix) Vellayani was prepared by *Centre for Water Resources Development and Management (CWRDM)* for State Wet Land Authority Kerala.

The Kerala State Biodiversity Board established the Biodiversity Museum in Vallakkadavu, Thiruvananthapuram to create awareness among the people on the importance of biodiversity and conservation. Biodiversity clubs play a great role in furthering biodiversity education and experiences related to the nature and environment outside the class room. A total of 150

biodiversity clubs were newly registered during the year. Altogether there are 1715 registered biodiversity clubs in Kerala. The Kerala State Pollution Control Board has taken initiatives for the implementation of the Kerala Anti-microbial Resistance Strategic Action Plan (KARSAP) in the State.

ABBREVIATIONS

BMC: Biodiversity Management Committees

BOD: Biochemical Oxygen Demand

CAAQMS: Continuous Ambient Air Quality Monitoring Stations

CWRDM: *Centre for Water Resources Development and Management*

DoECC: Directorate of Environment and Climate Change

KARSAP: Kerala Antimicrobial Resistance Strategic Action Plan

KSBB: Kerala State Biodiversity Board

KSPCB: Kerala State Pollution Control Board

NAMP: National Ambient Air Quality Monitoring Programme

PBR: People's Biodiversity Register

SAMP: State Ambient Air Quality Monitoring Programme

SAPCC: State Action Plan on Climate Change

TSG: Technical Support Groups

SWMP: State Water Quality Monitoring Programme

NAPCC: National Action Plan for Climate Change

NWMP: National Water Quality Monitoring Programme

CHAPTER 6.3

OVERCOMING FISCAL CONSTRAINTS TO GROWTH

1. INTRODUCTION

1.1. Changing Nature of Fiscal Federalism

According to the Constitution, India is a Union of States. Articles 268-293 of the Constitution of India divided the financial relations between the Union and State governments on the basis of principles of financial autonomy, revenue elasticity and notions of equity and economy. Accordingly, under Article 246 of the Constitution, there are three Lists, namely, the Union List, the State List and the Concurrent List.

The important taxes listed in the Union List or those assigned to the Centre are taxes on income other than agricultural land, duties of custom, duties of excise except those on alcoholic liquor for human consumption, corporation tax, estate duty in respect of property other than agricultural land amongst others. The important taxes listed in the State List are land revenue, taxes on agricultural income, taxes on land and buildings, taxes on mineral rights, alcohol and electricity.

A detailed analysis of subjects in the Union and State lists present the picture of the States being burdened with the responsibilities of all-important subjects such as public order, agriculture, irrigation, public health and sanitation, roads and bridges along with a significant expenditure on subjects such as education, administration of justice, contracts, forests, economic and social planning. On the fiscal front, there is an asymmetry between the taxation powers and the functional responsibilities. While the Centre is assigned with taxes with higher revenue potential, States are assigned with more functional responsibilities.

To address the issue of a gap in the resources assigned to States and their expenditure responsibilities, the Constitution provides an institutional mechanism in the form of a Finance Commission under Article 280 and other enabling provisions in the form of statutory grants under Article 275 and discretionary grants under Article 282 for the transfer of resources from the Centre.

However, the recent trends in fiscal federalism indicate a transition towards a unitary tendency within the fiscal realm. The advent of GST council in accordance with Article 279A has deeply disturbed the fiscal autonomy of the States by reversing the

spirit of fiscal decentralization enshrined in our Constitution. With the Union having weightage of one-third of the total votes cast, and when it requires not less than three-fourths of the weighted votes of the members present and voting to take a decision, the Centre holds an effective veto in deciding the indirect tax structure of the economy.

To mitigate the loss of revenue for the states on account of introduction of GST, for the first five years, a compensation cess was brought in under section 18 of the 101st Constitution Amendment Act. This guarantee, however, has not been inserted in the Constitution. A separate GST (Compensation to States) Act, 2017 was enacted to provide for compensation to States for five years in return for the revenue losses suffered by them owing to the implementation of GST.

Under Article 279A(11) of the constitution, the GST Council must establish a mechanism to adjudicate between the Centre and one or more states if they Centre fails to disburse the compensation to States. However, no steps have been taken to create such a dispute resolution mechanism even in the wake of Covid 19 pandemic and the ongoing economic crisis. Moreover, the Comptroller and Auditor General has found that the Union government in the very first two years of the GST implementation wrongly retained ₹47,272 crore of GST compensation cess that was meant to be used specifically to compensate states for loss of revenue. All these point towards an alarming erosion of the essence of fiscal federalism in the Constitution. The imposition of various cesses and surcharges by the Centre have severely curtailed the fiscal autonomy of the States. Constitutionally, tax revenues are to be shared according to the Finance Commission awards while the collections from cesses and surcharges are not shareable with the states.

The FRBM Act, 2003 was brought in to pursue a fiscal consolidation path while adhering to the notion of economic growth and social equity. However, the rigid adherence to the FRBM Act, 2003 during the period of economic turbulence and resource shortages have derailed the economic prospects of States such as Kerala who are suffering the fiscal setbacks created by consecutive floods of 2018 & 2019 and Covid-19 pandemic.

It is to be noted that the FRBM Act doesn't specify a well-defined escape clause for States in the event of an economic emergency as it does with the Centre. Therefore, the States are dependent on Centre's approval for deviating from their fiscal targets even during extraordinary situations such as recessions, famines or pandemics. Though, the Centre has recently relaxed the FRBM borrowing limits of States from 3% to 5% of GSDP, the increased borrowing space is mostly linked to reforms to be undertaken by the State governments. Linking the fiscal spaces of States to unilaterally imposed reforms amidst an ever-expanding economic crisis points to the new era of coercive federalism in the Indian polity.

This has forced States such as Kerala to resort to off-budgetary operations to meet their expenditure requirements. KIIFB model of Kerala assumes importance in this context of rigid FRBM framework of fiscal consolidation. Kerala has been driving its infrastructure programmes via the KIIFB route thereby bypassing the stringent framework imposed by FRBM Act. Despite the smart alternative path that KIIFB offers the government, it has to be agreed that there needs to be greater public accountability in terms of the finances of KIIFB especially in a vibrant political democracy.

An equally disturbing tendency that has emerged in the fiscal federal set-up has been the increasing intrusion of Centre into the State lists. It is observed that a large part of the revenue expenditure of the central government is spent on State and Concurrent lists subjects with a corresponding decline in expenditure on Union List subjects. (*Chakraborty, P et al (2018): "A Study of Intergovernmental Fiscal Transfers in India," Project Report, National Institute of Public Finance and Policy, New Delhi*). The encroachment by the Centre into the sacred division of powers enshrined by the Constitution is widely considered as a curtain-raiser towards the centralization of fiscal and legislative powers at the Union level.

1.2. *Relevance of Governmental Economic Policies*

Fiscal measures are frequently used in tandem with monetary policy to achieve the economic goals of the state. Fiscal policy pertains to the measures employed by governments to stabilize the economy, specifically by manipulating the levels and allocations of taxes and government expenditures. Government finances influence economic development in numerous ways. In a quasi-federal political structure, the role played by fiscal policies of State governments will substantially influence allocation and distribution of resources within the economy. Moreover, the quality of government expenditure represented by higher budgetary spending on productive capital investments can positively influence social and physical infrastructure of the economy. Fiscal policy represents an important tool in smoothening the cyclical

movements in the economy as portrayed by the recent crisis caused by Covid-19 pandemic.

In 2016, the government constituted the Monetary Policy Committee with a mandate to contain inflation at 4% (tolerance level of 2%) in the medium run. In pursuance of the tight and cautious monetary policy by RBI has dampened the investor sentiments in the key sectors such as MSME, construction and infrastructure sectors.

Maintenance of fiscal discipline by state government is of paramount importance not only from the point of view of macroeconomic stability but also to ensure adequate funding of essential social and economic services as well as building the foundations for long-term sustainable economic growth. In the event of COVID-19 pandemic, consecutive floods in 2018 and 2019 and changing nature of fiscal federalism, Kerala is entering an era of heightened economic uncertainty. The state government is facing unpredictable revenue and expenditure on the one side while experiencing ever-expanding costs of rebuilding the economy.

In this context, the objectives of the present report are essentially three-fold:

- i. To examine the trends in the various fiscal indicators of Kerala economy over the period from 2010-11 to 2019-20
- ii. To identify the major fiscal constraints which are inhibiting the economic growth of Kerala
- iii. To suggest the necessary policy initiatives to overcome the fiscal constraints of Kerala by looking into prudent fiscal management practices across the political spectrum.

2. PERFORMANCE OF MAJOR FISCAL INDICATORS IN THE STATE

In this section, we present the trends of various fiscal indicators in the State Finances during the period from 2010-11 to 2019-20. The fiscal indicators are studied from the perspective of parameters namely fiscal imbalances, expenditure management and revenue performance. By analyzing the trends in fiscal imbalances, the report aims to understand the major constraints affecting the sustainability of Kerala's state finances and thereby derailing the prospective economic growth and rebuilding of the economy.

I. Receipts

Revenue and capital are the two streams of receipts that constitute the resources of the State Government. Revenue receipts consist of Tax revenues, Non-tax revenues, State's share of union taxes and duties and Grants-in-aid from the Government of India. Capital receipts comprise of miscellaneous capital receipts such as proceeds from disinvestments, recoveries of loans and advances, debt receipts from internal sources (market loans, borrowings from financial institutions/commercial banks) and loans and advances from Government of India. Trend in receipts from 2010-11 to 2020-21 are shown in Table 2.1.

Table 2.1. Trend in Total Receipts (₹Crores)

Year	Revenue Receipts	Capital Receipts	Total Receipts	Growth Rate of Total Receipts (in per cent)	GSDP (at current prices)	Receipts-GSDP Ratio (in per cent)
2010-11	30991	7807	38798	13.75	324513	11.96%
2011-12	38010	12284	50295	29.63	364048	13.82%
2012-13	44137	15685	59823	18.94	412313	14.51%
2013-14	49177	17050	66226.79	10.7	465041	14.24%
2014-15	57950	18719	76669.62	15.77	512564	14.96%
2015-16	69033	17965	86997.95	13.47	561994	15.48%
2016-17	75611.73	26762.51	102374.2	17.67	634886	16.12%
2017-18	83020.14	27221.28	110241.4	7.68	701577	15.71%
2018-19	92854.47	27241.61	120096.1	8.94	781653	15.36%
2019-20 (RE)	99043	26300.36	125343.4	4.37	871534	14.38%
2020-21 (BE)	114635.9	29575.93	144211.83	15.05	978064	14.74%

Source: Medium Term Fiscal Policy and Strategy Statement 2020-21-2022-23, GoK

It can be seen that the total revenue of Kerala as percentage of GDSP at current prices has not witnessed any upward trend except for a brief period between 2014 and 2016. This fall in revenues can be attributed to decline from both own revenue (both tax and non-tax) sources of the state and central transfers. Kerala has been receiving lower central transfers compared with the average level of transfers received by major states.

(A) *Revenue Receipts*

The revenue receipts comprise State's own tax and non-tax revenues, share of central tax transfers and grants-in-aid from Government of India. Details of Revenue Receipts of Kerala from 2010-11 to 2020-21 are shown in Table 2.2.

Table 2.2: *Revenue Receipts from 2010-11- 2020-21 (₹Crores)*

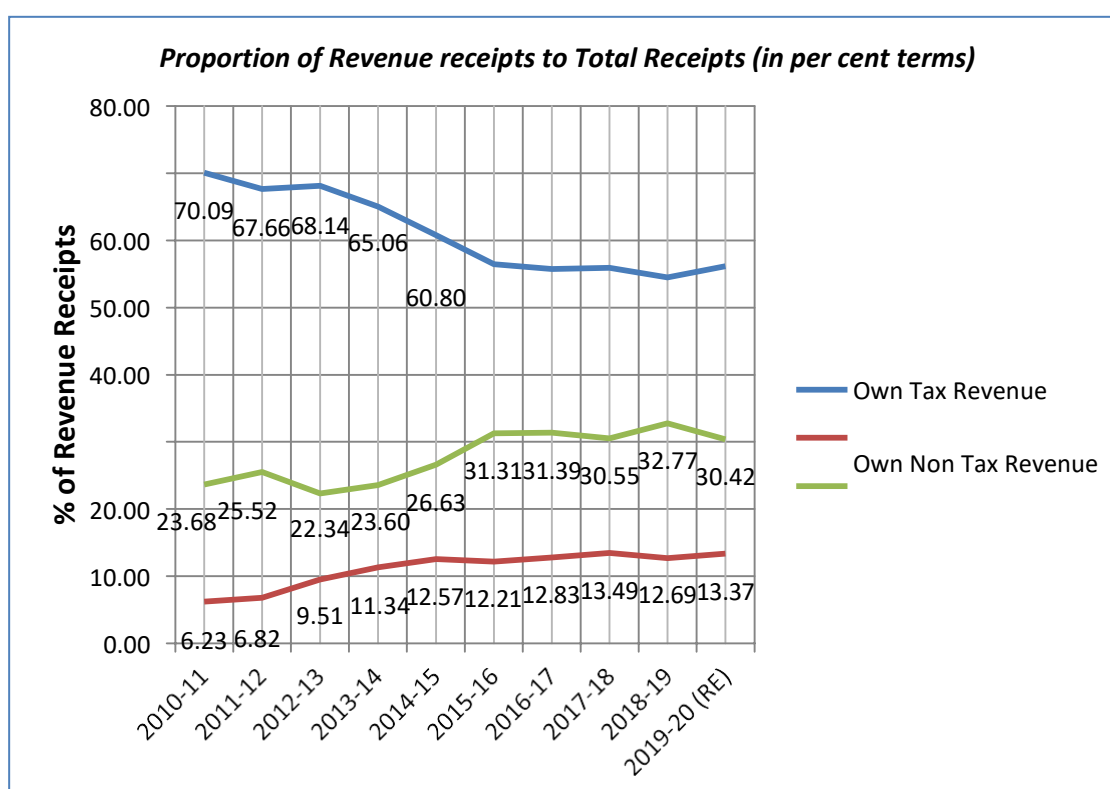
Year	Own Tax Revenue	Own Non-Tax Revenue	Central Transfers	Total Receipts	Growth Rate of Revenue Receipts (%)	Revenue Receipts-GSDP Ratio (%)
2010-11	21722	1931	7338	30991	18.70	9.55
2011-12	25719	2592	9700	38011	22.65	10.44
2012-13	30077	4198	9862	44137	16.12	10.70
2013-14	31995	5575	11606.89	49176.89	11.42	10.57
2014-15	35232.5	7283.69	15434.28	57950.47	17.84	11.31
2015-16	38995.15	8425.49	21612.02	69032.66	19.12	12.28
2016-17	42176.38	9699.98	23735.37	75611.73	9.53	11.91
2017-18	46459.61	11199.61	25360.92	83020.14	9.80	11.83
2018-19	50644.1	11783.24	30427.13	92854.47	11.85	11.88
2019-20 (RE)	55671	13244	30128	99043	6.66	11.36
2020-21 (BE)	67420.01	14587.00	32628.89	114635.90	15.74%	11.72%

Source: *Medium Term Fiscal Policy and Strategy Statement 2020-21-2022-23, GoK*

An analysis of the three major components of State revenues, viz., State Tax Revenue, State Non-Tax Revenue and Central Transfers shows that the annual State tax revenue growth declined from 18.70% in 2010-11 to 6.60% during 2019-20. On the other hand, the revenue receipts-GSDP ratio has remained more or less stagnant over the last decade. In 2015-16, the revenue-GSDP ratio marginally increased owing to the initial transfers from the 14th Finance Commission. Moreover, the revenues- GSDP ratio of the State has been displaying a downturn since 2016-17.

However, the State finances have been under severe strain continuously for the last few years according to the Medium-Term Fiscal Policy Strategy Statement 2020- 22- 2022- 23. From 2016-17, unforeseen events came to haunt the State finances. Demonetisation affected almost all household income. The Small and Medium Enterprises which are the mainstay of Kerala economy also went into disarray. The blow from GST implementation and floods of 2018-19 and 2019-20 strongly undermined the anatomy of State finances as evident from the decline of revenues- GSDP ratio since 2016-17.

Figure 2.1: Proportion of Revenue receipts to Total Receipts (in per cent terms)



Source: Finance Department, GoK

(i) **State's Own Tax Revenue**

The main sources of State's own tax revenue (SOTR) are State Goods and Services Tax, Sales Tax on petroleum and alcoholic liquor on human consumption, Stamps and Registration fees, State Excise Duties, Motor Vehicle Tax and Land Revenue. In 2010-11, it was 70.09 per cent of total revenue whereas it declined to 54.54 per cent in 2018-

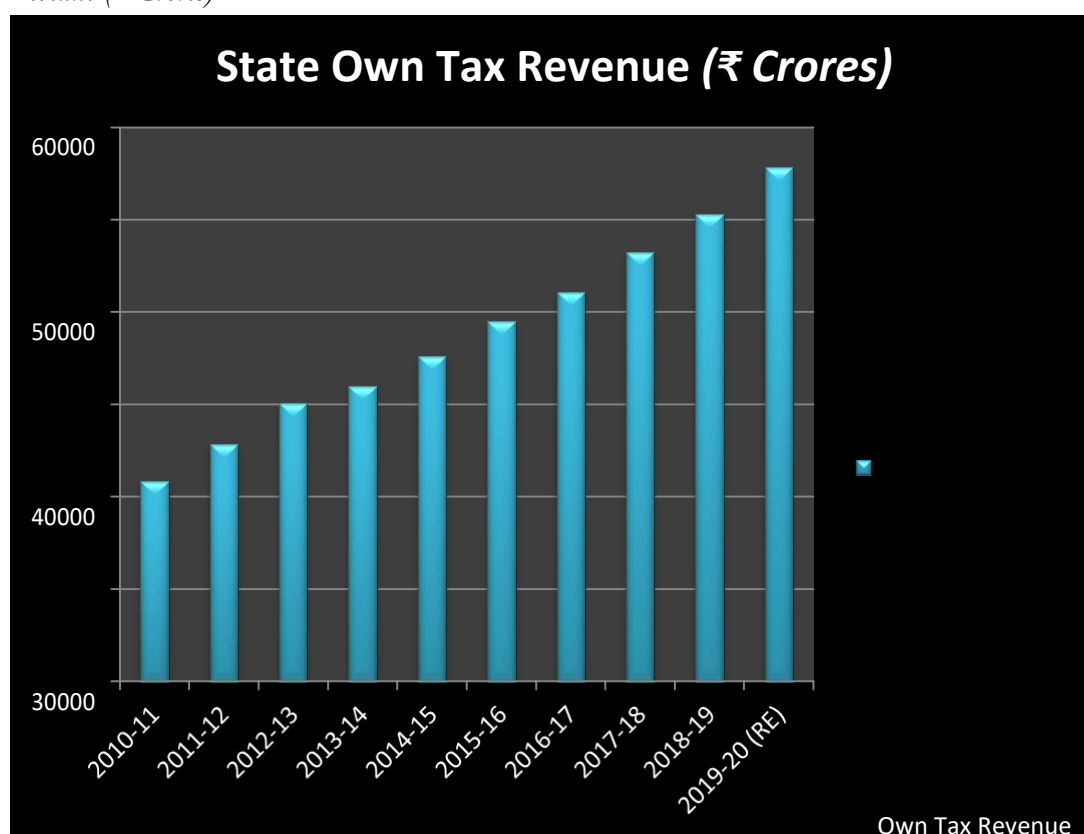
19 in the back drop of general economic slowdown and other external and internal factors which influenced the State's economy. Trend in State own tax revenue from 2010-11 to 2019-20 are given in Table 2.3.

Table 2.3: Trends in State Own Tax Revenue (₹ Crores)

Year	Own Tax Revenue	Growth Rate
2010-11	21722	23.25%
2011-12	25719	18.40%
2012-13	30077	16.94%
2013-14	31995	6.38%
2014-15	35232.5	10.12%
2015-16	38995.15	10.68%
2016-17	42176.38	8.16%
2017-18	46459.61	10.16%
2018-19	50644.1	9.01%
2019-20 (RE)	55671.18	9.93%

Source: Medium Term Fiscal Policy and Strategy Statement 2020-21-2022-23, GoK Figure 2.2: Trends in State

Own Tax Revenue (₹ Crores)



Source: Medium Term Fiscal Policy and Strategy Statement 2020-21-2022-23, GoK

(ii) **State's Own Non-Tax Revenue**

The major sources of non-tax revenue are from general services, economics services and social services, interest receipts, dividends and profits. Net receipts under State Lotteries are the major source of Non-Tax revenue of the State which constitutes around 75% of total non-tax revenue. Other main sources of State's own Non-Tax Revenue are sale proceeds of forest produces & receipts in the form of fees & fines from various social developmental services.

Table 2.4: Trends in State Non-Tax Revenue (₹Crore)

Year	Non-Tax Revenue	Growth Rate
2010-11	1931	4.25%
2011-12	2592	34.23%
2012-13	4198	61.96%
2013-14	5575	32.80%
2014-15	7283.69	30.65%
2015-16	8425.49	15.68%
2016-17	9699.98	15.13%
2017-18	11199.61	15.46%
2018-19	11783.24	5.21%
2019-20 (RE)	13244.00	12.40%

Source: Medium Term Fiscal Policy and Strategy Statement 2020-21-2022-23, GoK

The buoyancy in the growth of State's own non- tax revenue in the initial period was due to the increased collection under lotteries. However, after 2018, the sale of lotteries is stagnating. Regarding non-tax revenue mobilization, the major concerns facing Kerala are negligible contribution by way of dividends and profits from state public sector enterprises and consistently falling contribution from economic and social services.

Other sources of non-tax revenue collection couldn't be mobilised effectively owing to the constraints imposed by floods. State non-tax revenue is predicted to face a significant shortfall in collections owing to the economic crisis caused by Covid-19 pandemic and associated lockdowns in the economy

(iii) *Central Resource Transfers*

The major components of central devolution are share of taxes and grants as recommended by the Finance Commissions (FC) and grants disbursed by the Centre. The consolidation of resource transfers from Centre and its trends are shown in Table 2.5. & 2.6.

Table 2.5: Consolidation of Resource Transfers from Centre (in ₹ crores)

Year	1 Share in Central Taxes Duties	2 Plan & Grants	3 Grants fro m Finance Commission	4 Non-Plan Grants other than FC	5 Grant-in-aid and other receipts from Centre (2+3+4)	6 Total Transfers (1+5)
2010-11	5141.85	1698	434.43	64.18	2196.62	7338.47
2011-12	5990.36	2275.83	1174.34	259.04	3709.22	9699.58
2012-13	6841	2364.07	600.57	56.89	3021.53	9862.18
2013-14	7468.68	2458.8	1568.06	111.34	4138.21	11606.89
2014-15	7926.29	5523.89	1574.27	409.83	7507.99	15434.28
2015-16	12690.67	3743.98	5171.46	5.9	8921.35	21612.02
2016-17	15225	3259.98	4954.78	295.59	8510.35	23735.37
2017-18	16833.1	3409.08	3182.04	1936.72	8527.84	25360.92
2018-19	19038.2	3953.79	1646.22	5788.95	11388.96	30427.13
2019-20 (RE)	19000	3899.82	2506.56	4721.2	11127.58	30128

Source: Medium Term Fiscal Policy and Strategy Statement 2020-21-2022-23, GoK Table 2.6: Trends in the Growth of Central Transfers (₹Crores)

Year	Share in Central Taxes & Duties	Growth Rate	Grant-in- aid and other receipts from Centre	Growth Rate	Total Transfers	Growth Rate
2010-11	5141.85	16.89%	2196.62	-1.65%	7338.47	10.65%
2011-12	5990.36	16.50%	3709.22	68.86%	9699.58	32.17%
2012-13	6841	14.20%	3021.53	-18.54%	9862.18	1.68%
2013-14	7468.68	9.18%	4138.21	36.96%	11606.89	17.69%
2014-15	7926.29	6.12%	7507.99	31.42%	15434.28	32.88%
2015-16	12690.67	51.12%	8921.35	12.43%	21612.02	39.56%
2016-17	15225	20.84%	8510.35	-4.54%	23735.37	9.78%
2017-18	16833.1	10.57%	8527.84	0.21%	25360.92	7.27%
2018-19	19038.2	13.16%	11388.96	32.43%	30427.13	20.14%
2019-20 (RE)	19000	-0.21%	11127.58	-2.11%	30128	-0.43%

Source: Budget in Brief 2020-21

It can be seen that the share of central taxes and duties (flexible fund) with Grant in aid and other receipt from centre is displaying a fluctuating trend. Major reasons for the changes in central transfers are as follows:

- i. Changes in funding pattern of Centrally Sponsored Schemes (CSS) since 2015-16. In schemes where 25 per cent of cost was met by State earlier, now 40 per cent of the cost is borne by the State.
- ii. The spikes in 2010-11 and 2015-16 are attributed to the recommendations of the 13th and 14th Finance Commissions. The 13th Finance Commission increased the share by 1.5% points to 32% of the divisible tax pool. It also started direct transfer of local bodies' grants which has improved the finances of local bodies.
- iii. The 14th Finance Commission increased the devolution of taxes from 32% to 42% of the divisible tax pool. The State's share in the 14th Finance Commission increased from 2.34% to 2.5% in the horizontal devolution of the tax pool.
- iv. However, the share of cess and surcharges as a percentage of tax revenues has increased over the years for the Centre since 2016-17. Cess and surcharge do not form part of the tax devolution to States thus nullifying the positive impact created by 14th Finance Commissions increased allocation of 42% to the States.
- v. Pending dues from the Centre with respect to the GST compensation from 2017

Implications from Trends in Revenue Receipts

An analysis of composition of Kerala's tax revenue reveals that only a handful number of tax handles contribute to public revenue mobilisation in the state meaningfully. The decline in tax buoyancy of these taxes namely GST, State Excise Duties and Tax on

petroleum and alcohol owing to long term impact of consecutive floods and demonetisation has resulted in the fiscal stress of Kerala.

(B) *Capital Receipts*

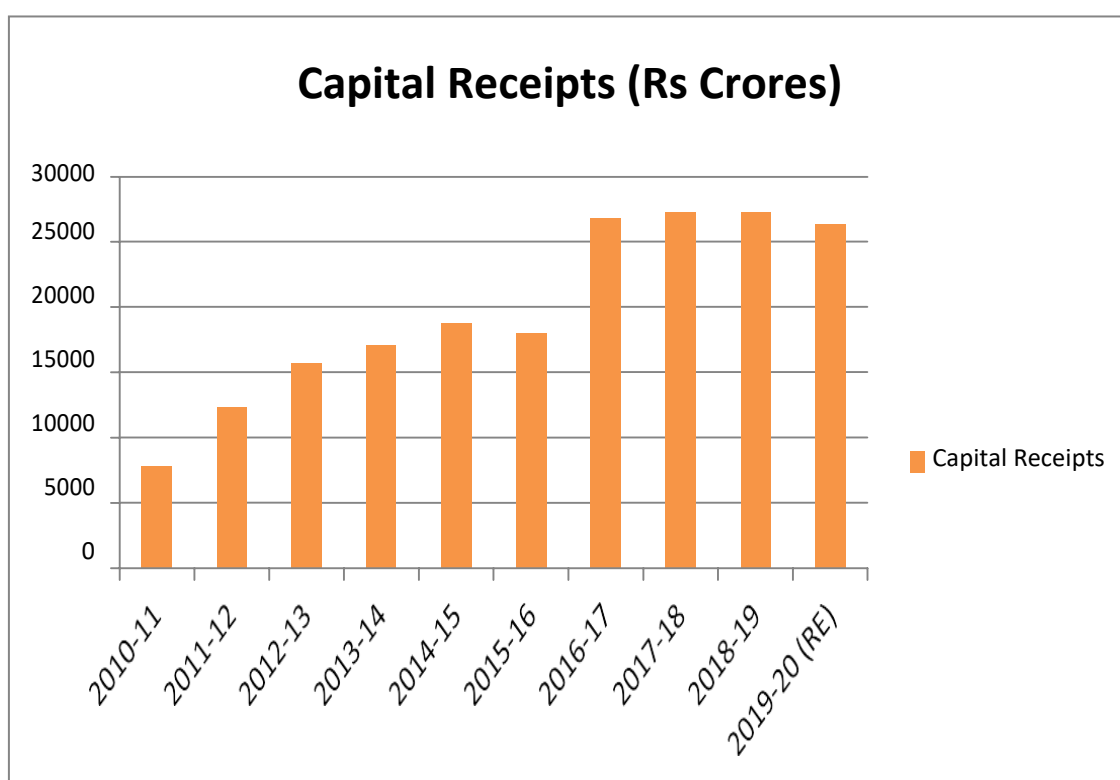
Capital Receipts of the State includes Debt Receipts and Non-debt receipts. Debt receipts consist of loans raised by the State from various sources (open market sources and financial institutions) and loans received from Government of India. Non-Debt receipts are receipts from miscellaneous capital receipts (disinvestment of shares) and recovery of Loans and Advances disbursed by the State Government. The trend in capital receipts is represented in Table 2.7.

Table 2.7: Trend in Capital Receipts (₹Crores)

Year	Capital Receipts	Growth Rate
2010-11	7807.42	-2.40%
2011-12	12284.48	57.34%
2012-13	15685.46	27.69%
2013-14	17049.86	8.70%
2014-15	18719.15	9.79%
2015-16	17965.30	-4.03%
2016-17	26762.51	48.97%
2017-18	27221.28	1.71%
2018-19	27241.61	0.07%
2019-20 (RE)	26300.36	-3.46%
2020-21 (BE)	29575.93	12.45%

Source: Budget in Brief 2020-21

Figure 2.3: Trend in Capital Receipts (₹ crores)



Source: Budget in Brief 2020-21

II. TRENDS IN GOVERNMENT EXPENDITURE

Expenditure of State includes two components viz revenue expenditure and capital expenditure which includes expenditure on loan disbursements.

(A) Revenue Expenditure

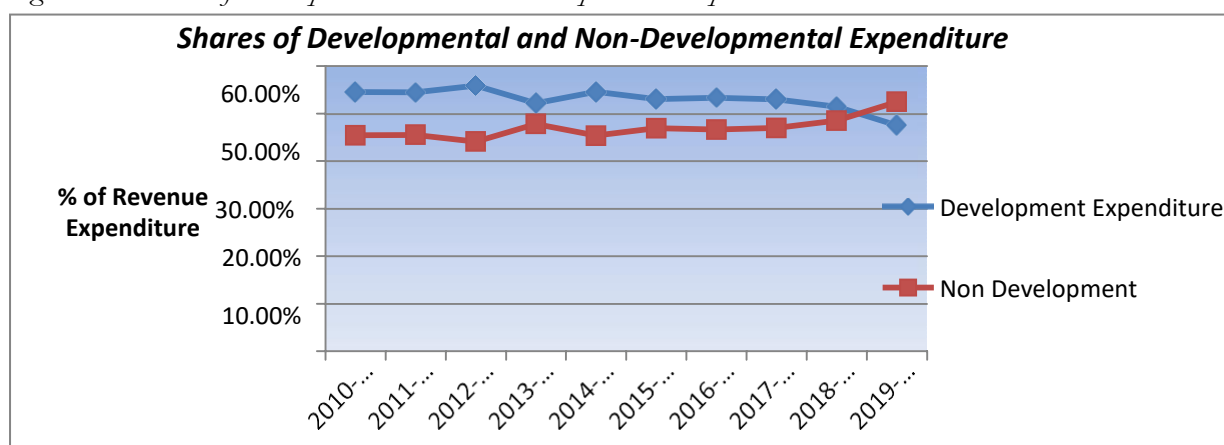
The total revenue expenditure comprises of Developmental Expenditure and Non-Developmental Expenditure. Development Expenditure: indicates expenditure under Social Services and Economic Services. Expenditure on Development fund and a portion of Maintenance fund devolved to Local Self Government Institutions are also taken as part of Development Expenditure. The expenditure on Social and Economic services is categorized as Developmental and that on General Services as Non-Developmental by the Reserve Bank of India. The following Table and Figure shows the trend of Developmental Expenditure and Non-Developmental Expenditure from 2010-11 to 2019- 20 (RE).

Table 2.8: Trend in Revenue Expenditure (₹Crores)

Year	Development Expenditure	Growth Rate (in per cent)	Non-Development Expenditure	Growth Rate (in per cent)	Total	Growth Rate (in per cent)
2010-11	18918.58	11.89%	15746.23	10.70%	34664.81	11.35%
2011-12	25069.84	32.51%	20974.78	33.21%	46044.62	32.83%
2012-13	29889.04	19.22%	23599.7	12.51%	53488.74	16.17%
2013-14	32921.1	10.14%	30197.33	27.96%	63118.43	18.00%
2014-15	39182.19	19.02%	32564.24	7.84%	71746.43	13.67%
2015-16	41762.67	6.59%	36926.8	13.40%	78689.47	9.68%
2016-17	48602.63	16.38%	42493.68	15.08%	91096.31	15.77%
2017-18	52979.53	9.01%	46968.82	10.53%	99948.35	9.72%
2018-19	56787.99	7.19%	53528.4	13.97%	110316.4	10.37%
2019-20(RE)	55389.14	-2.46%	61127.71	14.20%	116516.9	5.62%

Source: Budget in Brief 2020-21

Figure 2.4: Shares of Developmental and Non-Developmental Expenditure



Source: Budget in Brief 2020-21

Implications from Trends in Revenue Expenditure

The growth rate of revenue expenditure which touched 32.83% in 2011-12 has been substantially brought down to 5.62% in 2019-20(RE). It is observed that non-developmental expenditure represented mainly by committed expenditures namely pensions, interest payments, subsidies and salaries have a higher proportion in revenue expenditure when compared to the share of developmental expenditure.

The increasing trend in non-development expenditures has been on account of the larger expenditure commitment on salaries and pensions as part of pay commission recommendations. However, interests, pensions and salaries as percentage of revenue expenditure has shown a declining trend in recent years with the revised estimates for 2019-20 showing the ratio at 60.77%.

The share of non-development expenditures has risen from 45.42% of revenue expenditure in 2010-11 to 52.46% in 2019-20 (RE). This indicates a deep-rooted fiscal constraint in our State finances. Nevertheless, the growth rate of development expenditures has displayed sharp fall from 2014-15 to negative growth rate of -2.46% in 2019-20 (RE). The State is engaged in amassing loans for meeting the committed expenditures thereby squeezing the fiscal space for asset creation.

The increased devolution to LSGs has helped maintain the consistency in development expenditure over the last decade. It is to be noted that substantial part of the grants-in-aid to Local Self Governments is utilized for Development Expenditure. Thus, the budgetary classification, in fact, underestimates the share of Development Expenditure to the extent that it is spent from such grants-in-aid.

(B) *Capital Expenditure*

Capital expenditure comprises of capital outlay and loans and advances. Capital outlay is the direct capital expenditure on general, social and economic services by the State. Economic Services like Agriculture, Irrigation, and Industries are the dominant components of capital expenditure in the State. The trend in capital expenditure as a percentage of GSDP is shown in Table 2.9.

Table 2.9: Trends in Capital Expenditures (₹Crores)

Year	Capital Expenditure (₹Crores)	Growth Rate (in %)	GSDP (current prices)	% of GSDP	Total Expenditure	Capital Expenditure as proportion to total expenditure
2010-11	6100.46	-23.74%	324513	1.88%	40765.27	14.96%
2011-12	7744.52	26.95%	364048	2.13%	53789.14	14.40%
2012-13	8543.52	10.32%	412313	2.07%	62032.26	13.77%
2013-14	9003.32	5.38%	465041	1.94%	72121.75	12.48%
2014-15	10840.45	20.41%	512564	2.11%	82586.88	13.13%
2015-16	14403.03	32.86%	561994	2.56%	93092.5	15.47%
2016-17	11286.25	-21.64%	634886	1.78%	102382.56	11.02%
2017-18	10289.46	-8.83%	701577	1.47%	110237.81	9.33%
2018-19	9753.43	-5.21%	781653	1.25%	120069.83	8.12%
2019-20 (RE)	9126.08	-6.43%	871534	1.05%	125642.98	7.26%

Source: Medium Term Fiscal Policy and Strategy Statement, GoK Table 2.10: Trends in the capital outlay

Year	Capital Outlay (₹Crores)	Percentage of capital expenditure	GSDP (current prices)	Capital Outlay as per cent of GSDP	Total Expenditure	Capital outlay as proportion to total expenditure
2010-11	3363.69	55.14%	324513	1.04%	40765.27	8.25%
2011-12	3852.92	49.75%	364048	1.06%	53789.14	7.16%
2012-13	4603.29	53.88%	412313	1.12%	62032.26	7.42%
2013-14	4294.33	47.70%	465041	0.92%	72121.75	5.95%
2014-15	4254.59	39.25%	512564	0.83%	82586.88	5.15%
2015-16	7500.04	52.07%	561994	1.33%	93092.5	8.06%
2016-17	10126	89.72%	634886.4	1.59%	102382.56	9.89%
2017-18	8748.87	85.03%	701577.4	1.25%	110237.81	7.94%
2018-19	7430.54	76.18%	781653.3	0.95%	120069.83	6.19%
2019-20 (RE)	8013.39	87.81%	871534	0.92%	125642.98	6.38%

Source: Budget in Brief 2020-21

Sound public expenditure management requires the governments to devote a major part of their spending to capital asset creation, called capital expenditure and lesser part to unproductive current expenditures such as subsidies and salaries. Contrary to this general principle, a substantial portion of public expenditure in Kerala consists of current expenditure.

The capital expenditure as percentage of GSDP was a meagre 1.88% in 2010-11 and fell to an abysmal 1.05% in 2019-20(RE). It indicates a huge fiscal challenge for Kerala. The fact that only a very small portion of state's overall budgetary expenditure allotted for capital formation (capital outlay) do not augur well for the state economy as it is this expenditure that really affects the growth process in an economy.

The share of capital expenditure and capital outlay in Kerala's total expenditure has witnessed a fluctuating trend during the last decade. As percentage of GSDP as well, capital outlay has decreased notably from 1.04% in 2010-11 to 0.92% in 2019-20. With growing revenue deficit and fiscal deficit in recent years due to the high expenditure burden and revenue losses, the fiscal space for Capital Expenditure has been reduced as observed from the negative growth rates for capital expenditure since 2016-17. The decline in the growth rate of Capital Expenditure in the forward estimate period is also due to the high base effect of the capital expenditure in the year 2014-15.

It needs to be understood that most of the capital expenditure over the last few years have been financed through extra-budgetary operations routed via KIIFB model. The budgetary estimates of capital expenditure might not be an accurate estimate pertaining to the actual fiscal allocations for asset creation within the Kerala economy.

III. DEFICIT INDICATORS

All the major deficit indicators including revenue deficit and fiscal deficit have shown slight changes over the last decade. However, the present fiscal stress may persist due to the prevalent economic slowdown at national and global level. Major deficit indicators from 2010-11 to 2019-20 (RE) is shown in Table 2.10 and in Figure 2.7.

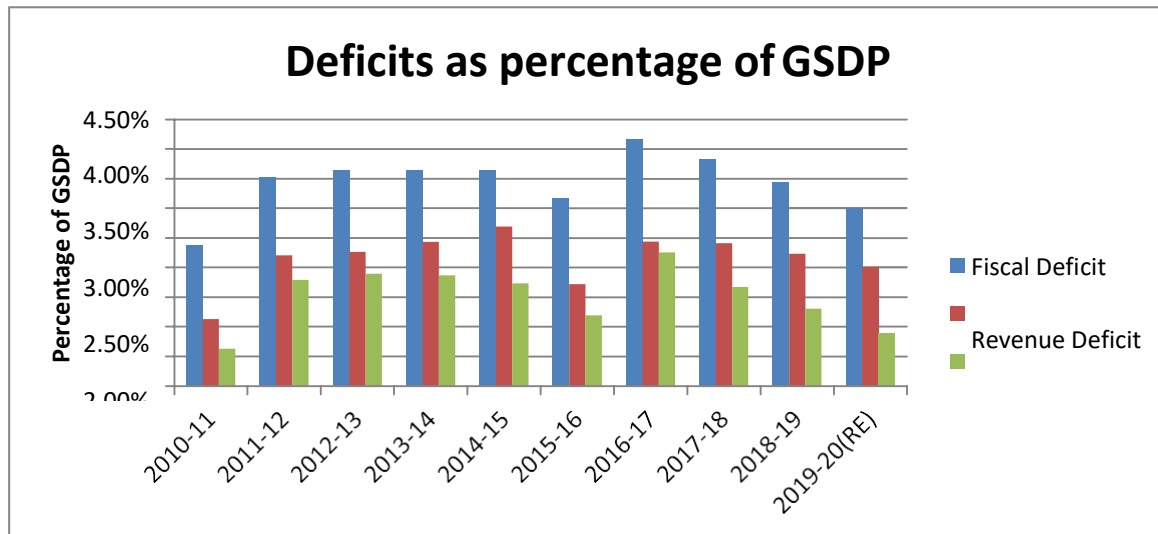
Table 2.11: Trends in major deficit indicators (₹Crores)

Year	Revenue Deficit		Fiscal Deficit		Primary Deficit		GSDP (at current prices)
	Amount	% to GSDP	Amount	% to GSDP	Amount	% to GSDP	
2010-11	3673.86	1.13	7730.45	2.38	2040.7	0.63	324513
2011-12	8034.26	2.21	12814.8	3.52	6521.18	1.79	364048
2012-13	9351.04	2.27	15002.1	3.64	7797.65	1.89	412313
2013-14	11308.6	2.43	16944.1	3.64	8678.74	1.87	465041
2014-15	13795.5	2.69	18641.7	3.64	8872.14	1.73	512564
2015-16	9656.81	1.72	17818.4	3.17	6707.77	1.19	561994
2016-17	15484.6	2.44	26448.4	4.17	14331.9	2.26	634886
2017-18	16928.2	2.41	26837.4	3.83	11717.5	1.67	701577
2018-19	17461.9	2.23	26958.3	3.45	10210.4	1.31	781653
2019-20 (RE)	17474.3	2.01	26186.2	3.00	7751.67	0.89	871534

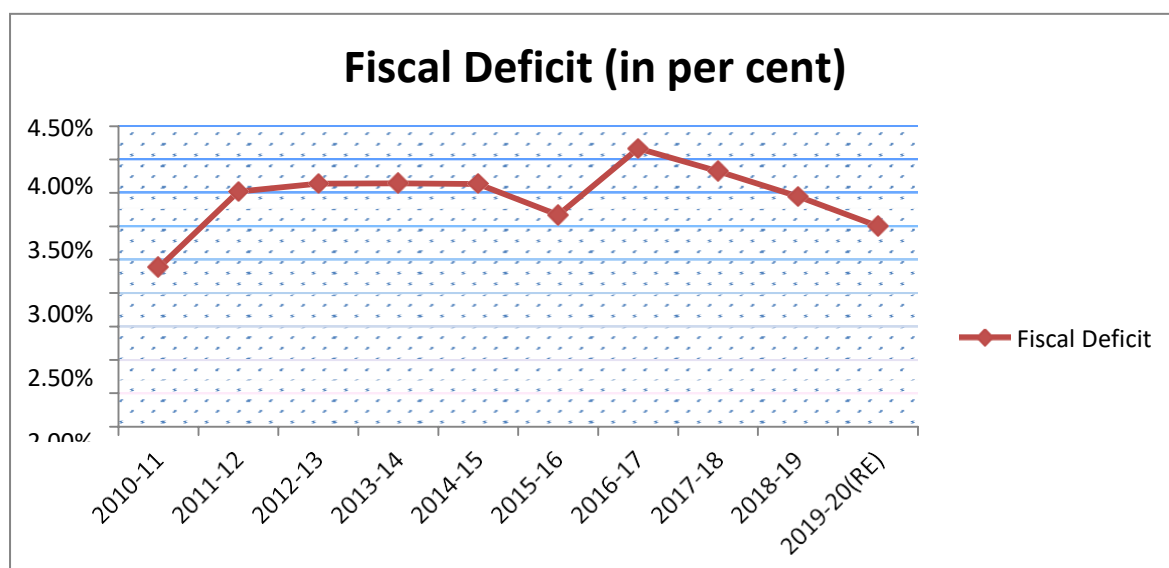
2020-21 (BE)	15201.5	1.55	29295.4	3.00	9445.39	0.97	978064
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Source: Medium Term Fiscal Policy and Strategy Statement, Budget 2020-21,GoK

Figure 2.5: Trends in major deficit indicators (per cent of GSDP)



Source: Medium Term Fiscal Policy and Strategy Statement, Budget 2020-21, GoK Figure 2.6. Trends in Fiscal Deficit as percent of GSDP (current prices)



Source: Budget in Brief 2020-21

The fiscal deficit as per cent of GSDP increased from 2.38% in 2010-11 to 4.17% in 2016-17. However, the prudent fiscal consolidation policies even in the midst of

consecutive floods and policy shocks such as demonetisation and GST has resulted in the fiscal deficit to be brought down to 3% of GSDP in 2019-20 (RE). While Kerala has managed to bring down their revenue deficit from a whopping high of 2.69% in the year 2014-15, Kerala's revenue deficit remained above 2 per cent in 2019-20 (RE).

It is noteworthy that the primary deficit which is a true indicator of current borrowings has shown a declining trend since 2016-17 and is estimated to be below 1% according to the revised estimates for 2019-20. However, the share of capital outlay in proportion to fiscal deficit reveals a staggering decline in terms of borrowings being channelized for productive capital expenditures.

From Table 2.10 and Table 2.11, it is observed that in 2010-11, capital outlay- fiscal deficit ratio was 43.51% which significantly declined to 30.60% in 2019- 20(RE). This indicates an increasing tendency to borrow for meeting the committed expenditures by the State in the short run.

IV. DEBT PROFILE

During the last five years market borrowings and accretions in Small Savings and Provident Fund Deposits are the main sources of the State Government to finance the fiscal deficit. Despite an increasing tendency in Total debt-GSDP ratio during 2010-11 to 2015-16, Kerala has successfully contained the growth in debt level through prudent debt management policies.

Outstanding debt liabilities of the State in 2018-19 were ₹235631 crores which is 30.15% in terms of Debt-GSDP ratio in 2018-19. Latest Budget Estimates predict the outstanding debt to increase to ₹ 292086 crores on account of the rising need for funds in rebuilding Kerala economy after the floods of 2018-19.

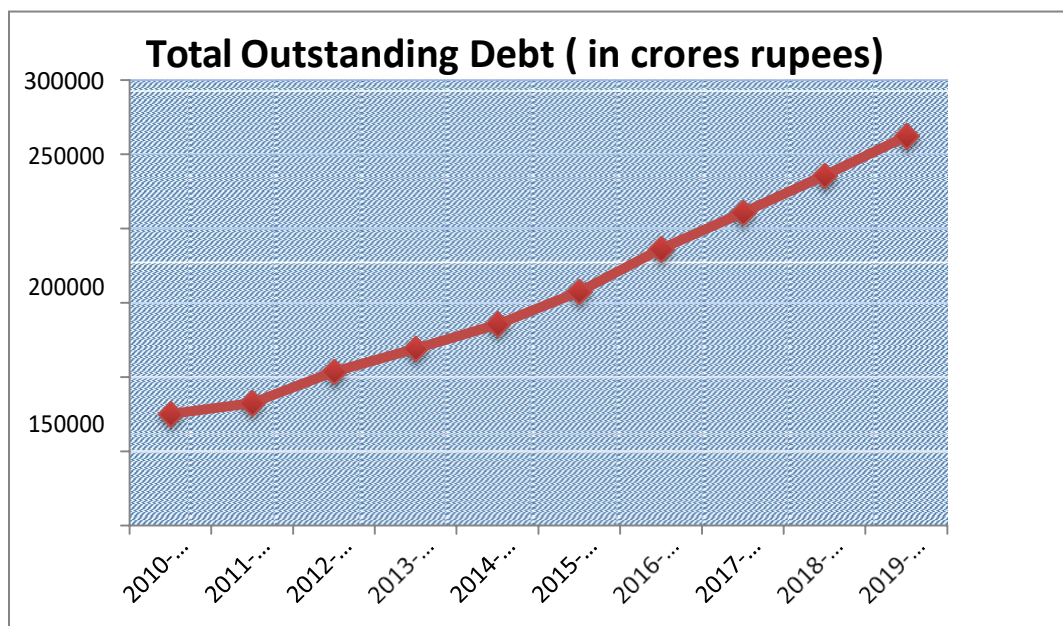
Table 2.12: Total Outstanding Debt (₹Crores)

Year	Total Debt	Growth Rate (%)	Total Debt as % of GSDP
2010-11	75055	13.20	23.13
2011-12	82486	9.90	22.66
2012-13	103561	25.55	25.12
2013-14	119009	14.92	25.59
2014-15	135440	13.81	26.42
2015-16	157370	16.19	28.00

2016-17	186454	18.48	29.37
2017-18	210762	13	30.04
2018-19	235631	11.80	30.15
2019-20(RE)	262309	11.32	30.10
2020-21 (BE)	292086	11.35	29.86

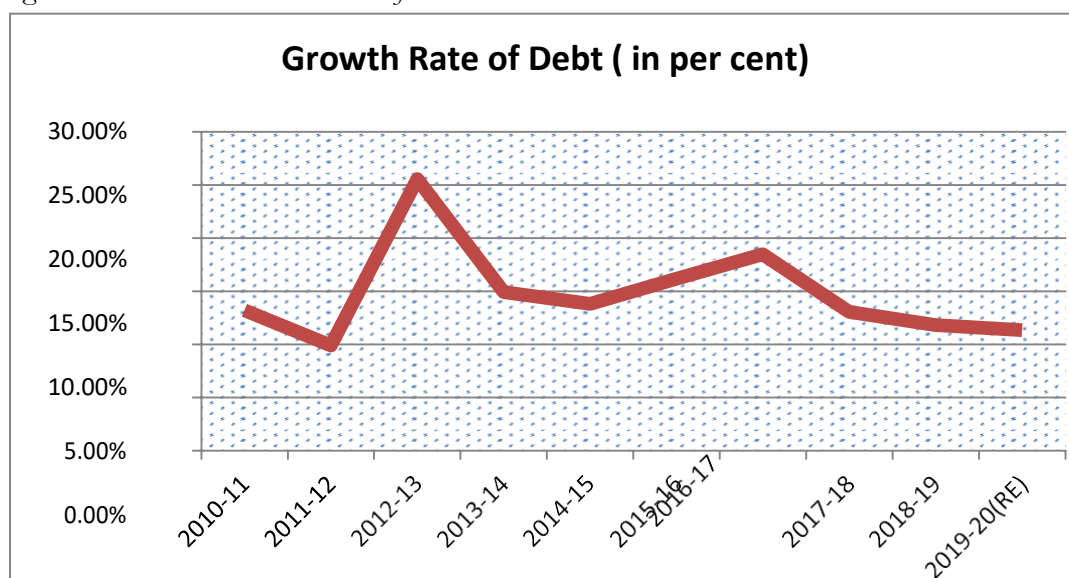
Source: Dept of Economics and Statistics, Kerala.

Figure 2.7: Trends in Total Outstanding Debt (₹Crores)



Source: Dept of Economics and Statistics, Kerala.

Figure 2.8: Trends in Growth Rate of Debt



Source: Budget in Brief 2020-21

The studies by IIM Kozhikode (Dr. Sthanu R Nair And Dr. Rudra Sensarma, *State Finances of Kerala Performance, Challenges and The Way Ahead* Indian Institute of Management Kozhikode, October 4, 2017) and Centre for Development Studies (R. Mohan, *Analysis of Fiscal Indicators of Kerala Prepared for the 15th Finance Commission*, Centre for Development Studies Thiruvananthapuram, November 2018) have maintained that the debt levels of Kerala are sustainable with the real GSDP growth hovering well above the real rate of interest.

However, Kerala's debt level at around 30 per cent of GSDP is far above the 14th Finance Commission's recommended level of 25 per cent. With respect to the composition of outstanding liabilities, the share of provident funds for Kerala is still close to 30 per cent which is higher when compared to majority of States in India.

V. Plan Outlay and Expenditure

Consequent to the inception of National Institution for Transforming India (NITI) Aayog at the Centre, Government of India did away with the Five-Year Plans. But, Government of Kerala has resolved to proceed with the Five-Year Plan and formulated the 13th Five-Year Plan (2017-22). The Plan Outlay & Expenditure for the last decade is shown below in table 2.12.

Table 2.13: Trends in Plan Outlay and Expenditure from 2010-11 to 2019-20

Year	State Plan Outlay (₹Crores)	Growth Rate	Expenditure	Expenditure on Outlay (%)
2010-11	10025	12.39%	10024.57	99.99
2011-12	12010	19.80%	11758.89	97.91
2012-13	14010	16.65%	14736.93	105.19
2013-14	17000	21.34%	14901.28	87.65
2014-15	20000	17.65%	15567.26	77.84
2015-16	20000	0.00%	21310.70	106.55
2016-17	24,000	20.00%	24470.73	101.96
2017-18	26,500	10.42%	29896.78	112.82
2018-19	29,150	10.00%	26047.32	89.36
2019-20	30,610	5.01%	*22814.01	*74.57
2020-21(BE)	27610	-9.8%	*6515.57	*23.59

Source: Economic Review 2019

*Expenditure figure taken from Planspace-as on 30th August, 2020

In spite of the fiscal shocks faced by the State over the last few years, the State Plan outlay has registered a double-digit growth except for the years 2015-16 and 2019-20. This shows the importance of public expenditure in reviving the economy in the short run thereby crowding in investment expenditure over the long run.

The growth of State Plan Outlay has been instrumental in rebuilding the Kerala economy through productive investments in social infrastructure such as health,

education and physical infrastructures such as roads, water and sanitation. The Plans were reoriented to address the livelihood requirements of people and to invest in infrastructure projects. The consistent increasing devolution to Local bodies as part of 13th Five-year plan against the background of constrained fiscal space has ensured the smooth functioning of the fiscal federalism architecture within the State.

3. EFFORTS FOR FISCAL CONSOLIDATION

The State Government has taken consistent efforts for fiscal consolidation by trying to improve tax collection and rationalising expenditure.

3.1. *Improvements in tax collection*

Improvements in tax administration and up gradation of technology such as e- filing, e-auditing and e-assessment has improved the tax base Kerala imposed a cess 1% on GST for a specific period (which is permissible under Article 279A(4)(f) of the Constitution) for additional resource mobilisation. Kerala has become the first state to levy calamity cess. Kerala Flood Cess is applicable from the 1st August, 2019 onwards for a period of two years.

Revival of PSUs on a profitable path which has enhanced the revenue receipts of the State. Eg: KMML clocked a net profit of ₹163.29 crores during FY19 on a turnover of ₹829.89 crores when compared to net profit of ₹3.24 crores on a turnover of ₹653.91 crores in 2015-16.

3.2. *Rationalisation of expenditure*

The grants in aid to LSGs are now based on bills system instead of crediting the amounts which has improved the economy of expenditures. The State has securitised a portion (up to 30%) of its Motor Vehicle Tax revenues and the revenue from Petroleum cess to KIIFB for ensuring consistent revenue source for capital expenditure

Quality of expenditure set apart for key social services like education, and health is evident from the following achievements:

- i. Kerala topped the SDG India index consecutively in 2018 and 2019. In 2018, Kerala ranked first in SDGs relating to health, education, and gender equality.
- ii. In 2019, Kerala was one of the top performers in the SDG goal relating to Industry, Innovation and Infrastructure
- iii. Health-NITI Aayog has released the Performance of States in Health Outcomes Index in June 2019 and Kerala ranks at the top in terms of overall performance with an overall score of 74.01. Kerala has brought its infant mortality rate (IMR), down from 10 to the single digit of 7 (per 1,000 live births), according to the latest Sample Registration System (SRS) bulletin 2020 with reference year of 2018.
- iv. Education- Kerala topped the School Education Quality Index (SEQI) of Niti Aayog. As per

the report, the State scores 100 per cent in terms of the transition of students from primary to secondary classes and data shows that Kerala tops, by securing 95.4 per cent, in Inclusive education. In the Governance Processes Aiding Outcomes category, Kerala has the highest score of 79.0 per cent.

Improvement in deficit indicators as evident by the continuous decline in the fiscal deficit, revenue deficit and primary deficit from 2016-17 to 2019-20(RE). The annual growth rate of debt decreased to the level of 11.80 per cent in 2018-19 from 13 per cent in 2017-18 and is budgeted at around 11.32% in 2019-20.

This is mainly due to the following reasons: (i) The composition of borrowings and liabilities has shifted markedly towards Market Borrowings, which has a lower interest burden. (ii) The share of central Loans and that from Small Savings and Provident Funds have come down. The change in composition has helped in reducing the burden of interest payments and is a movement towards fiscal consolidation.

- i. As part of fiscal consolidation and expenditure rationalization, the government has done away with the practice of use of Treasury Savings Bank (TSB) accounts by departments to draw funds and spend them later or in other words prevent them from lapsing at the end of the financial year. This would lead to expenditure rationalization and maintaining deficit targets.
- ii. Moreover, owing to the losses suffered as a result of consecutive floods in 2018 and 2019, State is expected to resort to more market borrowings in 2020 as represented by the marginal increase in debt projections of 2020-21

4. FISCAL CONSTRAINTS: APPRAISAL OF STATE FINANCES OF KERALA

4.1. Centre- State Relations in Fiscal Sphere

- 1) The implementation of GST as per the provisions of the 101st Constitutional Amendment Act since July 1, 2017 has limited the fiscal space to raise resources through taxes.
 - i. The current GST slabs are 0%, 5%, 12%, 18% and 28%. The standard tax rate on majority of goods which was 14.5% under VAT regime has come down to 9% (SGST component of 18% GST). This has led to fall in tax revenue as 75% of commodities in the pre-GST era were at 14.5% under VAT.
 - ii. Delay in receipt of GST compensation from the Central government. In the wake of Covid 19 pandemic, Centre has described the revenue shortfall as an “act of god” and is shying away from its responsibility of augmenting State finances. Despite being burdened with huge arrears of GST compensation, Kerala is now pressurized to borrow from RBI or open market by Centre to bridge their GST revenue shortfall.
 - iii. Late implementation of e-way bill has impacted the GST revenue collection of all States.

iv. Equal apportionment of GST rates between the Union and States has led to a substantial erosion of tax base of States

2) Funding Pattern of Centrally Sponsored Schemes: About 30 per cent of the total revenue of the State Government comes from loans or grants from the Central Government. This has been affected due to changes in funding pattern of Centrally Sponsored Schemes (CSS) since 2015-16. In schemes where 25 per cent of cost was met by State earlier, now 40 per cent of the cost is borne by the State.

3) Resource mobilisation is further aggravated as the State is bound by the Fiscal Responsibility Act (FRA) under which it cannot borrow more than 3 per cent of its GSDP. Recently, in the wake of COVID 19 crisis, Centre has raised the net borrowing limit for state governments from 3% of the gross state domestic product (GSDP) to 5% to make available an additional 18,000 crores for borrowings.

i. While 0.5% of the extra borrowing window will be available to all states unconditionally, 1% will be made available in four equal tranches with each to clearly “specified, measurable and feasible reform actions”.

ii. The balance 0.5% can be accessed if milestones are completely achieved in at least three out of four reform areas. While a specific scheme will be notified by the expenditure department, the reform linkage will be in four areas – universalization of „One Nation One Ration card“, ease of doing business, power distribution and augmentation of urban local body revenues.

4.2. *Impact of COVID 19 Pandemic and Lockdowns*

The Quick Assessment Report by State Planning Board on the Impact of Covid-19 and Lockdown on Kerala Economy has predicted a 23% shortfall in GSVA in the first quarter of 2020-21. It is quite probable that the Kerala economy may witness negative growth rate in 2020-21 which will lead to significant loss of revenues to the government.

The Gulati Institute of Finance and Taxation (GIFT) report “Economic and Fiscal Shock of Covid 19 on Kerala” has predicted that the shortfall in revenue receipts of the State in 2020-21 is likely to be around Rs 33,456 crores. Such a steep fall in the revenue receipts will adversely affect the plan and non-plan expenditures of the Kerala Government as well as eliminate any fiscal space for a COVID-19 Stimulus Package.

4.3. *Issues in Generation of States’ Own Revenue*

In a state which has been witnessing faster economic growth and retains top position in per capita consumer expenditure, the decline in the growth of major own tax revenue

sources namely sales tax/VAT, state excise duties and motor vehicle tax, stamps and registration fees and motor vehicle tax over the years has to be considered as a fiscal challenge for policymakers.

Moreover, the buoyancy of own tax revenue was lower than the desired level in Kerala during the phase of economic stagnation as well as the phase of accelerated economic growth over the last decade (*Dr. Sthanu R Nair And Dr. Rudra Sensarma, State Finances of Kerala Performance, Challenges And The Way Ahead Indian Institute of Management Kozhikode, October 4, 2017*) Regarding non-tax revenue mobilization, the major concerns facing Kerala are negligible contribution by way of dividends and profits from state public sector enterprises and consistently falling contribution from economic and social services.

4.4. Demonetisation of ₹500 and ₹1000 notes

Demonetisation of ₹500 and ₹1000 notes by Government of India in 2016-17 exacerbated the macro-economic problems of the State. Slowdown in the overall GDP growth rate in the Indian economy as a result of demonetisation has affected the growth of Union taxes which hurt the vertical devolution of taxes.

Kerala revenue collection mainly depends on the consumption expenditure of the people. Demonetisation affected the purchasing power and economic activities in the State, particularly in the traditional sectors such as cashew, coir, handloom, fisheries and other cash crops. Cash-intensive sectors such as retail trade, hotels, and restaurants and transportation account for over 40 per cent of the Kerala economy, and the primary sector accounts for another 16 per cent of the economy. Thus, 56 per cent of the economic activity of Kerala is immediately affected by the withdrawal of specified bank notes.

Cooperative banks and societies were kept out of the note exchange process, which was particularly damaging for Kerala. Lakhs of members who held deposits in these institutions were being denied access to any of their money. These actions resulted in the closure of banking activities at the level of the Primary Agricultural Credit Societies (PACS). Cash shortage affected domestic tourism and restrictions imposed on withdrawal of Indian currency adversely impacted the inflow of remittances into Kerala economy.

4.5. Natural calamities like Ockhi cyclone & floods of 2018 & 2019

Natural calamities like Ockhi cyclone and the floods of 2018 and extreme rainfall events of 2019 resulted in losses to productive sectors of the economy, including agriculture, industries, and tourism. This affected the revenue potential and resource mobilisation of the State. Moreover, it resulted in additional expenditure to meet the needs of rebuilding the State and reviving the productive sectors of the economy.

Table 4.1: Estimation of damage consequent to floods, 2018, in ₹ crores

Sector	Damage	Losses + Damage	Losses Total	Total Recovery Needs
Social	5,743	1,448	7,191	6,337
Productive	2,975	4,180	7,154	4,498
Cross cutting	10,561	16,159	26,718	30,715

Source: Post Disaster Needs Assessment Report, 2018

4.6. *Quality of Fiscal Deficit*

Though Kerala's gross fiscal deficit is not too high compared with other states in India, the quality of the fiscal deficit is a matter of concern. The Golden Rule of Borrowing states that over the economic cycle, the Government will borrow only to invest and not to fund current spending.

The revenue deficit to fiscal deficit ratio was 67.73% according to the revised estimates of financial year 2019-20. This indicates that a large portion of our fiscal deficit is channelized to fund committed revenue expenditures in the economy. The silver lining amidst the fiscal deficit conundrum is the consistent increase in capital outlay as per cent of capital expenditure from 55.14% in 2010-11 to 87.81% in 2019- 20 (RE).

4.7. *Concerns over the award of Fifteenth Finance Commission*

Finance Commission under Article 280 is a significant constitutional body which help in rectifying the fiscal imbalances within the Indian quasi federal structure. However,

the terms of reference for the Fifteenth Finance Commission and the interim report submitted by 15th Finance Commission has presented a grim picture for the State Finances of Kerala. Table 4.2 below show the criteria used by the Commission to determine each state's share in central taxes, and the weight assigned to each criterion.

Table 4.2. Criteria for Devolution -14th FC and 15th FC

Criteria	13th FC 2010-15	14th FC 2015-20	15th FC 2020-21
Population (1971)	25	17.5	-
Population (2011)	-	10.0	15.0
Income Distance	47.5	50.0	45.0
Area	10	15.0	15.0
Forest Cover	-	7.5	-
Forest and Ecology	-	-	10.0
Demographic Performance		-	12.5
Tax Effort	-	-	2.5
Fiscal Discipline	17.5	-	-
Total	100	100	100

Source:Interm Report for the year 2020-21, 15th Finance Commission

Implications from the Criteria for Vertical and Horizontal Devolution

The share of states in the center's taxes as per the vertical devolution recommended by 13th Finance Commission was 32 percent for the five-year period of 2010-15. The 14th Finance Commission raised tax devolution from 32 percent to 42 percent of divisible pool for the period 2015-20. Now, the 15th Finance Commission recommended to 41 percent for 2020-21 instead of 42 percent during 2015-20 period. Population is one of the key criteria that have been used to determine how the funds are horizontally distributed amongst States. However, unlike the previous Commissions, the 15th FC has decided to use the 2011 Census as against the 1971 Census that has been used by the previous nine Commissions for their calculations.

Based on 1971 Census, Kerala has 3.93% of country's population. Under 2011 census, state has 2.80% of population. Using the latest Census would penalise States such as Kerala for effective population control measures. In order, to offset the concerns of states with demographic achievements, the 15th FC has added a new determinant – demographic performance, assigning it a weight of 12.5%. While calculating demographic performance, the formula takes the inverse of the fertility rate and multiplies this with the 1971 population thereby favouring the States" with large population. Tax effort is introduced for the first time. Though it is a commendable variable, Kerala has no advantage as many of our sectors are in informal sector.

Impact on Kerala's Net Share in Proceeds

As per the Interim Report on 15th FC, Kerala is predicted to experience its share of allocations reduced by 0.557 percentage points. From 2.5% in the 14th Finance Commission, Kerala's share in the divisible pool has dipped to 1.943%. This is expected to cost the state a loss of Rs 5878.5 crores. Kerala is amongst the major States which suffers on account of the unscientific criteria for horizontal devolution.

Table 4.3. Criteria for Horizontal Devolution of 14th FC and 15th FC

Year	Share in % (Horizontal Devolution)	Corporate Tax	Income tax	Wealth Tax	Central GST	Customs	Union Excise	Service Tax	Total
2019- 20	2.5	6838.16	5745.36	-0.18	6390.49	1326.78	814.53	-	21115. 14
2020- 21	1.94	4686.75	4357.83	-0.15	4611.73	951	621.35	8.13	15236. 64

Source: Department of Finance, Government of Kerala

From the above statistics, it is clear that the criteria for devolution of funds by 15th Finance Commission are against the spirit of Indian constitution on fiscal autonomy of the State and Central-State financial relations. This pattern of devolution of taxes unhealthy change aiming at centralisation of fiscal powers in the hands of union government and rejecting fiscal autonomy and independence of States guaranteed by the constitution.

4.8. *KIIFB- Theory of Second Best in Mobilization of Resources*

The Kerala Infrastructure Investment Finance Board (KIIFB) is a statutory body constituted under the Kerala Infrastructure Investment Fund Act, 1999. In the new scenario, wherein fiscal powers of the States have been severely curtailed with the FRBM Act, KIIFB is a financial innovation to bypass the Central Act to raise funds for the need of state. Comprehensive modification of the Act and Scheme has been made through an amendment Ordinance in August 2016.

KIIFB has been restructured to act as the key Special Purpose Vehicle (SPV) for mobilizing and channeling the funds to the various infrastructure projects. With new strategy and structure, KIIFB aims to dynamically mobilize funds for the infrastructure development of Kerala. The issuance of masala bonds in London Stock Exchange market made it the first state government-run arm to raise capital through a bond sale done outside India but denominated in Indian rupees. Though KIIFB has sanctioned many hallmark projects such as KFON, Transgrid 2.0, Coastal and Hill Highways, the KIIFB model raises few fiscal concerns for the State in the long run.

KIIFB draws on some major sources of government revenue such as Motor Vehicle Tax (MVT) and Petroleum Cess. Obviously, it constrains the fiscal space left for the state budget, especially the annual plans. It calls for greater integration of the KIIFB projects and the development plans of the government departments. It also calls for better integration of manpower at the level of planning and implementation. Duplication of effort and wastage of resources should be minimized by way of better integration. There should also be better integration of political and administrative leadership of the line departments and the decision makers in KIIFB. Needless to say, all agencies dealing with public money shall be subjected to legislative scrutiny.

5. *POLICY CHOICES FOR OVERCOMING FISCAL CONSTRAINTS AND GENERATING GROWTH*

5.1. *Strengthening the Essence of Fiscal Federalism*

- In accordance with the true spirit of constitutional fiscal federalism. The share of the States in the central divisible pool shall be increased from 42 to 50 percent.
- Democratization of the GST Council by giving States more voting powers in decision making and removing the effective veto enjoyed by the Centre in the GST Council
- Union Finance Commission may estimate the actual loss incurred by the State due to the implementation of GST and recommend appropriate compensation
- The criteria for horizontal devolution of taxes should treat population as a scientific indicator taking into account the demographic variations within each State. Kerala has requested the total weightage given to the population may be raised to 30 percent consisting four components: total population of the State in 2011 (10 percent), urban population (10 percent), coastal population (5 percent) and old-age population (60+ years) (5 percent).
- In the event of Covid-19 pandemic and the associated lockdowns, States are facing huge revenue losses and unconditional public expenditure. The practice of giving revenue deficit grant shall be continued to sustain the State finances.
- The practice of shifting the financial burden of CSS to the States should be stopped. By imposing financial burden of CSS on States, the union government distorts the fiscal autonomy of the States.
- The Local Governments should be given freedom to fix priority in spending the devolved funds. The funds may be used for improving the delivery of public services, infrastructure development, plans for local level development, strengthening administrative machinery etc.
- Deficit targets and borrowing limit should be based on the past trends and assessing the growth in fiscal requirement of the State.
- Adequate freedom should be given to State government to mobilize funds including borrowing from outside the budget for development purposes while ensuring legislative accountability for the same.

5.2. Revenue Maximisation

- To finance meaningful programmes which contribute to capital formation in the state, the government should free up resources through a combination of cut in expenditure of low-priority programmes and expanding the revenue base
- Reduction in tax evasion through a broad base, low rates, limited exemptions, easy compliance and effective use of big data and technology. For instance, Big data on commercial transactions can be analysed to identify potential tax evasion similar to the lines of Project Insight by Union Government.
- Tapping of hitherto unexplored tax sources namely urban immovable property tax, entertainment tax and taxes and duties on electricity. It is necessary to create a database for new tax and non-tax sources with good revenue potential so that they can be adequately tapped
- Strengthen own tax revenue mobilization in Kerala by improving the growth of major own tax revenue sources GST, entertainment tax, property tax and motor vehicle tax, stamps and registration fees. For instance, e-stamping facility followed in many states such as Tamil Nadu and Karnataka can be introduced to prevent malpractices in land registrations.
- Considering that revenue from the sale of state lotteries constitute a significant portion of

Kerala's own non-tax revenue, serious research should go into enhancing the revenue gains from lottery.

- Review, streamline and digitize the current tax administration with the goal of increasing efficiency, simplifying compliance and creating predictability and consistency in tax regime.
- Revitalization of PSUs would add substantial non-tax revenue in the form of Dividends and Profits along with generation of jobs.

5.3. *Expenditure Rationalization*

- Adopt performance budgeting- programmes/projects should be put to tests of actual performance as against expected standards
- Linking our projects/schemes with SDG goals and making them more outcome-oriented will help terminate ineffective schemes in favor of better ones. Outcome budgets can be included in the annual budgetary exercise to link outlays with quantifiable deliverables or outcomes.
- Efforts should be made to increase the share of capital expenditure within the budgetary allocations including in the social sector.
- Within capital expenditure, focus must be on projects whose social benefits exceed their economic costs. A well-defined scientific formula by accommodating the net present values of the cash flows must be devised for capital expenditure projects.
- Timely and periodic monitoring of social welfare programmes by employing modern technology equivalent to the system of Public Financial Management System implemented by the Union government.

5.4. *Generating Economic Growth*

- Identify core sectors of growth potential in Kerala economy- Tourism, Culture, Food Processing, IT, Pharmaceuticals and Research & Development. Create micro-level regional supply and value chains to generate multiplier effects and employment opportunities.
- Promote Climate resilient infrastructure which can sustain critical economic activities to withstand the adverse effects of extreme weather events such as cyclones, floods, landslides amongst others.
- Fiscal incentives to improve the ease of doing business in fields such as Industry and Entrepreneurship, MSMEs, Knowledge Technology Entrepreneurship. Eg: Skill Parks with tax breaks and subsidies.
- Public Private Partnership model to be adopted for implementing big ticket infrastructure projects. Eg: High Speed Rail Network to be pursued with private players as partners in development.
- State Export Policy to be formulated with specific emphasis on improving the export infrastructure and diversification of goods and services. The sectors such as agriculture, food processing and Biological and Pharmaceuticals should be accorded priority status.

- Tap the large market for Arts and Sports in Kerala. Incentivize organisation of mega sporting events and cultural events which would lead to generation of economic activity and tourist inflow which in turn will generate tax and non-tax revenues for the State.

6. *WAY FORWARD*

Kerala's efforts at improving the State Finances through the fiscal consolidation path has been jolted by a series of policy setbacks beyond the control of state government like demonetization, non-revenue neutral rate apportionment and implementation problems in GST. Besides, the twin floods experienced in 2018 and 2019 and the Ockhi cyclone not only devastated the revenue potential but inflicted heavy expenditure burden on state exchequer. The COVID-19 crisis has aggravated the resource constraints of the State. The State has to incur huge expenditure to deal with the crisis and provide support to the people affected by the pandemic.

The major challenges in achieving the targeted growth rate include the slowdown in the economy, additional expenditure on account of pay revision, increased devolution for local bodies, and higher pay outs anticipated for various projects sanctioned under Rebuild Kerala Initiative. The relaxation in borrowing limits by increasing net borrowing limit for state governments from 3% to 5% of the GSDP has offered a much-needed breathing space for extra mobilisation of funds for the State. However, the conditions attached by Centre for availing the extra borrowings have invited criticism from the States for violating the spirit of cooperative federalism. Cooperative federalism would be meaningful only when adequate fiscal support is forthcoming in terms of distress.

Fiscal consolidation should be the objective in the medium run. But the short-run agenda must be rebuilding the State economy by creating a disaster-resilient infrastructure which can withstand any future disasters. In the meantime, there should be a relaxation in adhering to FRBM limits in order to revitalise the economy & enhance capital expenditures for long-term development. Government spending needs to be increased to augment consumption expenditure & a quantum leap in the field of infrastructural development could create multiplier effects in the economy. In the meantime, infrastructural push in the State through KIIFB should ideally balance investor confidence and legislative accountability particularly in a well-functioning democracy. In this era of economic uncertainties and rising responsibilities, Kerala should become the brightest spot in Indian economy by adequately discharging the role of the State as a provider of social services and creator of aggregate demand in economy.

CHAPTER 6.4

RURAL-URBAN CONTINUUM: EMERGING SPATIAL CONCERNS (*may include solid and liquid waste management*)

A peculiar feature of development trends in Kerala is the absence of rural urban polarisation. Urban areas in Kerala are relatively smaller but fairly well distributed within the State. The state policy always tries to reduce the disparity between rural and urban areas. These developments in Kerala – “Rural Urban Continuum” –have resulted in the new term “Rurban”.

Rural-urban continuum may be defined as a dynamic spatial equilibrium wherein the development process involves the people in both rural and urban areas and the returns of development are also distributed to the people whose settlement pattern is distributed spatially. This spacial characteristic *has got the features of both urban or rural settlements, but it would be difficult to classify as either of them*. In the State, the urban quality of life has improved a great deal in terms of connectivity by roads, availability of water and sanitation, power, health, education, telephones and other modern communication systems, and the like. Kerala’s settlement pattern, which is quite different from the cluster village pattern in the rest of the country, has resulted in equitable distribution of infrastructure facilities and has ensured a better quality of life for the people living in both rural and urban areas. This settlement pattern has resulted in minimising migration from rural areas to urban areas, within the state, contrary to what is seen in other states of India. The most striking features that differentiate Kerala from rest of the country is the spatial pattern of the settlement system characterised by dispersed but interconnected, linear but densely agglomerated stretches. There is practically no distinction between an urban area and a rural area, with co-existence of the primary secondary and tertiary sectors in both. Urbanization of dispersed settlements characterized by conversion of agricultural land, ribbon development and concentration of commercial built-up spaces at road junctions are the main characteristics of urban transition in Kerala. Understanding the process of development with special emphasis on spatial dimension is very important for policy making.

According to the World Population Report 2007, 40.76% of India’s population is expected to reside in urban areas by 2030. At current rates of growth, urban population in India would reach a staggering total of 57 crore by 2030. In 2011 as many as 52 cities in India had population of a million plus and the total urban population in India is 377 million, i.e., 31.2% of the total population lives in 7935 towns. In recent years, the urban sector in India has undergone a major change following the country’s transition towards a market-based economy. The share of urban population in Kerala is 47.7 per cent of the total population, representing a decadal increase of 21.74 per cent between 2001 and 2011. In Kerala the urban population is 1,59,34,926 persons and the rural population comes to 1,74,71,135. The district in which the proportion of urban population to total population is highest is Ernakulum (68 per cent). The share of urban population is lowest in Wayanad (3.9 per cent). The erstwhile Jawaharlal Nehru National Urban Renewal Mission (JNNURM) had predicted that the percentage of urban population in Kerala would increase to 60 per cent by the year 2030.

The urban sector of Kerala consists of six municipal corporations, 87 municipalities, 461 Census Towns and 19 Urban Agglomerations. Kerala, as per the Census 2011, is the third most urbanised state in India and also reckoned as the fastest urbanising state in the country. The highest number of towns falls in Thrissur district (135), which accounts for more than 25 per cent of total towns in the State. Around 60 percent of the towns are located in Thrissur, Kannur, Ernakulam and Kozhikode districts. Urban population has crossed one million in eight districts. Of these, Ernakulam has got the highest urban population, closely followed by Thrissur, Kozhikode and Malappuram districts. The total urban population of these four districts together constitutes more than 50 percentage of urban population in the State. Wayanad and Idukki districts do not have any census towns in 2011, except one statutory town each. Wayanad is the district with least urban population in the State. Considering the urban population growth index during 2001-2011, the index increased in all districts except Idukki. Malappuram district shows significant increase in urban population growth index followed by Kollam, Thrissur and Kasaragod. Wayanad has the least index value.

Spatial Planning in the State

Greater emphasis on spatial aspects in planning and policy making is essential to improve coherence and integration of political and sectoral decisions in the state. Piecemeal sectoral projects and stand-alone private developments have undermined long-term sustainable development objectives. This is particularly noticeable in cities, where the gaps between development plans, infrastructure plans and investment are jeopardizing the delivery of basic services and infrastructure.

The Town and Country Planning Department under Local Self Government Dept is entrusted to prepare Master Plans and Integrated District Development Plans, with special emphasis on spatial planning, to promote orderly development throughout the state. The department aims to give special focus to various aspects of human settlement planning and development like housing, environment, transportation, mobility plan, slum improvement, infrastructure proposals and project formulation, evolving planning standards, extension and detailing of proposal incorporated in the master plan. Presently, master plans for various selected towns and municipalities are under preparation. In Phase-I, 31 municipalities/towns were selected for preparation of master plans and of this, 11 master plans have been published and the remaining are under the process of preparation. In the Phase II, 31 towns/municipalities were selected, of which seven master plans have been published and the remaining are under preparation. In the Phase III, 25 towns were selected and all the master plans are under preparation. The Integrated District Development Plan for the district as a whole was first prepared for Kollam district on a pilot basis, which is a multi-sectoral, multilevel and long-term plan. The districts of Alappuzha, Thrissur, Idukki, Palakkad, Kannur, Kozhikode and Wayanad district were selected in the subsequent phase and the preparation of plans are under way.

The state perspective spatial plan which is essentially a long-term plan that considers a horizon period of 20 years. It provides goals, policies, strategies and general programmes. It is being prepared for spatial development of the state. The scope of the plan covers the social, economic

and spatial development goals, policies and priorities relating to all these urban activities that have special characteristics, for desired functioning. The basic purpose of this perspective plan is to provide a policy framework for further detailing and it will serve as a guideline for urban and local authorities in the preparation of development plans.

Major Achievements in Providing Urban Amenities

The infrastructural initiatives of the State in urban development including housing, urban amenities, sanitation and waste management infrastructure, are detailed below.

Urban Housing

There were three schemes under urban housing before the inception of LIFE Mission viz; Integrated Housing and Slums Development Programme (IHSDP), Basic Services to the Urban Poor (BSUP) and Rajiv Awas Yojana (RAY) till 2017. Under Integrated Housing and Slums Development Programme, out of 14211 sanctioned houses, construction of 9184 had been started and 7427 had been completed till 31-10-2016. Under Basic Services to the Urban Poor (BSUP), out of 22257 sanctioned houses, construction of 18347 were started and 16227 were completed till 31-10-2016. Government of India has discontinued IHSDP and BSUP projects on 31-03-2017.

Rajiv Awas Yojana (RAY), a flagship project of Ministry of Housing and Urban Poverty Alleviation, launched in June, 2010 envisaged a “Slum Free India”. Under the scheme, out of total 2159 houses sanctioned, 94 new houses were completed and 438 are in progress. In June 2015, Government of India subsumed Rajiv Awas Yojana project with Pradhan Mantri Awas Yojana - Urban (PMAY-U).

Pradhan Mantri Awas Yojana – Urban (PMAY_U) is a centrally-sponsored scheme jointly implemented by State Government and urban local governments to address the housing requirement of urban poor including slum dwellers with the mandate of providing Housing for All by 2022. There are four alternative components under PMAY-U Urban scheme for housing solution. Under the major component, beneficiary-led construction of new houses, 424 Detailed Project Reports (DPRs) of 93 Urban Local Governments including three development authorities namely, Greater Cochin Development Authority (GCDA), Goshree Islands Development Authority (GIDA) and Thiruvananthapuram Development Authority (TRIDA) were approved by the Ministry of Housing and Urban Affairs (MoHUA), GOI. Based on the DPRs, construction of **1,02,229** dwelling units was approved, of which 77,299 had been started and 48,445 had been completed as on 18.09.2020. The details of PMAY-U Housing scheme is shown in the Table 1. Under the component, Affordable Housing in Partnership with public and private sectors, two Detailed Project Reports (Perinthalmanna and Greater Cochin Development Authority) consisting of 488 beneficiaries have also been approved.

Credit Linked Subsidy (CLS) component aims at expanding the institutional credit flow to the housing needs of urban poor. CLS will be provided on home loans taken by eligible urban poor

for acquisition or construction of houses. Under CLS, 20,232 beneficiaries got assistance for housing.

Table 1 *Physical Achievements of PMAY –U Housing scheme in the state*

Year	Units approved (Nos.)	Started (Nos.)	Completed (Nos.)
2016-17	18,845	3517	15
2017-18	42,791	20,460	2475
2018-19	26,947	31,740	13,250
2019-20	3181	19,945	32,705
2020-21(18.09.2020)	10,465	1637	-
Total	102229	77,299	48,445

PMAY, being a centrally sponsored scheme, the unit assistance for house construction from GoI is Rs.1.5 lakh only. In the light of the prevailing high wage rates and cost of building materials in the state, this unit cost is too little to undertake the task. The State Government realised that this piecemeal assistance would not be sufficient to give momentum to housing scheme in the State and therefore adopted a comprehensive approach for addressing the housing issues and initiated the LIFE (Livelihood, Inclusion and Financial Empowerment) Mission as a flagship programme for providing houses to the houseless in the State. In the State, both the schemes have been converged and implemented as PMAY (U) – LIFE. The assistance under LIFE Mission for houseless having land is Rs.6.00 lakh for ST beneficiaries in remote ST hamlets and Rs.4.00 lakh for all other beneficiaries.

Considering the special features of urbanization and the geographical peculiarities of Kerala, the process of urbanisation in the State requires special attention while moulding various urban infrastructure development programmes. The following are the various infrastructure development programmes under the Urban Development sector.

Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

Atal Mission for Rejuvenation and Urban Transformation (AMRUT): This is one of the new initiatives of Ministry of Urban Development launched in June 2015. The scheme aims to address the basic challenges of urban physical and institutional infrastructure development covering the components of water supply and sewerage, septage, storm water drainage, urban transport, green spaces and parks. The project period of AMRUT was five years from 2015-16 to 2019-20. Nine towns were selected from the State for funding under AMRUT. This included six municipal Corporations and Alappuzha, Palakkad and Guruvayoor Municipalities. Under the scheme, administrative sanction was accorded for 1008 projects amounting to Rs. 2280 crore, of which, 478 works have been completed and 503 projects are under various stages of execution. Kerala received an amount of Rs.59.52 crore from the Ministry of Urban Development (MoUD)

for the reform accomplishments. Moreover, credit rating was completed in all the nine Mission cities. Under AMRUT, water supply project covers almost 70 per cent of the total project cost and 24 *7 water supply have been ensured in Mission cities. The progress is shown in Table 2.

Table 2 *Progress of AMRUT project as on 14-09-2020 (in Numbers)*

Urban Local Governments	Total projects	AS Accorded	TS Issued	Tendered	Work awarded	Work Started	Work Completed
Thiruvananthapuram	270	270	270	270	251	247	141
Kollam	60	60	60	60	52	51	28
Alappuzha	194	194	191	191	184	184	87
Kochi	98	98	98	98	95	93	57
Thrissur	113	113	112	112	111	101	61
Palakkad	152	152	152	151	150	144	71
Guruvayur	34	34	33	33	33	29	10
Kozhikode	50	50	50	50	48	48	10
Kannur	37	37	37	37	36	34	13
Grand Total	1008	1008	1003	1002	960	931	478

Smart Cities Mission: This is a major infrastructure development programme launched in 2015 to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of smart solutions. Kochi has been selected under the Mission in the first phase and subsequently Thiruvananthapuram in the third phase. The total estimated project cost of the smart city Kochi is Rs. 2076.00 crore and that of Thiruvananthapuram is Rs.1538.20 crore.

The Smart city proposal of Kochi aims at a planned and integrated development of Fort Kochi-Mattancherry area by improving the civic infrastructure. Under the scheme, 42 projects are envisaged, of this, 18 projects had been started, and 22 projects are in tendering stage, of which, two are housing projects. The projects which had been started include roof top solar project, Intelligent Traffic Management system, cancer block for General Hospital, smart roads and distribution of waste bins. The system of 'Smartcard' was launched in 2017-18.

Smart City Thiruvananthapuram Limited (SCTL) envisages 43 projects for which DPR prepared for 29 projects worth Rs. 636.82 crore and administrative sanction has been accorded for 28 projects amounting to Rs. 604.80 crore (including convergence projects). Convergence projects worth Rs.89.21 crore are already under implementation under Swadesh Darshan and AMRUT. Development of smart bus shelters, (Ayurveda College, Panavilla and Killipalam); upgradation of public toilets (Thampanoor bus terminal, Sulabh toilets in Corporation Office compound and PutharikhandamMaidanam), construction of information kiosks (Corporation Office compound and Gandhi Park) and installation of drinking water kiosks are in the final stages of implementation. Procurement of 15 electric autos and 15 electric rickshaws are underway. DPR

for mega projects like smart road, Integrated Command and Control Centre, underground pedestrian subway at East Fort, re-development of Rajajinagar, warehousing and multilevel car parking at Chalai are in the final stage of preparation.

Sanitation

As waste management is a very serious issue to reckon with high levels of urbanisation, Government of Kerala has been giving a great deal of emphasis to this. Suchitwa Mission is the nodal agency for evolving implementation strategy and providing technical support to the State Government and Local Governments in developing solid and liquid waste management projects and policies. The State is Open Defecation Free (ODF) from November 1, 2016 onwards in rural areas and is now focusing on ODF Sustainability and 'ODF Plus' activities. In urban areas, construction of Individual Household Latrines (IHHLs) target has been achieved by constructing 29,578 IHHLs. 92 urban local governments except Cochin Corporation in the State have been declared as Open Defecation Free (ODF) by the Ministry of Housing and Urban Poverty Alleviation (MoHUPA). Only one Urban LG lags behind in ODF, and that is the Municipal Corporation of Cochin, where ODF criteria has been fulfilled for the entire area except Post and Telegraph colony in Gandhi Nagar ward. The 87 families in the colony have toilets but there is no plant for treating toilet waste scientifically, and is discharged to the canal nearby. Hence the government decided to rehabilitate the said families under the LIFE Mission. But during the floods 10532 toilets were damaged. The project to repair the damaged toilets /replace totally damaged with new ones is being undertaken in the current year. District wise details of Open Defecation Free (ODF) declared in Urban Local Governments is shown in Table 3.

Table-3 *District wise details of Open Defecation Free (ODF) declared in Urban Local Governments*

Details of ODF status in Urban						
Sl. No	Name of District	No. of Municipalities	IHHL Target	Work Progressing	Completed	No. of Municipalities declared ODF
1	2	3	4	5	6	7
1	Thiruvananthapuram	5	6317	0	6317	5
2	Kollam	5	3397	0	3397	5
3	Pathanamthitta	4	1673	0	1673	4
4	Alappuzha	6	1711	0	1711	6
5	Kottayam	6	1395	0	1395	6
6	Idukki	2	445	0	445	2

7	Ernakulam	14	3426	141	3285	13
8	Thrissur	8	2546	0	2546	8
9	Palakkad	7	894	0	894	7
10	Malappuram	12	2058	0	2058	12
11	Kozhikode	8	2855	0	2855	8
12	Wayanad	3	912	0	912	3
13	Kannur	10	1198	0	1198	10
14	Kasaragod	3	770	0	770	3
	Total	93	29597	141	29456	92

Solid and Liquid Waste Management

The 13th Plan Approach Paper suggests that Haritha Keralam Mission also must recognise the importance of safe and scientific waste management, especially of urban solid waste. The 13th Plan working group report on Urban Issues focuses on introducing decentralised solutions for solid waste, including home/community level composting and promoting recycling industries. There should be at least one in every district to promote reuse and resale. The government has taken a three-pronged approach to waste management in the State. (i) Source level waste reduction and treatment of biodegradable waste at the source itself (ii) Upgradation of existing common waste management facilities of Local Government institutions using trustworthy and familiar technology such as composting and bio-methanation; and (iii) Establishment of community-level waste management systems for handling non-biodegradable waste. The most efficient method of managing waste in terms of resource recovery and environment friendliness is segregation of waste and composting of wet waste at source.

Green protocol is being promoted in major events such as festivals, meetings etc. The LGs in the State formed a workforce, namely, Haritha Karma Sena for providing assistance to the households for the composting of wet-waste at source and for the collection of all dry discards for recycling. Suchitwa Mission extends financial and technical support to LGs for establishing Resource Recovery Facility (RRF) centers and Material Collection Facility (MCF) centers. The RRF centers facilitates sorting and managing of different types of non-biodegradable waste for reuse or recycling. MCF center is the temporary storage of non-biodegradables obtained from door-to-door collection for forwarding to RRF centers. Urban Local Government wise details of Haritha Karma Sena and Resource Recovery Facility centers and Material Collection Facility centers are given in the Table 4.

Table 4. *Urban Local Government wise Details of Harithakarma sena*

Sl. No.	District	Total No. of ULGs	HKS - formed		HKS - started functioning	
			Municipalities	Corporations	Municipalities	Corporations
1	Thiruvananthapuram	5	4	1	4	1
2	Kollam	5	4	1	4	1
3	Pathanamthitta	4	4	0	4	0
4	Alappuzha	6	6	0	6	0
5	Kottayam	6	6	0	6	0
6	Idukki	2	2	0	2	0
7	Ernakulam	14	13	1	12	1
8	Thrissur	8	7	1	7	1
9	Palakkad	7	7	0	7	0
10	Malappuram	12	12	0	12	0
11	Kozhikode	8	7	1	7	1
12	Wayanad	3	2	0	2	0
13	Kannur	10	9	1	9	1
14	Kasaragod	3	3	0	3	0
	Total	93	86	6	85	6

Table 5 *Urban Local Government wise Details of Resource Recovery Facility centers and Material Collection Facility centers*

Sl. No.	District	Total No. of ULGs	MCF - construction completed		MCF - started functioning		RRF- started functioning	
			Municipalities	Corporations	Municipalities	Corporations	Municipalities	Corporations
1	Thiruvananthapuram	5	3	47	5	6	3	2
2	Kollam	5	6	1	4	1	4	1
3	Pathanamthitta	4	4	0	5	0	3	0
4	Alappuzha	6	23	0	24	0	5	0
5	Kottayam	6	6	0	10	0	2	0
6	Idukki	2	3	0	3	0	2	0
7	Ernakulam	14	20	5	21	5	3	2
8	Thrissur	8	9	9	9	7	4	1
9	Palakkad	7	6	0	7	0	6	0
10	Malappuram	12	8	0	12	0	2	0

11	Kozhikode	8	5	0	7	0	1	1
12	Wayanad	3	2	0	2	0	0	0
13	Kannur	10	8	3	9	3	5	0
14	Kasargod	3	3	0	4	0	2	0
	Total	93	106	65	98	23	42	7

In order to expedite the process of source-level treatment of waste, indigenous technologies suitable for the State have been identified and implemented, which include pipe-composting, pot- composting, bucket-composting, kitchen-bin composting, bio-bin composting, etc, in addition to vermi-composting, ring-composting and biogas plants. Source level treatment of waste helps to minimise the volume of resources and energy required for the management of waste. For promoting source level composting of bio-degradable waste, Suchitwa Mission has empanelled more than 100 service providers for ensuring supply of composting devices. The devices promoting for the source-level composting of waste are kitchen bin, bio-digester pots, bio-bins small & large, mud pots, tri-pots etc.

Under solid waste management, 82 Urban Local Governments (ULGs) have prepared the Detailed Project Reports and the Ministry of Housing and Urban Affairs (MoHUA), GoI, has approved these DPRs. For source level treatment of bio degradable waste in ULGs, composting installations including 8,37,763 composting pits and 17,260 number of biogas plants have been made functional at household, institutional and community level. Four Municipalities have undertaken projects for source-level treatment of waste with a total outlay of Rs.61.35 lakh. A plastic shredding facility is functional in Neendakara Harbour to shred, bale, and forward plastic materials collected from sea by the fishermen.

With the support of Suchitwa Mission, 15 permanent and 40 temporary swap shops - a public system for exchanging reusable goods that could be useful to others, has been established in the State. Suchitwa Mission has created a pool of 115 service providers with technical expertise and 35 Harithasahayasthanam and 1800 resource persons for extending assistance to the local governments. About 2300 scrap merchants are now registered with Suchitwa Mission.

Under the AMRUT scheme, nine septage plants and 18 sewage plants are being implemented in the state.

Green Protocol

It is a set of guidelines for changing individual and societal attitude and behaviour towards zero-waste and improved hygiene. The guidelines, in general, persuade the public to do away with disposables, promote usage of reusables and recyclables, reduce waste, segregate waste at source, treat biodegradables at the source itself, facilitate the reuse and recycling of non-biodegradables etc.. Now more and more institutions are adopting the protocol, especially for marriages, festivals, pilgrimages etc. It maximizes the use of environment-friendly materials and prevents the accumulation of disposable materials. The Government has now ordered all its departments and sub-offices to observe Green Protocol strictly. The Suchitwa Mission under the banner of Haritha Keralam Mission is now building a public campaign to popularize the observance of Green Protocol all over Kerala.

The 13th Plan aims at integrating urban development with the Master plan focussing on inclusive sustainable urban development. Through the Research and Development (R&D) scheme of Town and Country Planning department, study on the parking policy of Kozhikode Corporation was completed. Master plans were published in eleven towns and draft reports were prepared for four. Integrated District Development plans were prepared and completed in six districts and are progressing in two districts. Local development plans were initiated in ten Grama Panchayaths in three districts. GIS based master plans were prepared for the nine AMRUT towns during the first two years of 13th plan period.

Urban Poverty Eradication Programmes

Ayyankali Urban Employment Creation Scheme (AUECS)

The State Government has launched the Ayyankali Urban Employment Guarantee Scheme in the pattern of MGNREG during 2009-10. The Scheme is intended to address the unemployment and under-employment problems in urban society. The objective of the scheme is to enhance livelihood security in urban areas by providing at least 100 days of wage employment to every household whose adult members are willing to do unskilled manual labour. Creation of durable community assets and strengthening the livelihood resource base of the urban poor is also envisaged under the scheme. The scheme is designed in such a way that at least 50% of the beneficiaries shall be women who have registered and demanded for work under the scheme.

Cleaning of drainage and streets on a regular basis is included to provide more job days to the beneficiaries. Further the devastating flood has affected many urban Local Governments and thousands of urban populations lost their livelihood. Thus, priority was given to the flood affected Urban Local Governments (ULGs) for enhancing the average person days of

employment of the affected people. Convergence of PMAY- LIFE with Ayyankali Urban Employment Creation scheme has been ensured to create additional workdays. In order to provide maximum workdays and ensure smooth implementation of the scheme, essential tools and small machines required for the labour work are also provided under this scheme. Dairy farming has also been introduced under the scheme. Dairy farmers who have more than two cattle can be given employment and wage through the scheme as per the norms. The physical achievements of Ayyankali Urban Employment Scheme is shown in Table 5.

Table 5 *Physical Achievements of Ayyankali Urban Employment scheme*

Year	Persondays created	No. of households provided employment
2015 - 16	3,73,000	12,800
2016 - 17	3,84,000	13,064
2017 -18	8,46,432	28,797
2018-19	16,68,195	85,943
2019-20	26,80,660	104652

Deendayal Antyodaya Yojana–National Urban Livelihood Mission (DAY-NULM)

DAY-NULM for urban areas with a funding pattern of 60:40 ratio aims to reduce the poverty and vulnerability of the urban poor. The scheme is being implemented in all the Urban Local Governments in the State. DAY-NULM identified 3,195 homeless persons in the shelter to the urban homeless component of the scheme. Further, 22,722 street vendors were identified in the 'support to urban street vendors component' in 2018-19 and 2019-20 (up to September 30, 2019). Identity cards were issued to 11,744 street vendors during the period. Under the component, 'employment through skill training and placement', 8,709 candidates have been enrolled and out of these 3,548 candidates were certified and 3,157 candidates got placement. Skill training has been imparted to the unemployed urban poor youth in 74 trades across the sectors like cyber security, accounting, health care, automation, plastic technology, electronics, electrical, Ayurveda Nursing, hospitality, telecom, food processing etc. Under the self-employment programme of DAY-NULM, 1,322 individual micro-enterprises and 245 group enterprises were established and 10,568 of NHGs have availed NHG linkage loan. Under the 'social mobilisation and institution development' component of DAY-NULM, opportunities are given to set up micro enterprises. Through this, 5,410 number of new NHGs are formed, 3,607 numbers of NHGs and 247 Area Development Societies (ADSs) are supported with revolving fund and 8 city livelihood centres sanctioned.

As part of DAY-NULM, specific interventions were made for Micro enterprises for marketing their goods and services such as identifying nano markets, displaying products of micro

enterprises units in the web portal, setting up food kiosks and food fests etc. In all the placement-linked skill development schemes, skill development agencies are not able to coordinate the placement in line with the aspirations of the unemployed youth. Many recruiters are willing to absorb candidates only from Human resources (HR) supply agency. HR supply agencies thus formed a society called 'Human Arm' of the girls skilled under DAY-NULM. Annual turnover of the society during last year was ₹1.79 crore employing 187 candidates. The women employees are drawing an average monthly salary of ₹14,321 and they have the benefits of PF and ESI.

Way Forward

- Land use planning has to be complemented by the development of more strategic spatial planning, which is concerned not only with land use, but also with economic development, transport, service provision and ecosystem services. Spatial planning has to be focused not on policing the differences between spaces or land uses, but on the connections between places. It is strategic not only in the sense of having a long-term vision, but also shall directly engage with rural-urban interactions and with the need to plan rural and urban areas together.
- With high rate of growth of urbanisation in the state, the urban as well as rural local bodies in urban agglomerations are facing inadequacies of financial and other resources to cope with increasing demands on services to meet the minimum expectations of the residents in terms of water supply and sanitation, drains, roads, solid waste management, street-lighting, etc. In view of the increasing urbanisation it is imperative to examine whether the institutional arrangements and the fund devolution to urban and rural local governments which are in position is adequate to ensure that the cities and towns catch up with the backlog of inadequacies as well as meet the growing needs.
- It is a fact that the urban scenario in terms of availability of infrastructure and services, varies widely across the state, between cities of different size classes, and within the cities among the localities of the better-off sections as against the poorer areas. The bigger cities tend to have better institutional arrangements with a higher calibre of manpower and greater access to resources. Certain cities like Kochi, Trivandrum etc tend to stand higher and get more attention, with greater economic activity, while the very small towns with extremely limited resources rarely see any improvement.
- The larger cities often have the capacity to raise resources from the market and from domestic as well as national and international funding agencies. There is a need to look into these discrepancies and reduce them. While market borrowings are not yet a viable source of financing for urban infrastructure in most instances, a beginning has to be made for building up credit worthiness in ULBs, if not as a whole then at least for individual sectors such as water supply, and wherever else user charges and general resource position makes it feasible to use debt funds to supplement grants or own resources for infrastructural needs.
- In the State the fifth round of SFC is now in position and it is to be hoped that as the system of allocation of resources between the State Governments and the local bodies may place a heavier weight on basic needs of urban development, and may place more focus to

meet the needs of the suburban nature in rural areas to the fullest extent. The Fifteenth Central Finance Commission, in general, is focusing on the growing needs of urban areas, especially in terms of drinking water and sanitation, and had placed tied funds for the urban agglomerations as well in the fund devolution to the states which the state has to implement it to the fullest extent as the fund devolution in the coming years depends on the rating of achievements in these sectors of the current year.

- For urban local self-governance, capacity building for resource raising and provision of services is equally important. Evidences shows that functional autonomy becomes a reality only when financial strength supports it. The public service element requires professionalisation, and greater accountability to the urban residents. As resources are the biggest problem of ULBs, measures for comprehensive and rational levy of property taxes and user charges are necessary to be implemented on priority. Adoption of modern accounting systems, improved practices of budgeting and planning, implementation of best practices which have produced results in Kerala conditions, effective use of Ward Committees and other means of peoples' participation, and programme assistance under the existing schemes of Urban Affairs Department should be put to use for improving urban governance.
- The State Government must devise and set up a system of collection of urban data or indicators for urban mapping in which data are collected about the urban requirements, their inadequacies and inequities, and the status of services. This would help civic amenities, for which Town and Country Planning Department can be entrusted. Urban mapping using GIS technology with layout of services, responsibility zones, and identified problem areas, are a basic tool for urban planners and the State Finance Commissions who have to make recommendations regarding allocation of resources for the augmentation and maintenance of these services. In short, technology-based mapping systems have to be ensured for data management.
- A larger quantum of central assistance, including external assistance routed through Government of India, as well as institutional finance from HUDCO and other agencies, would be necessary during the Fourteenth Plan if we are to take up a vigorous programme of upgradation of infrastructure and services. The coverage of central assistance in the past has been uneven and inadequate, and the reasons are both procedural as well as budgetary. A substantial step up in Central allocation to the urban sector is required, if the cities are not to collapse under the weight of their unfulfilled requirements.
- Regarding urban poverty, the programmes should be based on a proper assessment of all types of needs and vulnerabilities like housing and its economic, social and personal facets. Secondly, the programmes should have sufficient flexibility and institutional arrangements so that the specific needs of poor households in a given context can be met within the programme framework. There is an urgent need for organisational arrangements for effective managerial coordination or convergence of services whereby the poor are given a forum where their needs are made known and then acted upon.
- The other area requiring a thorough review is vocational training. Much of this is in the Government sector and fails to equip the candidates with sustainable level of skills or self-employment. Innovative areas of employment as developed in the state under the Kudumbasree programme must be emulated across the urban areas of the state. The scope

of Ayyankali Urban Employment Scheme has to be adequately strengthened to provide adequate employment for skilled and unskilled, by capturing the job opportunities arising out of urban development as well. The possibility of increasing the job days to 200 days and increasing the wage rate may also be looked into.

- The slum programmes need rejuvenation, and better implementation and monitoring at the State level. Some of the obvious lapses in slum management are lack of basic information on the status of basic amenities provided or lacking, absence of master-planning to gradually increase the level of civic amenities, failure to provide coordinating institutional arrangement (especially provision of land), and facilities for street vendors and hawkers. Further, the absence of planning for housing and socio-economic needs of the urban poor; the failure to converge available civic services in sanitation, paved access and drainage; streetlights; solid and liquid waste management; water supply; etc. are problems that still exist.
- There is a need to increase the supply of affordable housing, and repair and maintenance of dilapidated houses to the economically weaker sections and the low-income category through a proper programme of allocation of land, extension of funding assistance, and provision of support services under LIFE Mission. Building designs, especially in the case of apartments, need to be gender sensitive and elderly friendly, and should accommodate the requirements of physically challenged segments of the population. The Credit Linked Subsidy Scheme of PMAY (Urban) has to be better utilised in the state. It needs more publicity and cooperation from the banking sector.
- In order to provide houses to those who cannot afford them, especially for migrant workers, there is need to encourage promotion of rental housing by private sector, public sector, as well as cooperatives and individuals. This requires legislative changes in the existing rent control laws, and has been a matter in which very little progress has been achieved.
- The size of the migrant labourers in the State is estimated as 30 lakhs now. These labourers or “guest labourers” are temporarily settled in urban areas, and face a variety of social and economic problems. These include unhygienic lodging facilities, overwork and poor labour conditions, high cost of living, vulnerability to epidemics and other contagious diseases, absence of proper registration (for security reasons as well) and protection, problems of social integration, and absence of healthcare and education facilities to their family members. All Urban Local Governments must frame suitable policies to address these issues, which are likely to aggravate in the ensuing years. As migration and regional disparities are strongly interrelated, the impact of internal migration of these labourers on urbanisation has to be studied in-depth and suitable policies framed to address the issues.
- A good network of climate sustainable roads with proper rain water drainage systems coupled with an efficient mass urban transport system play a catalytic role in urban economic growth, with beneficial impact on the urban poor. However, there is growing trend towards increasing number of personalized vehicles, especially two wheelers which account for 60- to 80 % of motor vehicles. This results in congestion on the roads, slowing-down of commuting time, and atmospheric pollution. Narrow carriageways and poor road surface add to the problems. Growing vehicular pollution in cities is a cause of great concern, as are noise levels and traffic accidents. Development of suitable institutional

mechanisms at all levels for the planning, financing, construction and O&M of urban transportation systems is required.

- Provision of rail-based urban transport system in certain corridors in all million plus cities becomes inescapable, and institutional arrangements for introducing such systems in eligible cities are overdue. City-wise specific projects for rail-based urban transport systems together with funds required for them need to be identified. Use of urban rail services is extremely limited with only Kochi having metro rail systems. Phase II of Kochi metro which is under construction has to be augmented and its expansion to other districts may be looked into.
- The state with its unique geophysical setting of highlands, midlands and lowlands and a linear settlement pattern with high urban settlement densities has unique sanitation related challenges. Therefore, there is a need for conjunctive planning and incremental implementation for various sanitation systems and services to support the state and help urban local bodies achieve the goal of universal coverage of effective, safe, hygienic and sustainable solid and liquid waste management systems. Lack of a decentralised and integrated city-wide approach for sanitation and waste management is of great concern and needs quick attention in the state.

CHAPTER 7

DECENTRALISATION AND LOCAL GOVERNMENTS IN KERALA

1. Introduction

Decentralisation of governance is one of the most important features of administration in Kerala, and affects all spheres of life. Local Self Governments in Kerala have been meaningfully empowered through massive transfer of resources as well as administrative powers. Over the years, they have emerged as effective “Local Governments” for the formulation and implementation of developmental programmes and for coordinating the works of various agencies involved in local area development. The pivotal role played by them is clearly evident be it the exemplary work done during the floods of 2018 and 2019 or the current COVID-19 pandemic.

Kerala has just been through the exercise of elections to local bodies. A newly elected leadership took over the reins of administration at all the tiers of local government. There are 1200 local governments in Kerala, which includes 941 Grama Panchayats, 152 Block Panchayats, 14 District Panchayats, 77 Taluks, 87 Municipalities and 6 Municipal Corporation.

One of the prominent features of Kerala’s decentralisation is the devolution of untied funds in a formula based, non-discretionary, and equitable manner. As per the recommendations of State Finance Commissions un-tied funds are devolved to the Local Governments in three streams ; (i) General Purpose Fund for meeting the expenditure on traditional functions and establishment expenses, (ii) Maintenance Fund for the maintenance of assets of Local Governments including those transferred as part of decentralization, and (iii) Development Fund (Plan allocation) for meeting the development expenditures.

The State transfers 3.5 per cent of its Own Tax Revenue as General Purpose Fund and 6.0 per cent of Own Tax Revenue as Maintenance Fund. About 25 per cent of the State's Plan outlay is devolved as Development Fund every year. Formula-based devolution has ensured funds have reached every corner of the State and moreso to backward areas. The transfer of resources as stated has ensured that adequate funds reach all areas thereby giving a boost to local area development and improving the lives of people. The surplus of revenue that remains after meeting the establishment and non-development expenditure, and surplus from General Purpose Fund, is used a source of funding for projects under Annual Plan.

2. Second phase of People's Plan

Kerala has nearly two and a half decades of experience in the field of people's planning. There have been many studies and discussions in the state in this regard. In the light of

these studies and discussions, some changes were initiated during the last four years, aimed at revitalisation of the system of decentralised democratic governance.

The last four years bears testimony to the fact that the scope and role of Local Governments has increased like never before and so has their efforts to achieve better and effective rendering of their functions and responsibilities. This is reflected in the timely preparation of plans by the Local Governments, integration of plan and budget, timely implementation and better utilisation of funds, formulation of innovative projects, increasing allocation of funds to the productive sector, preparation of district plans and planning with district as the focus, efficient disaster preparedness in the wake of natural disasters, etc

3. New initiatives and major policy changes introduced in the 13th Plan

New initiatives and changes introduced in the 13th Plan and its impacts are summarized below.

a) Modification of Plan Guidelines and Timely preparation of Local Plans

The first year of the 13th Plan witnessed some major changes in the guidelines for formulation and implementation of the Local Government Plans. An important objective of the new guidelines was to simplify the procedures so that delays could be avoided. On account of the cumbersome procedures that existed until then, the Plan formulation and its approval took more time than the time left for implementation forcing the Local Governments to rush through the process of implementation during the terminal months of the financial year. It was also responsible for the bunching of payments during the month of March.

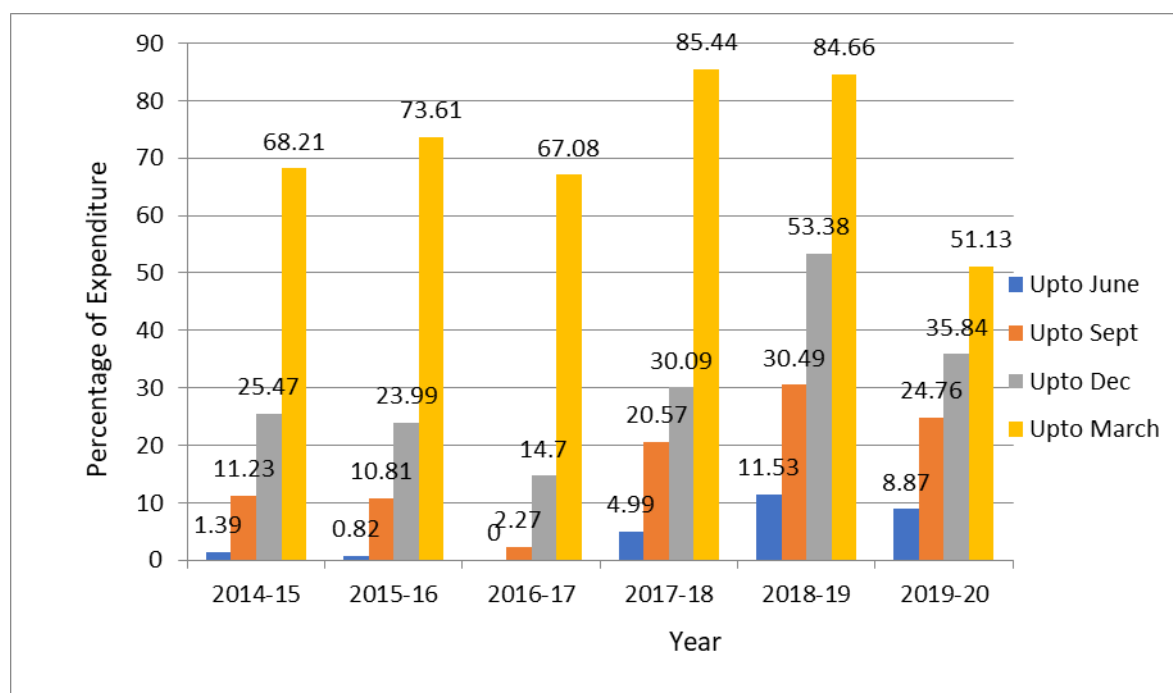
The introduction of new guidelines, which ensure simplified procedures and comparatively less planning phases, resulted in early submission of Plans. During the first year (2017-18), all Local Governments in the State could complete the process of formulation of their Annual Plans by June 15, 2017. This is an unprecedented achievement in the history of local level planning in the State. Accordingly, the year also witnessed early beginning of the implementation proces, thereby getting around 10 months' lead time for plan implementation.

Based on the experience of the first year of the 13th Five-Year Plan, the Plan guidelines as well as the subsidy guidelines have been modified for the remaining four years. Modification of the guidelines became necessary to incorporate the experience gathered from the first year and address issues raised by Local Governments. Modified guidelines were issued sufficiently early so as to enable the Local Governments to get the Annual Plan 2018-19 approved well before the beginning of the financial year. Accordingly, 1,147 Local Governments in the State could complete the process of formulation of Annual Plans for the year 2018-19 before April 1, 2018 leaving a full year for Plan implementation.

The process of formulation of the local Plans for 2019-20 began on October 2, 2018. The process was initiated early so as to finalise the Plan proposals well before the issuance of notification for the general election to the 17th Lok Sabha. Most of the Local Governments (1181) submitted Plans before the notification was issued. Even in the year 2020-21, in the midst of Covid-19 pandemic, 818 Local Governments were able to submit their Plans by March 31. Of the remaining LGs, all but four have submitted Plans by 21st April. The experience of the last four years reveals that the Local Governments have now realized the importance of timely preparation of Plans.

Early start of the Plan implementation resulted in higher expenditure. In the past, the money could be spent in the last months of the financial year as Plans were approved only at the end of the year. Now that has changed and from the first month onwards, the plan expenditure is recorded. That is, Plan activity has become a year-round process. See Figure 1

Fig 1: Quarterly Plan Expenditure figures during the years 2014-15 to 2020-21



Another important achievement of timely preparation of Plan is that the Annual Plan of the Local Governments could be integrated with the budget presented and passed in March. Until the beginning of the 13th Plan, the practice in Local Governments was to integrate the annual Plan with the Budget in the middle of the financial year. By integrating it with the Budget in March itself, the relevance and sanctity of budget has also increased.

b) More focus on urban issues

The 13th Five-Year Plan of the State places special emphasis on the issues arising due to rapid urbanisation in Kerala. It recognises the importance of developing appropriate strategies and programmes for coping with challenges and opportunities thrown up by

the process of urban growth. Keeping this in view, the Government had in the 13th Plan, for the first time set up a separate set of guidelines for Plan formulation in urban Local Governments.

c) Preparation of District Plans

Another notable initiative introduced in 2017-18 is preparation of District Plans by District Planning Committees (DPCs). It is a constitutional mandate (Article 243 ZD) that the DPCs make District Plans aimed at designing an integrated approach for the development of the District. All the DPCs in Kerala could complete this task, following the detailed guidelines issued by the State Government and thereby ensure that the suggestions in the District Plans are incorporated in the Annual Plans of Local Governments. DPCs have been instructed to issue district specific guidelines every year based on the District Plans before the process of preparation local Plans starts. Preparation of District Plans is a major achievement in the history of decentralised planning in Kerala.

After fulfilling the constitutional mandate, the DPCs in the State had undertaken the task of converting some of the ideas on large scale projects that emerged in the District Plans into implementable projects so that it can be jointly implemented by Local Governments and other agencies. Government had introduced a scheme, viz: *Incentivising District Plans*, for promoting such integrated projects in the District Plans.

d) Change brought in Approval system – First Plan approval and then project appraisal

In the past, the Annual Plan was submitted to the District Planning Committee for its approval, after the projects were scrutinized by the vetting officers concerned. The Annual Plan could only be submitted once the approval process for all projects had been completed. Since there was a pressure to submit the Annual Plan, often the vetting officers faced a situation where it was not possible to rectify the proposals addressing the shortcomings of the projects and the proposal were approved in haste. To avoid this, it was decided to submit the Annual Plan to the DPC first and then conduct appraisal of projects. This change helped to avoid delays in the approval of Annual Plans and hasty project vetting. Vetting officers now get enough time to scrutinize the projects in detail and rectify the deficiencies. This has resulted in improving the quality of projects significantly.

e) Provided more Vetting Officers and Implementing Officers

One factor that hindered the smooth implementation of projects, especially in construction projects, was the lack of facilities to scrutinize and approve projects in the respective Local Governments. Normally, appraisal (vetting) of a project is done by an officer who is senior to the Implementing Officer of the project. In the past, only the senior most officer among the officers transferred in a sector, was allowed to be engaged as the Implementing officer of projects in that sector. Because of this barrier, Local

Governments were forced to send projects to another office for vetting, which resulted in much delay. For instance, construction projects of District Panchayats and Corporations had to be scrutinized in the offices of the Superintendent Engineer or Chief Engineer. This barrier was removed by allowing more Implementing Officers and vetting officers. The newly assigned Implementing officers were given treasury codes (DDO code) also, for withdrawing money from the treasury.

f) Restructured the Appeal committee system

One criticism that arose in the Twelfth Plan was that the district-level appeal committee for projects rejected by vetting officers was bureaucratic in approach. The committee was reconstituted under the chairmanship of the Chairperson, District Planning Committee to address this issue.

g) Productive sector outlay enhanced

From the beginning of the People's Plan, it was stipulated that a fixed percentage of Normal share under General sector fund should be set apart for productive sector. However, in the beginning of 12th Five-Year Plan this was done away with. The experience in the first four years of the 12th Plan was reviewed by the present Government when it assumed office in May 2016 and a decision was taken to restore the mandatory minimum allocation with 20 per cent under productive sector, for the Annual Plan 2016-17. This was again revised in the beginning of the 13th Plan and the mandatory minimum ceiling in the productive sector was enhanced to 30 per cent in the case of Grama Panchayats, Block Panchayats and District Panchayats whereas in the case of Urban Local Governments it was fixed at 10 per cent. This facilitated or encouraged the Local Governments in allocating and taking up more projects in the productive sector who were until then concentrating on infrastructure sector. This signifies the emphasis given to enhance production as outlined in the Approach Paper to the 13th Plan. Details are given in Table 1.

Table 1 Share of Productive sector expenditure in the total expenditure under normal share of general sector funds of Local Governments (2015-16 to 2019-20), in Rs. crore

Year	Productive sector expenditure under normal share of General sector Funds	Total Expenditure in Normal share of general sector funds	Percentage share of productive sector expenditure in normal share under general sector expenditure (%)
2015-16	242.43	2400.98	10.10
2016-17	373.42	2040.85	18.30
2017-18	660.46	2750.19	24.02
2018-19	674.26	3330.11	20.25
2019-20	454.92	2445.03	18.61

h) More focus and higher outlay for Plans for Special Groups

Till the 12th Plan, it was stipulated that LGs should set aside five per cent of the Development Fund for the development of children, the elderly and the physically and mentally challenged. In order to give higher priority to the development of special needs groups it was decided, in the beginning of the 13th Plan, to increase the allocation upto 10 per cent and to include the transgender community under special groups also. Now, Local Governments have to earmark 5 per cent for the development of children, the physically and mentally challenged and transgender, and another 5 per cent for the welfare of the elderly and the palliative care projects.

i) Broadening the Scope of subsidies

A notable change in the 13th Plan is that the subsidy norms have been comprehensively revised. Scope of subsidies that can be disbursed through Local Government Plans has been broadened by including more items. Further, subsidy rates have been increased and unified with the Department rates. Local Governments are permitted to take up those schemes' which are not in the subsidy guidelines but existing in the Departments, in accordance with the Department guidelines. Besides, income ceiling of beneficiaries has been enhanced substantially. In the agricultural sector, benefits can be given to marginal and small farmers. For paddy cultivation benefits can be given to farmers who have more than five acres of land also. For animal husbandry, dairy and fisheries sectors the income limit has been raised to Rs 5 lakh. Whereas, the income limit for housing has been raised to Rs 3 lakh. For other schemes income ceiling has been enhanced to Rs.2 lakh for general category and Rs. 3 lakh for SC category. Income limit for Scheduled Tribes has been waived.

j) Special window for Innovative programmes

Another feature of 13th Plan was the introduction of 'Special Window of Innovative Programmes' for designing schemes that are innovative and relevant but cannot be taken up by the LGs as per the subsidy guidelines. One of the key objectives of decentralized planning is to analyze the specifics of local development problems and formulate appropriate solutions based on the resource potential of that area. However, many of the projects thus emerged may not be implemented in accordance with the existing subsidy norms. A District Level Expert Committee chaired by the District Collector was constituted to examine and approve such projects. This committee is to examine the innovative projects of the Local Governments at all levels and decide on the approval.

k) More investment through tender savings

There were widespread complaints in the construction works being carried out by the Beneficiary Committees. In order to address this issue and to ensure transparency in the system, in the beginning of 13th Plan, competitive tendering was introduced in the execution of public works in the place of Beneficiary Committees. The financial ceiling of such projects was reduced from Rs. 5 lakh to Rs. 50,000. However, this does not apply to Approved Agencies such as the Parent Teachers' Associations. Permission was granted to entrust works upto Rs. 25 lakhs to such committees.

As a result of introducing competitive tendering, there has been substantial increase in tender savings to the tune of Rs. 657.45 crore in the first three years of the 13th Plan, which helped the Local Governments to take up new projects. Details are given in Table 2.

Table2: Tender savings out of Plan and Maintenance Fund of various tiers of LGs in 2017-18, 2018-19 and 2019-20

Year	Tender savings (Rs. Crore)
2017-18	239.60
2018-19	212.23
2019-20	205.62
Total	657.45

Source : LSGD Engineering Wing

1) Initiatives for enhancing people's participation and providing technical support

Enhanced public participation in local plans is one of the main objectives of the 13th Plan. With this objective, some reforms have been initiated. Important among them are the decisions to increase the participation of experts and use the services of volunteers. Planning committees were formed in all the LGs and the participation of volunteers and experts has been ensured in this committees. It was also suggested to use the services of a volunteer expert to assist the Local Governments. Permission was also given to Local Governments to give an honorarium of Rs. 5000 per month to the resource persons so appointed. LGs were given complete freedom in selecting resource persons.

In order to make the planning process more participatory, a Gramasabha portal was developed to receive the views of public, including expatriate Malayalees. Another initiative introduced for enhancing participation and for improving the knowledge content of the Plans prepared by the Local Governments is the formation of District Resource Centres. In September, 2019 Government directed all DPCs to form District Resource Centres consisting of professionals from development, research, and technical

institutes as well as retired experts from Government departments. The main functions of DRC are a) to conduct studies in areas and topics required by the DPC as well as the Local Governments b) give technical advice so as to improve the knowledge content of the Local Government Plans, c) to prepare DPRs on projects as required by the Local Governments, d) to scrutinise the Plans prepared by Local Governments and point out the weaknesses and suggest measures to improve it e) study the model projects and bring it to the attention of the State and f) revision of the District Plan every year. It is expected this will help in improving the quality of Plans of the Local Governments and in turn give emphasis to areas that require core attention.

m) Enhanced outlay given to LGs

Plan outlay for the Local Governments has been gradually increased. The Government has implemented the decision in the Action Taken Report on the recommendations of the 5th SFC that the plan outlay should be enhanced by 0.50 per cent every year from 2017-18. The Government decision to increase gradually the Maintenance Fund allocation from 5.5 per cent to 6 per cent of the state's own tax revenue has also been implemented. In addition 3.5 per cent of State's Own Tax Revenue was given as General Purpose Fund. Details on devolution of untied funds are shown Table -3 and Table-4.

Table-3
Plan Outlay (Development Fund) to Local Governments
(Rs. crore)

Year	State Plan Outlay	Allocation to LGs					Percentage to State Plan Outlay
		General Sector		Scheduled Caste Sub Plan	Tribal Sub Plan	Total	
		Normal share	Central Finance Commission Award				
2016-17	24,000	2995.04	1310.06	1038.90	156.00	5500.00	22.92
2017-18	26,500	3371.57	1507.88	1172.05	176.00	6227.50	23.50
2018-19	29,150	3777.58	1739.56	1289.26	193.60	7000.00	24.01
2019-20	30,610	3604.62	2338.55	1353.84	202.99	7500.00	24.50
2020-21	27,610	3534.60	1964.15	1221.15	183.10	7158.00*	25.92

** Includes Rs.255 crore for the World Bank aided project of Kerala Solid Waste Management Project (KSWMP) in Municipalities*

Source: Budget Documents, various years

Table -4
Devolution of Maintenance Fund and General Purpose Fund to Local Governments
(Rs. Crore)

Year	Maintenance Fund	General
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	Non-Road	Road	Total	Purpose Fund
2016-17	645.93	1291.86	1937.79	1233.14
2017-18	655.03	1528.41	2183.44	1364.66
2018-19	703.16	1640.72	2343.88	1426.71
2019-20	822.34	1918.78	2741.12	1626.09
2020-21	883.15	2060.68	2943.83	1717.23

Source: Budget Documents, various years

4. Other initiatives introduced in 13th Plan

a) Making audit of accounts up to date

The audit arrears of Local Governments for the years upto 2015-16 had been cleared through a special drive initiated by the State Audit Department in 2016-17 and now audit of accounts is up to date. This was a mandatory condition to seek performance grant suggested by 13th FC. As per the scheme guidelines for receiving Performance Grant the LGs will have to submit audited accounts that relate to year not earlier than two years preceding the year in which the LGs seeks to claim the performance grant.

b) Preparation of Disaster Management Plans

In light of the frequent natural disasters and climatic variations affecting the State, calamities like flood, coastal erosion, drought and landslides are posing serious challenges to the State as well as its economy. To mitigate the impact of such disasters and to improve the disaster preparedness, for the first time in the country, Grama Panchayats and Urban Local Governments were directed to prepare local disaster management Plans. The Disaster Management Plan of the Local Government will consist of the following components, a) LSG profile b) Hazard and Vulnerability profile c) Capacity and Resources of the Local Government, d) Response Plan and e) Preparedness, mitigation and community resilience Plan. The Local Governments have to include projects of disaster management and mitigation in their Annual Plans considering the susceptibility of the respective Local Governments to natural disasters as well as their existing capacity to tackle it. All Grama Panchayats, Municipalities and Corporations have prepared Disaster Management Plans in 2019-20.

c) Decentralisation round survey

Even though two decades has passed since the launching of decentralisation in Kerala, we have not succeeded in developing a data collection and dissemination system capable of supporting the local level planning in Kerala. Information Kerala Mission collects data on Plan schemes while the Local Governments themselves collect data on development sectors and use it for local level planning. However, there is a huge data gap with respect to the achievements as well as effectiveness of local Plans.

Considering that this is the most appropriate time for initiating such a data collection round when the period of the incumbent elected representatives will end and new representatives will assume office, the Government has decided to conduct a data collection round called the 'Decentralisation round' survey, where data regarding the achievements of Local Governments with respect to subjects dealt by them will be collected based on a questionnaire. This data collection will not only help in assessing the functioning of the incumbent Local Governments but also help the elected representatives assuming office after the next election to plan future programmes and priorities. It will help in identifying model projects, learn from the functioning of exemplary Local Governments; learn from past experiences, and acquire new knowledge. The data collection and compilation responsibilities will be handed over to the Directorate of Economics Statistics personnel. It is planned to conduct this round every five years. This will be a rich source of information for all the researchers and planners in future.

d) Good Governance initiatives

Some of the reforms initiated aimed at good governance are outlined below.

(1) Common Service for Local Self Government Department

The Integrated Local Self Government Department has been formed, unifying five Departments of LSGD, with a view to strengthen local government system and better service delivery. It is expected that the functioning of various Local Governments now comes under different Departments can be better coordinated. The existing Departments of Panchayats, Urban Affairs, Rural Development, Town Planning and Engineering Departments will come under the new umbrella.

(2) Integrated Local Governance Management System

Integrated Local Governance Management System (ILGMS), a comprehensive software developed by the Information Kerala Mission, will be deployed across 150 Grama Panchayats in September end, to ensure greater transparency, accountability, accuracy, punctuality and technical supervision in providing various services to the citizens. It is a vision for typical governance management with a suite of satellite software applications integrated to a stem software application (workflow platform.)

The project is being piloted in Chemmaruthi Grama Panchayat in Thiruvananthapuram District. At present, only applications for marriage registration and name registration in the case of Birth certificate are possible for e-filing through the *Sevana* software intended for birth, death and marriage registrations. Documents need to be produced even if they are e-filed. However, with the introduction of the new software, all services such as birth, death, marriage registration, name addition and correction can be applied for without having to go directly to the Local Governments and the services will be available online in a timely manner.

(3) Rise of Local Governments in Kerala to ISO standards

The Approach paper for the 13th Plan States that all Local Governments in Kerala would be raised at par to the ISO standards. This has now been almost accomplished and the Local Governments in Kerala are in the forefront in delivering quality service to the people in a time bound manner. Of the 941 Grama Panchayats in Kerala, 939 GPs and all Block Panchayats have achieved international quality certification ISO 9001: 2015. Remaining Grama Panchayats, Municipal corporations, municipalities, and District Panchayats are expected to adopt the ISO for the current fiscal year.

ISO 9001: 2015 is an international certification for quality management system. Local Governments have strived for this international recognition because they have a clear understanding that only with a high-quality system, they can provide timely services to the people. The ISO certification is given only if the system is designed such that people receive uninterrupted services and the local bodies provide a people-friendly and accurate front office system, a computerised record keeping system that can record records in a very short time, and an orderly office system. The work done by Local Governments to achieve international certification is a major step towards the goal of providing a quality service to the people and being a people- friendly organisation.

5. Floods and Local Governments

The Local Governments were at the forefront in the aftermath of floods of 2018 and 2019 in rehabilitating people as well as coordinating the relief efforts. All Local Government staff from Grama Panchayats to municipal corporations – were instructed to work in rescue and relief operations and, most importantly, start using their funds as they deemed fit. This helped in avoiding unnecessary confusion and responding quickly to situations. It also paved a smooth way for the teams for disaster mitigation to carry out their mission effectively.

Of the two floods that ravaged the State in two successive years, 2018 flood was the worst. The Local Governments were permitted in August 2018 to reorient and rearrange their 2018-19 Plan so as to address the critical problems that require immediate attention. Relaxation in sectoral norms was allowed. The provision given for liberal rearrangement of the local Plan helped the Local Governments to mobilise enough money for repairing and renovating public assets such as roads, bridges, drinking water schemes, and public buildings.

In the backdrop of the natural disasters, especially the devastating floods, Local Governments were instructed to form a new working group for 'Biodiversity Management, Climate Change, Environmental Protection and Disaster Management'. The Working Group, to be chaired by respective Local Government heads, should have experts in the aforementioned fields as members. The group that should include members from the Biodiversity Management Committee and Disaster Management Committee, should also draw members from the public, including volunteers who were

part of rescue and relief operations in floods. The respective Local Government secretary will be convenor of the Group.

Further, Local Governments were directed to draw lessons from the flood and lay thrust on spatial planning at the micro-level to mitigate the impact of such disasters in future. The local spatial Plan will be on the basis of the District Plan already drawn. The idea is to come up with comprehensive Plans for spatial rearrangement or development which is essential for sustainable development in general and rehabilitation of people who live in ecologically highly sensitive areas prone to flooding and landslides. Such rethinking in the spatiality of development at the local level will have to be in agreement with larger master plans which the State Government would be formulating for different macro-regions of the State such as Western Ghats, Kuttanad, and Periyar river system.

The Government also directed all Local Governments to form four Emergency Response Teams (ERTs) in each Local Government to lead the rescue and relief operations and give first aid in the wake of a disaster. They also have to find out possible community centres that can be converted into relief camps and ensure maintenance of such centres by having toilets, lights and sanitation measures. Considering the intensity, frequency, and uncertainty of natural disasters ravaging the State, the Disaster Management Plan is a novel and pertinent measure taken by the Government worth emulating all over the country.

In the Annual Plan 2019-20, Rs.250 crore was allocated for giving assistance to the Local Governments seriously affected by the floods of 2018. A committee was constituted to select the Local Governments eligible for assistance and decide on the criteria to distribute this fund among the selected Local Governments. As per the recommendation of the Committee, the Government decided to keep 15 per cent of the fund i.e. Rs. 37.5 crore for distributing among the Local Governments seriously affected by landslips and landslides and the remaining fund of Rs 212.50 crore be distributed among the selected flood affected Local Governments. Accordingly, 240 GPs, 33 Municipalities, and 3 Corporations received Rs 169.04 crore, Rs 35.85 crore and Rs 7.61 crore respectively as special incentives. Subsequently the Government also issued guidelines for the utilisation of this funds wherein it was stipulated that the fund should be primarily used for livelihood generation projects benefitting mainly those who have lost their livelihood due to the floods of 2018. It also permitted that the fund can be used for restoration of public assets lost in the floods and also for repair and maintenance of rescue shelters in the wake of floods.

6. Role played by the Local Governments in tackling Covid -19

Among the Indian States, Kerala was the first state affected by Covid-19. The State Government's prompt response to the pandemic in rallying Local Governments along with the Health Department has been noticed globally. Social investments in rural health care, universal education, decentralisation of powers and resources and women

empowerment are cited widely as the reasons that helped Kerala to fight against the coronavirus.

BOX

Local Governments played a key role in containing as well as tackling this pandemic, some of which are described below (status given is as of June 30).

1. Setting up and managing community kitchens during lock down: Local Governments in association with Kudumbashree started 1374 Community Kitchens to ensure food for needy especially migrant workers, job losers, aged, palliative care patients, stranded persons, peoples who admitted in quarantine destitute, etc. Over 95 lakh food parcels have been distributed from here. Of this, 82 lakh parcels were distributed free of cost.
2. Cleaning and disinfection activities: As part of cleaning activities, 76,067 public places and offices were disinfected. For this, 86,470 person-days were used. 6.91 lakh person-days were used as part of pre-monsoon cleaning operations.
3. Organizing and running “break the chain” social distance campaign and awareness programmes: Awareness programs for the elderly, the disabled and the sick have reached 24 lakh families. Special awareness programs for SC and ST families were extended to 9.49 lakh families. A total of 17,122 people participated in the awareness programs conducted for the inmates staying in various care homes in the state.
4. Providing accommodation, food and other essential support to guest workers (migrant labourers). Around 3,032 camps were organized for guest workers, and 46,657 inmates were present here at various times. 173 camps were set up for the poor and beggars, where 4,549 people were rehabilitated at various times.
5. Managing the coordination of home quarantine, counselling and isolation
6. Setting up institutional quarantine to manage those, who returned to the state from other states and abroad
7. Setting up and managing Covid First Line Treatment Centres: The government has decided to set up Covid First Line Treatment Centers in all local governments in view of the increasing number of Covid positive patients in the state. So far 1437 CFLTCs have been identified out of which 1,20,832 beds have been set up.
8. Engaging of personnel in Health institutions managed by Local Governments: During this period, 463 doctors, 290 nurses, 308 paramedical staff, 388 junior health inspectors, 1779 cleaners and 793 other personnel were posted in various health institutions managed by the Local Governments.
9. Purchase of medicines and other equipment to the hospitals run by the Local Governments:

10. Distribution of free medicines: During this period, medicines were delivered to 5.83 lakh people at their homes
11. Implementing local economic plans to help the people who lost jobs and plans for increasing food production and self-sufficiency in the field of agriculture.
12. Providing arrangement for local dissemination of online schooling internet connectivity

7. Reorientation of Local Government Plans (2020-21) in accordance with the Award of 15th Fifteenth Central Finance Commission

The XVth Central Finance Commission has made significant departures from the previous Central Finance Commissions in its recommendations particularly in urban areas. The salient features of XVth FC Award to Local Governments and its implications in Kerala are summarized below.

As per the accepted recommendations of the XVth FC, the total grants for Local Governments to 28 States for 2020-21 has been fixed at Rs 90,000 crore, of which Rs 60,750 crore is recommended for Rural Local Governments (67.5%) and Rs 29,250 crore for Urban Local Governments (32.5%). This allocation is 4.31% of the divisible pool estimated by the commission for 2020-21 against 3.54% (Rs. 87,352 crore) of the divisible pool for 2019-20. Out of the total amount, Rs.2412 crore (2.68%) has been recommended by the Commission to the State during the year 2020-21.

In the case of Rural Local Governments the Commission has recommended to give grants to all tiers of Panchayats including Intermediate and District Panchayats. Where as in the case of Urban Local Governments the Commission recommended to provide grants to cities under two categories for the first time: (a) fifty Million-Plus urban agglomerations⁴⁷/cities and (b) all other cities and towns with less than one million population.

(a) Rural Local Governments (RLGs)

The Commission recommended to give grants to RLGs under two streams namely, (i) Basic Grants and (ii) Tied Grants. Fifty percent of the total grant will be Basic Grants and fifty percent will be the Tied Grants. Total allocation to Kerala is Rs. 1628 crore. As per the recommendation, the grants should be distributed in conformity with the following bands of 70 per cent - 85 per cent for Village Panchayats, 10 per cent - 25 per cent for Block Panchayats and 5 per cent - 15 per cent for District Panchayats. Kerala decided to apportion the funds among the Village, Block and District Panchayats in the ratio of 75 : 12.5 : 12.5. The inter-se distribution among the RLGs has been done, as suggested by the XVth FC, on the basis of the accepted recommendations of the latest State Finance Commission (i.e Vth SFC)

⁴⁷ An urban agglomeration is a continuous urban spread comprising of a town and its adjoining outgrowths (OGs), or two or more physically contiguous census towns/statutory towns together with or without outgrowths of such towns

The basic grants are untied and can be used by RLGs for location-specific felt needs, except for salary or other establishment expenditure. The Tied Grants are to be used for the basic services of (a) sanitation and maintenance of open-defecation free (ODF) status and (b) supply of drinking water, rain water harvesting and water recycling. The Local Governments shall, as far as possible earmark one half of these Tied Grants each to these two critical services. However, if any Local Government has fully saturated the needs of one category, it can utilise the funds for the other category.

(b) Urban Local Governments (ULGs)

As described earlier the Commission recommended to provide grants to ULGs under two categories: (a) fifty Million-Plus urban agglomerations/cities (including seven UAs in Kerala) and (b) all other cities and towns with less than one million population. Of the total grant (Rs 29,250 crore) allocated to ULGs across India, Rs. 9,229 crore is for the Million- Plus cities and Rs. 20,021 crore for the others.

Category 1- Million-Plus Urban Agglomerations/ cities

There are 50 Million plus Urban Agglomerations in the Country (as per 2011 census). A portion of funds under this category (Rs. 4400 crore out of Rs. Rs. 9229 crore) has been recommended for improving air quality. However, no fund is set apart for Kerala under this stream - as ambient air quality is not a problem in the seven, Million plus Urban agglomerations identified in Kerala (The seven UAs in Kerala are Thiruvananthapuram, Kollam, Kochi, Thrissur, Kozhikode, Kannur and Malappuram).

The balance fund (Rs. 4829 crore) has been recommended for improving conservation of supply and management of water and efficient solid waste management, which are critical for planned urbanisation. For water and solid waste management, the Ministry of Housing and Urban Affairs (MoHUA), as the nodal ministry, shall, in consultation with the State Governments, develop city-wise and year wise targets for 2020-25 and recommend disbursal of grants to such cities. The targets will be improvements over the base year to provide incentives to make up for any slippage in performance during the years succeeding 2020-21. Allocation to Kerala under this stream is Rs. 339 crore as given in Table-5.

Table-5
Allocation to One Million Plus Urban Agglomerations in Kerala

Sl No	UA	Population in lakh	Allocation in Crore (based on population)
1	Thiruvananthapuram	16.8	47
2	Kollam	11.1	31

3	Kochi	21.2	59
4	Thrissur	18.6	52
5	Kozhikode	20.3	57
6	Kannur	16.4	46
7	Malappuram	17.0	47
	Total		339

Category 2- Urban LGs other than One Million Plus cities

For ULGs other than in Million-Plus cities across India, the Commission recommended an allocation of Rs. 20,021 crore consisting of two equal parts - 50 per cent Basic Grants and 50 per cent Tied Grants. The Basic Grants are untied and can be used by ULGs for location-specific felt needs, except for salary or other establishment expenditure. However, Tied Grants are to be spent for (a) drinking water (including rainwater harvesting and recycling) and (b) solid waste management. These ULGs shall earmark one half of the Tied Grants each of the above two critical services. However, if any Local Government has fully saturated the needs of one category, it can utilise the funds for the other category

Allocation to Kerala under Category-2 is Rs. 445 crore. The inter se distribution has been done, as suggested by the XVth FC, on the basis of the accepted recommendations of the latest State Finance Commission (i.e Vth SFC). The lone Cantonment Board in Kerala viz; Kannur Cantonment Board was provided with funds from the allocation under Category-2.

Reorientation of LG Plans (2020-21)

At the time of preparation of State Budget for the year 2020-21, the details of XVth CFC award to Local Governments were not known. Therefore the Local Governments were provided with a tentative allocation in the budget and directed to prepare Annual Plans well before the start of the financial year on the basis of this tentative allocation and as per the 14th FC guidelines.

After the 15th FC Report came, in June 2020, the Development Fund allocation to Local Governments was modified incorporating the 15th FC allocation. Subsequently Local Governments were directed to reorient their Plan in accordance with the revised allocation and as per the 15th FC guidelines.

The guidelines issued by the Kerala Government for the utilisation of 15th FC Award, stipulate preparation of a CFC Sub Plan by the Local Governments. It was quite a challenge to prepare Plans for an Urban Agglomeration Area instead of the usual practice

of preparing separate Plan for each Local Government that comes under an UA. For the purpose of preparation of Plan for the UA area, Kerala Government has asked the District Planning Committees concerned to constitute a Joint Planning Committee (JPC) with the elected head of the Principal LSG as the Chairperson of JPC and the Chairpersons of other Local Governments within the UA area and Secretaries of all LGs concerned being the members of the JPC. The guidelines issued by the Government stipulate mandatory spending of a portion of the allocation in areas other than the principal LG of UA.

Undoubtedly, the 15th FC has enhanced allocations for Local Governments across India to 4.31% of the divisible pool, as against 3.54% recommended by the 14th FC for 2019-20. As a result of this, allocation to Kerala has increased as compared to 2019-10. However, flexibility in spending is reduced to a considerable extent. In a major departure from the 14th FC, that gave bulk of the funds as “Basic Grant” and allowed all expenses related to basic civic services including maintenance of community assets and roads in the case of both rural and urban Local Governments under Basic grants, the 15th FC has made all the grants to the million-plus cities as conditional (Tied grants), and 50% of the grants to other cities and rural Local Governments as conditional (Tied Grants). Further, only two critical services, water and sanitation, are allowed under tied grants. All these goes against the spirit of decentralization and empowering Local Governments.

Way Forward

Local Governments in Kerala have become model institutions of governance rising up to all challenges. In fact, it is because of the effective system of local governance that Kerala has managed to successfully tackle every crisis that has come its way. Functional and financial autonomy has ensured effective decentralisation of governance. In the last four years, the system of local governance has been strengthened further and made more effective. The Local Governments have become the face of development in the State.

A number of Local Governments have made effective use of the positive features of decentralisation to make progress in various spheres of development. The experience of the last 24 years reveals that many Local Governments have created successful models in various fields.

The main objective of local level planning in the future should be to address regional inequalities, improve the living standards of the poor; especially marginalized sections such as Scheduled Castes, Scheduled Tribes and fishworkers and create employment opportunities. It is also necessary to increase production and productivity; particularly in the field of agriculture and allied sectors and industries. Small scale industries need to be encouraged. The Urban Local Governments should be empowered to address the challenges and problems that arising due to fast urbanisation.

There needs to be a positive change in the approach and outlook of the Women Component Plan in accordance with the possibilities and needs of each region. Special attention is needed for the development of children, the elderly, the disabled and the transgender. The quality of public services should also be improved.

Though serious efforts have been taken to improve public participation in local level planning, the fact is that it has not been able to succeed significantly. The efforts need to be continued and lost public participation need to be recovered.

Efforts taken in the 13th Plan to strengthen the District Planning Committees need to be continued further. Local level spatial plans should be prepared and a system should be devised to provide reliable local level statistics required for planning. The district plan should be constantly updated and a system of formulating local plans in line with the district plan should be strengthened.

CHAPTER 8

HUMAN RESOURCES: UNLEASHING THE POTENTIAL

CHAPTER 8.1

KERALA'S LABOUR FORCE AND DEVELOPMENT

Kerala's economy has experienced vast changes since the mid 1960s. From being predominantly a rural agrarian economy growing at low rates it has remarkably transformed into a high growth service oriented economy since the early 1990s. From being a low income state during its status as an agrarian economy it has also become one of the high ranking states in terms of per capita income. On the demographic front, it has successfully transitioned from high-birth-death rate to low-birth-death rate. On the social front, Kerala has been the harbinger of a new developmental model that focused on the basic facets of 'human development' without getting bogged down with the usual trappings of economic growth. It has witnessed large scale international migration of low skilled and semi skilled workers. Kerala has also effectively been utilized as a laboratory of political, social, welfare and governance experiments aimed at empowering people and bringing the vulnerable under safety nets. These changes have been taking place in the larger context of liberalization and globalization of the Indian economy as a whole. While the effects of globalization of the Indian economy has had generalized effects, one of the specific ways in the Kerala economy was affected was through its attempts towards creation of "investor friendly" business environment in the wake of international competition and foreign investment flows. These economy wide changes have impacted on the economy as a whole in general in many ways. Yet, one of the most profound effects has been on the labour market within the economy.

The structure of both the supply and demand for labour has had prolific changes. The supply side is affected mainly by the changes in demographic structure and levels of human development. While, the demand side is affected by the acceleration in growth, per capita income and its structural shift to a service oriented economy. There are also possibilities of reverse causation wherein, high income levels and migration may also influence labour supply decisions. Empowerment and social security of workers also influence supply decisions, while labour market institutions may negatively impact the labour demand. With the advent of globalization the pressure for 'flexible' labour market has also been mounting.

Past literature on Kerala's labour market had argued that the gains made through social and human development, political empowerment and institutional reforms had successfully enhanced wages in the state, while their ability to tackle unemployment had been mediocre. In fact, high rates of unemployment, especially unemployment among the educated have been identified by

many authors as the visible face of the mismatch between economic growth and human development in the economy. But not much is known about the recent changes in the employment scenario, since the emergence of Kerala as a high growth economy with substantial changes in the labour market. Yet another significant change is in terms of nature of employment. It is worth noting that In Kerala there is a marked shift in the nature of employment from casual wage employment to regular wage employment and the casualisation trend has been arrested. Considerable change has been taking place in the labour force participation, even with respect to gender dimensions.

Unemployment in Kerala: Kerala has high unemployment rates, compared to the All India average. This pattern had been stable for at least the last three decades and is true across all measures of unemployment. The All India average of UPSS unemployment rate of 2.14 percent, a measure of full open unemployment is very low compared to developed economies. Studies show that such low levels of unemployment in developing country context where there is hardly any social security cover and limited personal wealth to enhance the reservation wages, shows distressed employment. People with low levels of income are forced to enter the labour market as they do not have the power to hold back their labour, a very important determinant of the bargaining power of workers. Moreover, the low level of unemployment at the national level is also due to the still large presence of agriculture sector as an absorber of surplus labour in the economy.

Unlike this Kerala's conventionally high unemployment had been driven by two important factors. Firstly, the high reservation wages that has emerged in Kerala. The high reservation wages in Kerala has its roots in many factors, two of which are noteworthy. Institutionalised wage bargaining processes that has taken deep roots in Kerala has been successful in keeping the average wage rates high, especially in the casual wage employment. Though this institutional wage rates does not represent individual reservation wage rates, effectively such wage setting acted as the reservation wages as large share of the unorganised sector was unionised. Moreover, such organised forms of labour, especially in the casual wage employment sector led to the development of welfare oriented social security system. At the same time, the Kerala economy was witnessing flow of remittance income, which also increased the reservation wages in the economy. Expectations of wages were driven by the institutional wage setting and the handsome wage earnings of the international migrants.

But apart from these supply side factors, the demand side factors were not supportive of employment growth in the state. Large swathes of agricultural land remained fallow as labour costs mounted on the one side, and at the same time, land became more of a speculative asset than productive asset. With the

land prices in the suburbs and even in the rural areas shooting up, mainly driven by remittances, land purchase and sale presented a lucrative arbitrage based rent seeking opportunity. With such rise in land prices, investment in land for productive activities was considered less important. Large regions of paddy land was converted to coconut farms, as a way to reclaim the low lying water logged land to dry land, thus to enhance its market value. High and mid land farming were now converted to plantation crops. Thus while on the one side labour intensive agriculture as an economic activity retarded from prominence, on the other cropping pattern shifts now demanded much less labour, reducing the labour absorbing capacity of the primary sector.

Modern industrial growth had very limited success in Kerala after a successful early run soon after independence. Infrastructural bottlenecks restricted the growth of modern productive sectors. The conventional agro-based industries such as coir, cashew etc were now losing out due to poor productivity and low competitiveness. Labour militancy, bureaucratic interference and environmental activism had also arguably played important role in the keeping manufacturing sector growth at low levels. Services sector did grow in a big way. However it was not the traditional labour intensive services that led the growth, rather tradable services whose value addition was mainly on account of exports from Information technology sector, business and retail activities, though the conventional services such as trade remained vibrant due to the consumerist society that Kerala was developing into. These developments in the production arena implied that the labour absorption was very low, and at the same time reservation wages and institutional wage setting has pushed a large section of the working population to remain unemployed. Thus we see that even in 2011-12 when the national level unemployment rate was only 2.2 percent in Kerala this was at 6.6 percent. By 2017-18 when the national full open unemployment rate increased to 6 percent the corresponding unemployment rate in Kerala was 11.4 percent.

Even by Kerala's high unemployment rate standards this is quite high (table 1). However, another disquieting feature of the current spate of unemployment is the drastic rise in CDS unemployment rate. The CDS unemployment rate in Kerala is 23.2 percent in 2017-18. This can be interpreted as for those who were in the labour market for all the time they spend in the labour market, nearly a quarter of it was spend on searching for employment. Compare this with the previous period 2011-12, the CDS rate was 14.6 percent. The gap between CWS and CDS rates was about 4 percentage in 2011-12 which shot up to 9 percentage in 2017-18. This meant that those who were underemployed had increased in Kerala between the two periods.

This again is a matter of concern. Maturing labour markets usually show a pattern where underemployment starts declining and open unemployment starts rising. This is because of better fall back mechanisms. However, the rise in both unemployment and underemployment in Kerala, as in All India does not signal any betterment in the unemployment conditions, rather it seems to be getting worse.

Table 1: Unemployment rates in India and Kerala (in percent)

	All India		Kerala	
	2011-12	2017-18	2011-12	2017-18
UPSS	2.14	6	6.6	11.44
UPS	2.69	6.39	8.98	12.27
CWS	3.62	8.74	10.11	14.83
CDS	5.5	12.6	14.6	23.2

Source: Same as Table 1

What are the sources of such high rates of unemployment in Kerala. The open unemployment (UPSS) rates increased for all categories during 2011-12 and 2017-18, rural males and females; and urban males and females. However the magnitude of this change varied. The increase in UPSS unemployment was strongest among females. For rural women it increased from 14.12 percent to 19.6 percent and for urban women it increased from 13.9 to a whopping 27.4 percent. Though the male unemployment rates increased, it was much lower scales. For the urban women the rise in UPS unemployment rates from 19.2 to 30.7 percent shows that about third of the women who spend substantial amount of time searching for work could not find employment.

Yet there is a very interesting difference in the pattern in unemployment between males and females. For the males, the rise was in CDS unemployment which is a signal of underemployment. The gap between CWS and CDS for rural males increased from 6 percentage in 2011-12 to 11 percentage in 2017-18 and urban males this increased from 4 percentage to 9 percentage during the same period. While for rural females this gap declined from 7 percentage to 4 percentage and for urban females this declined from about 4 to 3 percentage during the same period. Thus , for the males in general the underemployment increased and for females this declined. For females the open unemployment increased sharply and much more than the male unemployment rates. We can say thus that though both unemployment and underemployment are increasing in Kerala, the victims of these are different population groups, rising open unemployment for females, and rising underemployment for males.

Unemployment across age group show that the problem is most prominent in the age group 15-29 followed by the age group 30-44. The unemployment rate for the age group 15-29 was 24.54 in 2011-12 which increased to 39 percent. For the age group 30-44 the unemployment rate increased from 5.8 percent to 9.51 percent. While for the age groups above 44, the unemployment rates remained low and also declined during 2011-12 to 2017-18. Unemployment was the severest among young rural females and young urban females at 65 percent and 68 percent in 2017-18. However, for males also the rates were very high at 21.3 and 29.4 percent in rural and urban areas respectively. For females the unemployment problem is reaching high levels in the age group 30-44 as well, at 18 percent and 29 percent in 2017-18.

Table 2 : UPS Unemployment rate (in %) by age groups in Kerala for 2011-12 & 2017-18

	Rural Male		Rural Female		Urban Male		Urban Female		Total	
	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18
15-29	11.75	21.34	58.63	64.95	9.38	29.44	44.76	68.2	24.54	38.08
30-44	2.3	3.28	14.54	17.93	1.13	2.96	13.43	28.9	5.8	9.51
45-59	0.81	0.89	8.3	0.87	1.65	1.85	3.12	3.27	2.72	1.46
60 >	0.1	0.52	2.92	0	2.9	0.48	8.1	7.22	1.42	0.96

Source: Same as Table 1

Unemployment among the educated had been a very serious area of concern in Kerala. This trend continues to accentuate during the period 2011-12 to 2017-18. Unemployment rate was highest among urban and rural women with higher secondary levels of education. More than half of such women who were in the labour market remained unemployment for more than six months during 2017-18. This was rate was high at 34.5 % and 29.7% during 2011-12. The rate of unemployment among educated has risen across all categories. The rise was much higher in the group graduates and above, thus accentuating unemployment among the highest educated in Kerala. This is really worrisome as Kerala has an increasing share of population who are undergoing higher education. Inability to fulfil the employment aspiration of higher educated has consequences not only of livelihood, but also that of social nature. It is essential that the future of Kerala's development path is locked on to the future of this educated.

Table 3 : UPS Unemployment rate (in %) by education levels in Kerala 2011-12 & 2017-18

	Rural Male		Rural Female		Urban Male		Urban female		Total	
	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18
Primary & Middle	1.3	2.0	8.1	0.9	2.7	0.7	2.4	3.0	3.1	1.6
Secondary	3.7	4.3	28.3	11.9	5.4	5.0	22.9	34.4	10.2	8.2
Higher Sec diploma	10.8	9.0	34.5	51.7	4.3	13.6	29.7	54.6	18.4	24.2
Graduate&above	12.5	21.1	41.3	16.6	6.6	17.3	33.1	44.6	19.2	22.5
	13.3	21.5	43.1	48.3	5.4	15.0	25.6	39.4	20.8	30.8

Source: Same as Table 1

As noted earlier, there is a marked shift in the nature of employment from casual wage employment to regular wage employment. For the first time we see a larger share of regular wage workers than casual wage workers. Thus the casualisation trend is arrested during this period. The total casual wage employment declined from 37 % to 30% during 2011-12 to 2017-18. While regular employment increased from 28% to 35%. This welcome change in employment is mainly due to the increasing regular wage employment among women both in the rural and urban areas. For males also the regular wage employment increased in the rural areas, but not in the urban areas. For rural females the regular wage employment increased from 30.1 to 46.5%;

for urban females the regular wage employment increased from 53% to 64% during the same period.

Table 4 : UPS Workers by Type of work (15& above) in Kerala for 2011-12 & 2017-18

Emp Status/Year	Rural Male		Rural Female		Urban Male		Urban Female		Total	
	2011- 12	2017- 18	2011- 12	2017- 18	2011- 12	2017- 18	2011- 12	2017- 18	2011- 12	2017- 18
Self-employed	37.8	40.0	29.8	25.4	36.3	40.1	28.6	20.7	35.2	36.0
Regular worker	15.9	24.9	30.1	46.6	32.2	31.7	53.5	63.8	27.9	34.5
casual worker	46.3	35.1	40.1	28.0	31.6	28.2	17.9	15.5	36.9	29.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Same as Table 1

Sectoral Shares in Employment and Output: The industrial structure of employment in Kerala displays a maturing of structural transformation in employment. The employment in the primary sector is only 18% in 2017-18, correspondingly the secondary sector share is 32 % while the tertiary sector claims 50% of all employment. However when compared to the transformation in GSDP there is still a structural lag in the employment transformation. While share of primary sector in GSDP declined from 14.4 % during 2011-12 to 9.5% in 2017-18 in employment the share remained stable at 18 % during the period. But for the tertiary sector the GSDP share increased from 57.5 to 62.1 % even when the employment share remained unchanged at 50% during the period. This implies that the relative productivity of the sectors also changes. The relative productivity of primary sector declined from already 0.72 to 0.51 while that of service sector increased from 1.1 to 1.24, pointing towards the skewed transformation of the economy. With the slow change in employment structure compared to GSDP, the gainers in the structural transformation would be limited to service sector. Unlike the theoretical models which predict rising productivity in all sectors along with the structural transformation, productivity growth in the primary sector would be limited, while there would be large productivity growth in the service sector. This would lead to rising inequality driven by inter-sectoral growth mismatches in the economy.

Table 5: Sectoral shares in employment and output.

	Share in Employment		Share in GSDP		Relative Productivity		change in employment share	change in GDP share
	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18		

Primary	18.1	18.2	14.4	9.5	0.79	0.52	0.1	-4.9
Secondary	32.6	31.9	28.2	28.4	0.86	0.89	-0.7	0.2
Tertiary	49.4	50	57.5	62.1	1.16	1.24	0.6	4.7
Total	100.1	100.1	100	100	1.00	1.00	0	0

Source: Same as Table 1

Industrial distribution of workers: In terms of industrial distribution of workers, the women workers are highly concentrated in a few sectors compared to males. In 2017-18 the top three industries accounted for 71% and 72% of the women workers in rural and urban areas respectively. For males this concentration is much lower at 63 % in rural and 56 % in urban areas. Even though the male concentration is lower than females, the top three industries share continue to remain the same during 2011-12 to 2017-18. While for females there is a decline in both rural and urban areas. Thus it can be inferred that though women's employment is highly concentrated in a few sectors this condition is slowly changing.

It is of significance to note that the shift from agriculture to other sectors had been mainly concentrated among the rural females. The share of rural females in agriculture declined from 31.4 % to 24.6 during 2011-12 to 2017-18. It is also interesting to note that share of urban workers in agriculture; both males and females had increased marginally. Thus quite contrary to expectation, while rural labour in agriculture is declining, urban labour is increasing.

A simple correlation between the industrial distribution of males and females show that the distribution is becoming increasingly unrelated to each other. From an R of 0.63 in the first period it declined to 0.54 in second period for rural areas and from 0.52 to 0.27 in the urban areas shows that males and females are increasingly engaged in unrelated fields. Though this does not indicate occupational segregation in the strict sense, it does indicate that women and men are entering different industries.

The most significant industries of employment are agriculture, construction and trade, restaurants for rural males. For rural females the prominent industries are agriculture, community and personal services. Manufacturing and agriculture declined for rural females, while trade, restaurants, & community and social services became prominent. For urban males construction, trade restaurants, and transport storage are the more dominant industries while for urban females, community , social and personal services and manufacturing are the dominant industries.

Table 6: Industrial distribution of workers in percent (UPS)

Industry/Year	Rural Male		Rural Female		Urban Male		Urban Female	
	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18
Agriculture & allied	26.8	26	31.4	24.6	7.4	10.6	6.4	7
Mining & quarrying	1	0.5	0.1	0	0.3	0.1	0.2	0

Manufacturing	10.1	9.3	20.5	12.5	14.5	12.8	22.2	16.5
Electricity, Gas & Water Supply	0.5	0.6	0	0.1	0.8	0.8	1.3	0.3
Construction	21.5	22.5	11.3	11.6	18.1	22	4.2	8.6
Trade, Rest & Hotels	15	14.1	6.2	10.7	22.8	20.9	16.6	10
Transport Storage &	12.1	12.3	0.8	1.5	12.1	13.4	2.2	2.4
Finance Insurance & Real	3.4	4.4	4.1	5.1	8.4	7.2	6.4	12.2
Community Social & Personal	9.7	10.3	25.6	33.8	15.6	12.4	40.6	43
Total	100	100	100	100	100	100	100	100
Top 3 industry share	63.3	62.6	77.5	70.9	56.5	56.3	79.4	71.7

Source: Same as Table 1

Occupational Distribution of workers: Low skilled occupations, such as elementary occupations still hold the largest share in employment in Kerala, about a fifth of the employment. However there are signs of movement towards higher skill among both males and females in both sectors. The share of males and females in both sectors in middle and high skilled occupations has increased. Most workers are in the middle level skills, while the low skilled occupations, though large is declining.

Table 7: UPS Workers classified by occupation (15& above) in Kerala for 2011-12 & 2017-18

Occupation/Year	Rural Male		Rural Female		Urban Male		Urban Female		Total	
	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18
Legislators&Managers	7.8	12.1	4.9	5.8	16.4	19.7	9.4	8.7	10.7	13.6
professionals	2.1	3.4	4.9	11.1	5.8	6.1	17.5	18.6	5.6	7.1
Tech&Assc.professiona	4.0	3.2	11.0	10.2	7.0	5.2	11.2	10.4	6.8	5.6
clerks	1.4	2.1	3.5	3.8	3.8	3.7	8.6	13.1	3.3	4.1
Service&sales workers	11.7	10.5	9.9	13.5	18.2	12.3	16.1	10.2	14.3	11.5
skilledAgri&fishery	18.4	13.6	14.0	12.2	5.1	6.7	3.5	6.6	11.3	10.2
crafts workers	23.5	23.1	17.8	11.1	20.8	22.5	13.0	7.6	20.6	19.6
plant&machine	11.0	10.8	1.0	0.8	9.0	9.3	0.7	1.0	7.8	7.9
elementary occupations	20.2	21.2	33.1	31.7	14.0	14.6	20.1	23.8	19.6	20.5
Total	7.8	12.1	4.9	5.8	16.4	19.7	9.4	8.7	10.7	13.6

Source : Same as table 1

The Labour force participation rates (LFPR) of the working age population in Kerala (age group of 15 and above) had declined between 2011-12 and 2017-18. For the first time Kerala has a majority of the working age population not in the labour force .The LFPR was only 46.47 percent in 2017-18 as compared to 52.57 percent in 2011-12, using the UPSS criteria. This trend in the fall in LFPR is visible across all reference categories, UPS, CWS and CDS. This implies that irrespective of the reference periods, there has been a decline in LFPR in Kerala during the period. But a comparison of the UPSS and UPS criteria shows that while the difference between the two in 2011-12 was by 3.89 percent, this difference between UPSS and UPS has declined to just 1.67 percent. This meant that the share of

subsidiary workers is declining in the labour market. Comparing between CWS and CDS it can be seen that the difference between the two stood at 3.31 percent in 2011-12 which declined to 1.18 percent in 2017-18. This again indicates that the share of part-time workers or those workers who spend only partial time in the labour market are declining. The two trends, declining aggregate LFPR and declining subsidiary and part-time workers is indicative of a thickening of the labour market and clearer delineation of the market. The declining LFPR across reference periods shows non-participation in labour market, most probably due to two factors increasing education among the college going persons above the age group 15 and also the retirement of the persons in the older age group, and withdrawal of working age women from labour market. At the same time, the trends also point towards greater regular participation in the labour market, while secondary workers are disappearing. Secondary workers are those who engage on a partial time basis, either through the year (such as seasonal workers) or part-time workers (such as those engage for part time in the labour market). Overall the trend shows that though overall participation is decreasing, those who remain in the market are increasingly those who spend full time.

Comparing between gender there still exists huge gender gap in LFPR. The rural male LFPR was 71 percent in 2017-18 while for females it was only 25.9 percent. In the urban areas the corresponding for males and females were 68.9 and 27.2 percent respectively. Across all groups LFPR fell between the two periods, except for urban females which stood at 27 percent in 2017-18. Comparing between sectors, it is well known that it is usually the rural women who has the highest share of subsidiary or secondary forms of employment, mostly in the agriculture sector. From below table (1) it can be seen that in rural areas the subsidiary forms of employment has declined for both males and females. Same is the case in the urban areas as well.

Table 8: LFPR (in %) for persons aged 15 & above in Kerala for 2011-12 & 2017-18.

	Rural Male		Rural Female		Urban Male		Urban female		Total	
	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18	2011-12	2017-18
UPSS	77.3	71.1	33.4	25.9	75.1	68.9	28.0	27.3	52.6	46.5
UPS	74.9	70.3	26.9	23.6	74.0	67.9	25.1	24.9	48.7	44.8
CWS	74.3	69.6	29.3	24.2	73.0	67.4	25.7	25.3	49.4	44.8
CDS	69.7	68.0	25.9	22.7	70.0	65.8	24.0	24.0	46.1	43.6

Source: National Sample Survey on Employment and Unemployment, 2011-12 and Periodic Labour Force Survey, 2017-18

The patterns in male LFPR across age groups reflects a maturing labour market among males. By maturing labour market it is meant that the participation of very young members and older members

decline while the peak working age participation increases. In Kerala's case it can be seen that for the rural and urban males the LFPR in the age group 30-44 is almost complete, nearing 100 percent. Moreover, in both these groups, the participation is either stable or rising. In the age group 45-59 also the LFPR is nearly 90 percent for the males and more or less stable. But for the younger age group, 15-29 the male rural LFPR is lower at 61 percent in 2011-12 and it fell to 55 percent by 2017-18. For the older age group also the participation was lower at 45 percent and fell to 36 percent by 2017-18. A similar decline is visible in the urban areas among both the age groups.

For females, LFPR had fallen but it is interesting to note that the largest decline was for the women in 60 and above group in the rural areas. In all other age groups there was only a marginal decline between the two periods in the rural areas. This is much in variation from the earlier visible trend of female participation declining. Yes, Female LFPR has fallen in the rural areas in 2017-18, but this is mainly in the group that may want to remain outside the labour market. In fact the indication that we get from the urban areas is that the rise is some marginal increase in LFPR across age group. So, for now there seem to be some arrest in the fall in female LFPR in Kerala, and it is to be seen whether this is sustainable to the future.

Wages in Kerala

Kerala has been a high-wage economy. Studies have noted that Kerala has one of the highest levels of wages for casual male and female workers, whether in the rural or urban areas (Papola and Kannan, 2017; Abraham, 2007). This is observable from the fact that the average Kerala wages/earnings for any segment of worker is higher than the all India average (Table 9). However, the wages for casual workers in Kerala are the highest in the country, this is not the case when it comes to regular wage employment. Regular wage workers per day earning were lesser than that of casual wage workers for rural males, which has the highest share of workers. But for females the regular wage earning was higher than that of casual wage employment. Casual and regular wage employment provided higher wages than self employment earnings for the workers in general. However we can see that the self employment earnings of the rural males at the all India level is higher than the casual wage earnings, hence the persistence of self employment in the economy. But in case of Kerala self employment earnings are lower than casual wage employment; hence the share of self employed in rural areas is declining and low in Kerala. Higher wages than self employment earnings thus seems to drive the shift of workers from self employed to wage employed in Kerala. The lack of such movement at the All India level also may be explained in the same manner.

Table 9: Average daily wages and earnings of workers in Kerala and India -2018-19

		Rural			Urban			All		
		Male	Female	Persons	Male	Female	Persons	Male	Female	Persons
Regular wage labour	Kerala	658	398	572	744	581	678	703	508	631
	India	460	286	422	652	522	622	572	428	540
Casual wage labour	Kerala	732	388	697	680	372	648	711	382	677
	India	297	199	279	368	244	352	310	204	291
Self employed	Kerala	444	135	392	514	207	459	473	166	420
	India	320	145	297	552	228	506	376	167	348

Source : PLFS 2018-19

The high level of wages can also be gauged from the data relating to the average daily wages of carpenters and masons, which has registered a nearly fourfold increase from 2004 to 2016. Similarly, in the case of unskilled agricultural workers, the daily wages for male and female workers have registered a threefold increase from 2004 to 2014. However, it is important to note that the gender wage differential has widened significantly.

Formal and Informal Labour: Kerala continues to have an overwhelming presence of informal labour. Informality is defined in terms of the NCEUS definition of informal worker. Based on the definition the share of informal workers among rural males in the 2017-18 in Kerala was 87%, which declined from 93 percent in 2011-12. The share of informal workers in the Kerala economy both for rural and urban areas and for males and females have declined compared to the earlier levels in 2017-18. This is consistent with the observation made earlier that more workers are entering the wage labour market and more of them are becoming regular wage workers. However, this does not imply that the Kerala economy is moving fast towards formal work. As shown in the previous table, regular wage work, though gives job security is now losing out on income security. So, formal worker does not imply that the worker now enjoys securities of income, job and conditions of work. Therefore the role of the state in addressing informality is becoming all the more important despite the shift towards formality in the economy.

Table 10: Share of formal/informal workers in Kerala

Share of formal/informal workers in Kerala				
	Informal workers			
	Rural		Urban	
	2011-12	2017-18	2011-12	2017-18
Male	93.15	86.90	85.26	84.61

Female	89.33	78.43	78.30	65.14
	Formal workers			
	Rural		Urban	
	2011-12	2017-18	2011-12	2017-18
Male	6.85	13.10	14.74	15.39
Female	10.67	21.57	21.70	34.86

Source : Same as table 1

A large share of the informal workers remain so because they work in firms that are small and hence are not part of the organised sector. The share of employment in the organised sector, defined in terms of the Factories Act and the Shops and Establishments Act, had been declining till 2011-12. However, since 2011-12 there has been a turnaround with the share of organised sector employment increasing in both rural and urban areas across both males and females. However, notably it is the female employment that has gained massively during this period with increase in both rural and urban areas.

Table 11: Share of org/unorganised workers in Kerala (15+)

Share of org/unorg workers in Kerala (15+)				
	Unorganised sector			
	Rural		Urban	
	2011-12	2017-18	2011-12	2017-18
Male	82.60	74.50	73.93	72.56
Female	63.45	49.98	62.82	46.55
	Organised sector			
	Rural		Urban	
	2011-12	2017-18	2011-12	2017-18
Male	17.40	25.50	26.07	27.44
Female	36.55	50.02	37.18	53.45

Source : Same as table 1

The employment in the organised sector in Kerala is driven in equal measure by the public and private sectors. About half the organised sector employment is in the government sector. However, as per the Economic Review of Kerala (2017) the total organised sector employment declined from 12.26 lakhs in 2000 to 11.85 lakhs in 2016. The decline, however is largely due to the public sector employment, while there is a rise in private sector employment. This is reflective of the larger national narrative of privatisation.

The decline in public sector employment is part of a larger phenomenon at the national level. Fiscal disciplining imposed on the state governments through the Fiscal Responsibilities and Budget Maintenance Act 2003 (FRBM Act 2003) has reduced the fiscal space for all the states. This apart, many of the public sector firms, both of the central government and state governments, are becoming unsustainable. In Kerala labour struggles in the early years had been instrumental in seizing rights for workers. However, in the later years, labour militancy led many private firms to lockout and many public sector firms to shut down owing to long-term labour struggles. In this context it is interesting to note that the share of women in the private sector has been rising. For males also the share had been rising, but the rise has been more substantial in case of women..

CHAPTER 8.2

CREATING NEW EMPLOYMENT OPPORTUNITIES

The table below shows the GSDP growth in Kerala during the period 1999-2000 to 2018-19. Labour demand is derived demand, therefore the future prospects of employment are best judged by the structure and growth of output in the economy. There are two accounting factors associated with growth of output, that affects employment, one is the direction of employment growth with output; and other is the magnitude.

Agriculture sector had been the main source of employment for an agrarian kerala economy. Kerala, has moved away from its agrarian roots and is a service sector oriented economy. The performance of agriculture sector in GSDP growth shows that during the most part of the period 1999-2000 to 2018-19 it had negative growth. We must remember that this is not part of the structural transformation. Structural transformation only accounts of relative shares, but does not indicate negative growth in any sector. Here, we see the agriculture sector is shrinking. There could be many reasons on this. In terms of future employment, this would mean agriculture sector is not going to act as an absorber of surplus labour in the economy. This has serious implications in terms of the need for institutional safeguards against vulnerabilities. Agriculture, as is well known, is also the sector with the largest labour intensity in the economy. So in order for other sectors to absorb the labour that is released from the negative growing agriculture sector , these sectors would have to grow at positive rates higher than the compensatory growth required to match GSDP growth in agriculture. But mere compensatory growth of other sectors is not enough to absorb this labour pushed out from agriculture. These workers would require newer skills to move to other sectors.

Mining and Quarrying has had fairly high output growth generally, but in the last period 2014-15 to 2015-19 the growth rates had been negative. Mining and Quarrying, resource extractive industries is being discouraged in any parts of the world due to the environmental consequences of these industries. Kerala is no different. Rich in different minerals, mining had been rampantly practiced across the state. This led to many environmental issues on the sector. Though the sector is active currently, its future in a shared and sustainable growth path is bleak. Therefore, employment in this sector would also may not have much growth.

Manufacturing sector has shown sustained growth in Kerala since 1999-00. Manufacturing sector growth had been of limited success till the early 2000s. Thereafter the growth in this sector has picked and currently one of the fastest growing sector in Kerala during 2014-15 to 2018-19. Construction sector on the other hand, which had high growth rates in the early 2000s, is slowing down during the period. Another sector that is slowing down is the transport, storage and communication sectors. Sectors such as

Trade, Hotels and Restaurants; Banking and Insurance; Real Estate; Ownership of Dwellings and Business Services show promise of sustained growth in future based on the growth trends now.

The sectors that show growth dynamism in the recent past are mostly service sector, and manufacturing sector. These sectors demand labour that are skilled. Unlike agriculture sector and construction sector which were traditional employment absorbing sectors and required a large share of unskilled labour, the emerging sector depend on technical, professional and general skills. Therefore, looking at the potential demand for output in future, it seems that skilled labour in greater supplies would be in demand in Kerala.

To some extent the labour supply matches the type of labour demand. Kerala, through its strong public policies had been able to develop a workforce that is reasonably educated. The trends in output show that there is need for greater presence of educated and skilled labour. The current supply of labour is moving towards this direction.

Table 12: Labour productivity, its growth and employment elasticity

	labour productivity per annum in Rs		labour productivity growth per annum(%)	employment elasticity of output for 2011-12 to 2017-18
Year	2011-2012	2017-2018	2011-12 to 2017-18	2011-12 to 2017-18
Agriculture and Allied Activities	184500	207043	2.3	2.1
Mining and Quarrying	406691	1096854	21.9	-4.6
Manufacturing	189077	460577	19.5	-0.4
Construction	256463	304115	3.5	0.1
Electricity, Gas and Water supply	668426	888358	5.9	-1.3
Transport Storage and Communication	251390	331043	5.7	-0.1
Trade, Hotels and Restaurants	267691	488742	12.8	-0.3
Banking and Insurance	498553	654817	5.6	0.3
Real Estate, Ownership of Dwellings and Business Services	997860	1732076	11.7	0.0
Public Administration	471900	715427	8.7	-5.0
Other Services	220651	336361	8.8	-0.1
Total	267281	420221	9.5	-0.3

Source: Same as Table 1 and Table 18

From Table 12 it is visible that the simple measure of labour productivity, GSVA/number of employees, had increased at a healthy rate of 9.5 percent per annum during this period, 2011-12 to 2017-18. The productivity growth was highest in mining and quarrying, followed by manufacturing sector. However productivity growth in the agriculture sector was only 2.3 percent and construction only 3.5 %. We had seen earlier that these two sectors growth in GVA was declining for the last two decades. The decline in GVA is reflected on the productivity growth of these sectors as well. However these are the only two sectors that had positive employment elasticity during this period. The positive employment elasticity in agriculture is but due to negative growth in both employment and output. All other sectors had positive growth in output but a fall in employment. It was this fall in employment that led to a rise in productivity growth.

Is the productivity rise associated with better human capital? There seems to be some evidence to show that the level of education of workers in most sectors have increased, except for agriculture. In agriculture the share of workers with primary or less education increased by 4.9% during 2011-12 to 2017-18, workers with higher secondary increased by 1.03 while graduates/diploma increased by 0.1 %. The case of manufacturing is typical skill biased demand. The manufacturing sector had recorded highest growth in GVA during this period. However, employment share of workers with school or no education declined by 9.1 % while diploma/graduates increased by 1.09. This suggests rising demand for higher educated workers in the sector. In construction sector we find a rise in demand for all categories of workers, while in services of trade, restaurant; transport& storage ;finance and real estate there is a decline in graduate and above employment, while it increased for school or higher secondary educated workers. Clearly, the addition to labour in the two sectors agriculture and construction are mostly for less educated, while it is the higher secondary educated that are entering into the services sector. For the graduate and diploma holders manufacturing sector and community& personal services are attractive. So, in short it can be seen that the sector with highest productivity growth, manufacturing could increase its productivity by improving human capital within the sector even though employment share declined. Similarly high productivity growing services sector saw increase in higher secondary educated workers, while low productivity growth sectors agriculture and construction saw the increasing presence of least educated. This the change in the educational composition of workers in the sectors seems to suggest that the overall productivity growth in the economy was indeed driven by two factors, changes in sectorial growth and increasing skill component in high productivity sectors.

Thus the indication from the analysis above shows that education and skills play a very important role in the productivity growth in the economy. However, it also shows that as per the current patterns high levels of education do not seem to attract workers to most sectors. Diploma and Degree holders were increasingly preferred only in two sectors, manufacturing and community and personal services. This implies the current composition of growth will not be able to attract highly educated workers for

employment, while the preferred education level that seems to be attractive is the higher secondary level of education, being absorbed mostly in the service sector.

Employment is the primary source of livelihood for most persons, who does not have past savings to fall back on. Hence, the need to prioritise employment generation in a development state. The extent, nature and composition of employment are inextricably linked to the output market, the substitutes of labour and the institutions that support labour. Therefore a vision for an economy is a vision for its working class. What is the future that Kerala envisages for itself? Development in Sen's sense envisions an economy that enhances capabilities of individuals and groups such that they see their opportunities and have the agency to act upon to realise these opportunities. Development must also Just, in the rawlsian sense, such that the maximum gains are made to the most deprived in the society. Development in this sense also must protect the future generations from being deprived of their rightful place to live. Thus a development vision would encompass a economy that is economically growing, which is ecologically sustainable and socially equitable.

Given such a vision for Kerala a livelihood centric growth strategy that is also sustainable could help in achieving this vision. A livelihood centric growth must aim to increase labour absorption, both that of wage workers and self employed. The focus must be on production process that depends on skills and human capital, which is bolstered by physical capital and technology. An ecologically sustainable growth strategy would aim to utilise locally available natural resources within the framework of reuse, recycling and use only to sustainable limits. Such a growth vision would imply that growth of value addition is counted in terms of ecological evaluation as well. It is possible that such a growth is also judicious, by including the marginalised using technology to the advantage. In fact Kerala can be developed as a network of small sized, high technology producers of services connected to the global market producing at the high end of the global value chain. Education and skills forms the basis of such a society.

As part of the 100days programme announced by the government of Kerala, it is expected that more than 12,377 candidates will be benefited by the Employment Exchanges through Self-employment Assistance and placement against various vacancies that may be reported to Employment Exchanges.

CHAPTER 8.3

GENDER AND EMPLOYMENT

The structure of the labour force and its pattern depends very much on the growth trajectory of the economy and its historical specificities. Kerala's economy has experienced vast changes since the mid-1960s. From being predominantly a rural agrarian economy (but distinct due to a low share of agriculture) growing at low rates, with high social development, it has remarkably transformed into a high growth service oriented economy since the early 1990s, moving forward onto a path of industrialisation. This can be seen from the changes in the industrial distribution of the state domestic product. The tertiary sector contributes about 63 percent of the State GDP, the primary sector 13 percent, and manufacturing and construction 24 percent. From being a low income state during its status as an agrarian economy it has also become one of the high ranking states in terms of per capita income and expenditure.

One of the most profound effects of these economy wide changes has been on the labour market within the economy. The structure of both the supply and demand for labour has witnessed significant changes (Vinoj Abraham 2017). The supply side is affected mainly by the changes in demographic structure and levels of human development, in particular education, while the demand side is affected by the acceleration in growth, high per capita income and its structural shift to a service oriented economy.

Earlier studies on Kerala's labour market had shown that the gains made through social and human development, political empowerment and institutional reforms had successfully enhanced wages in the state, while their ability to tackle unemployment had been mediocre. In fact, high rates of unemployment, especially unemployment among the educated, does indicate a mismatch between the type of growth that has occurred in the state and the human resources produced in the economy. That the above is mediated by gender has to be kept in mind -- hierarchies emerging from the socially ascribed gender division of labour (man the bread winner and woman the home maker) are effectively played out in the labour market where informal activities are highly gendered spaces.

Women workers are over-represented in the lower segment of the 'informal employment' pyramid – as temporary or part-time workers, contract workers, unregistered or undeclared workers and home-based supply chain workers that is, employment without secure contracts, worker benefits, or social protection who are not even captured in workforce estimates and hence grossly underestimated in the Labour Force Surveys in the economy.

Despite their location at the bottom, a unique feature of the labour market in Kerala is the early unionisation of workers in its unorganised sectors, including the major traditional industry of coir and subsequently other traditional sectors like cashew and agriculture in which the proportion of women workers is overwhelmingly high. Hence the average wage rate for a woman worker in the state, though lower than the male wage has been above the all-India wage. The existence of Welfare Fund Boards (another unique feature of the labour market in Kerala) ensures some social security benefits to those workers registered with the Boards. However,

globalization and the pressure for ‘flexible’ labour and a cheapening of the wage through sub-contracting appears to be on the rise with very low daily/piece rated wage rates being paid to women workers, largely based in their homes.

Kerala’s labour market, in particular the female labour market, against the changing development scenario needs to be understood through changes in the workforce participation and the nature and type of work that has occurred in the economy as reflected in the recent PLFS data.. Most of the data on labour force/workforce and related aggregates are provided in the chapter on Kerala’s Labour Force and Development. We focus here on some interesting aspects of the female work force participation, educational levels of workers, unemployment and status of workers.

Work Force Participation Rates in Kerala

While HDI and GDI ranked Kerala first in the National HDI Reports, the high values for health and education in fact concealed the fact that in terms of the third component, namely work and earnings, Kerala lagged far behind in the initial years. High rates of literacy and impressive levels of female education did not translate into growth of paid employment for women nor into upward occupational mobility. Despite the fact that young women surpass men in educational attainment except in technical/engineering fields (51 percent are girls at Higher Secondary stage; 68 percent at graduation level in Arts and Sciences colleges and 66 percent at post-graduation level, but only 41 percent in technical/engineering level), making available such an incredible talent pool and national resource of young women, their presence in paid employment is very low. The flip side is that in a literate state too, about 45.5 per cent of women in rural areas and 47 per cent in urban areas are primarily engaged in domestic work (data for 2011-12) but also participate in certain specified activities (which are partly economic) (Table1).

Table 1: *Percentage of females (of age 5 years and above usually engaged in domestic duties in the usual principal status) who carried out specified activities -All India*

S No.	Activity	All India Rural	All India Urban	Kerala Rural	Kerala Urban
		2011-12	2011-12	2011-12	2011-12
1	Maintenance of kitchen garden	23.3	7.8	16.5	11.3
2	Maintenance of animal resources	21.5	2.4	14.2	5.3
3	Free collection of fuel/cattle feed	43.5	5.3	16.5	3.6
4	Preparation of cowdung cake	40.9	4.6	0.7	0.1
4	Fetching water from outside	30.6	9.6	7.7	6.0
5	Sewing/tailoring etc	27.3	23.5	10.0	11.7
6	Tutoring own children or other children for free	6.8	12.0	12.2	13.7

Source: NSSO 68th Round: Participation of Women in Certain Specified Activities along with their Household Duties, Report No.559.

Women are engaged in economic activities like kitchen gardening, animal resources, sewing and tailoring, but not considered part of labour force, and hence women workers get grossly underestimated in the official data. Another interesting aspect of the Table is that a much smaller proportion of women in Kerala are engaged in collecting fuel, water, fodder or making cow dung cakes, that is, shoulder a much lower burden of the most onerous and time-consuming tasks for women, since such services on average are more widely available. Yet work participation rates are low. Of course, it is also possible that activities like child/elderly care, which are not captured here could pose a major constraint on women coming out of the household for work.

Workforce participation rates in the state had been lower than all India, particularly in rural areas. However, Kerala has always had one of the highest (among states) rates of female labour force participation in urban areas which needs to be highlighted since it does reflect some benefits of higher literacy levels in Kerala. Over the years with a faster decline in workforce participation rates for all-India, Kerala did catch up and in 2011-12 with a slight increase in the rural WPR and no change in the urban WPR (68th NSSO survey); in 2017-18 female WPRs for the state and India were almost same 16.4 percent for Kerala and 16.5 percent for India. *In 2018-19, there was a significant increase in female WPR to 20.4 percent (-- in rural and --- in urban areas)(FILL THE GAP) while the increase in female WPR was lower for India, 16.5 percent to 17.6 percent.* Female WPR is higher than 18 percent which the LDF Election manifesto had promised to bring about during its term.

Educational Level of Women Workers

While high levels of female literacy did not result in high levels of paid employment for women in Kerala, those employed have a higher level of education than all-India (2017-18), even in rural areas. Another fact that emerges is that the probability of getting a job is higher, as reflected in the proportion of workers who have graduated and above. Also, some skilling in terms of a diploma has even a higher chance of getting employment -- 44 percent of the women with diploma are employed in rural areas; however, in urban Kerala, graduate and above show a higher WPR.

Table 2: *WPR in Kerala and India according to education levels (UPSS) (Age 15 plus)*

	Kerala	India		Kerala	India
	Rural female	Rural female		Urban female	Urban female
	2017-18	2017-18		2017-18	2017-18
Below primary & primary	18.31	26.2		18.68	21.93
Middle	21.75	18.35		18.97	13.77

Secondary	17.56	15.6		13.71	10.59
Higher Sec	11.5	12.54		10.71	9.85
diploma	44.5	34.92		30.24	32.84
Graduate_and_above	29.4	20.93		34.44	26.66

Source: PLFS, 2017-18

Industrial Distribution of Workers

That Kerala has a much more diversified pattern of female employment even in rural areas comes out very sharply from Table 3. As an earlier study showed the shift of the female workforce away from agriculture was quite marked in Kerala between 2004-05 and 2011-12.

Table 3: *Industry-wise profile of workforce (all ages) by UPSS:2017-18*

	Kerala				India			
	Overall female	Rural female	Urban female		Overall female	Rural female	Urban female	
Agriculture & Allied	19.04	26.09	9.64		56.99	73.19	9.07	
Mining & Quarrying	0	0	0		0.17	0.17	0.15	
Manufacturing	14.04	13.08	15.32		12.57	8.16	25.61	
Electricity, Water, etc	0.15	0.1	0.22		0.07	0.01	0.23	
Construction	11.42	12.96	9.35		5.03	5.34	4.12	
Trade, Hotel, Restaurant	9.28	9.76	8.63		5.03	3.17	10.55	
Transport, Storage & Communication	1.67	1.36	2.07		0.45	0.19	1.23	
Finance and business	9.93	5.88	15.33		2.38	0.54	7.82	
Community social & personal	34.48	30.77	39.43		17.31	9.23	41.22	

services								
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Source: PLFS 2017-18

Despite the sharp fall in female employment in agriculture during that period, female participation rate in rural Kerala did not decline as much as it did in rest of India because of a sizable increase in employment opportunities in construction and services sector for rural women. This helped in some levelling of WPRs in Kerala with India (pointed out earlier). In fact a remarkable feature of the female workforce in Kerala is the high share in it of a select number of service sector activities in which wages per worker would be higher and require skilled and educated workers (Jayan Jose 2018). The proportion of women employed in public administration, education, health, information services (all part of community, social and personal services), finance and business, reveal very high shares of women workers, almost double of India's even in rural areas and higher than other states such as Gujarat or Karnataka (Jayan Jose op cit).

Unemployment

The open unemployment rate is much higher for women in Kerala, and while it increased in 2017-18 to 23.2 (the year for which it increased very sharply for India too), it declined in the next year to 17 percent, while it declined marginally to 5.1 percent from 5.7 percent for India as a whole. Unemployment and educated unemployment rates for females are higher in rural areas. Age-wise the problem is even more acute for women; not only is the incidence of unemployment higher for females at entry level, it does not decline as sharply by age as for men: even at age 25-29 almost half the educated women are seeking employment (data for 2011-12). While almost half the women in rural areas with a graduate or above degree are unemployed, among diploma holders it is much lower. However, in urban areas it is high for all women who have higher education. (Table 4).

Table 4: *Unemployment in Kerala and India according to Education Levels (UPSS) Age (15 plus)*

	Kerala	India		Kerala	India
	Rural female	Rural female		Urban female	Urban female
	2017-18	2017-18		2017-18	2017-18
Below primary & primary	0.43	0.66		2.61	1.27
Middle	4.99	3.66		5.40	5.15
Secondary	10.17	4.39		31.85	10.57

Higher Sec	45.75	14.36		47.78	17.19
diploma	16.18	25.4		42.02	23.86
Graduate_and_above	45.21	33.89		37.51	22.54

Source: PLFS 2017-18

Since open unemployment is much lower in India, it is manifested only in the higher education levels, especially in rural India. Opportunities of non-agricultural employment appear to be much lower. By juxtaposing worker participation rates and of the unemployed by education levels it appears that though the probability of getting employed increases with higher education, young women still pursue graduate and above despite a longer waiting period for getting employed.

Status of Workers

Keeping aside for the moment the fact that a WPR of 20 percent achieved in 2018-19 is still ridiculously low given the potential that exists, we attempt to understand the nature of this increase by looking at the changes in the status of industrial distribution of the workforce in Kerala during 2017-18 and 2018-19.

As pointed out earlier, women workers are grossly underestimated in Kerala, but those working appear to be better off than their counterparts in rest of India since proportion of regular workers is much higher in Kerala: 50 percent of women workers were regular workers in 2017-18 (41.3 in rural and 55.8 in urban areas). For India the figures were 22.6 percent (10.5 percent in rural and 52.1 percent in urban areas). However, the picture changes in 2018-19. There is a sharp decline in female regular workers in Kerala to 42 percent (33.6 percent in rural and 53.2 percent in urban areas). The increase in Kerala was taken up by self-employment and a larger proportionate increase in casual labour; especially in rural areas. The increase at the All India level is taken up largely by self-employment with a decline in percentage of women casual workers. One has to investigate where the decline in regular work occurred; the increase in casual labour and self-employment could certainly be due to the special emphasis on NREGA and AUEGS, and self-employment promoted through micro-enterprises. We give some information on the concerted attempt to provide remunerative work to women in the post-2018 flood recovery phase and which has continued since then.

That this increase took place in a flood-hit year is even more noteworthy and a possible fallout of the large allocations made to increase the reach and number of days of NREGA, and the stimulus given to Kudumbashree to increase its micro-enterprise activity in the post-flood recovery.

Mahatma Gandhi National Rural Employment Guarantee Scheme (NREGA)

In Kerala over 90 percent of the workers in NREGA are women. The spike in person days of employment generated in 2018-19 needs to be noted (see Table 5); notified unskilled wage rate for this programme in 2017-18 was Rs.258/- per day and was enhanced to Rs.271/- from 1st April 2018 onwards. In the context of the Covid-19 Pandemic, the unskilled wage rate has been increased to Rs.291/- for the state. The government also initiated the process of geo-tagging all Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) assets, thereby enabling greater transparency and better real-time identification.

Table 5: *Status of employment provided in Kerala from 2016-17 to 2020-21*

Year	No. of Active Job Cards (No. in Lakh)	No. of households got Job (No.in Lakh)	% of household got Job	Person days generated (No.in Lakh)	Average days of emp provided to a household	No. of Families completed 100 days	% of household completed 100 days against total hh Employed
2016-17	20.31	14.52	71.49	684.62	46.97	1,13,186	7.76%
2017-18	19.39	13.04	67.25	619.59	47.24	1,17,370	8.94%
2018-19	20.20	14.78	73.19	975.25	65.97	4,41,480	29.80%
2019-20	20.00	14.38	71.95	801.89	55.73	2,50,584	17.42%
2020-21(as on 21.08.2020)	19.09	11.19	58.64	272.17	24.31		

Source: NREGA data base

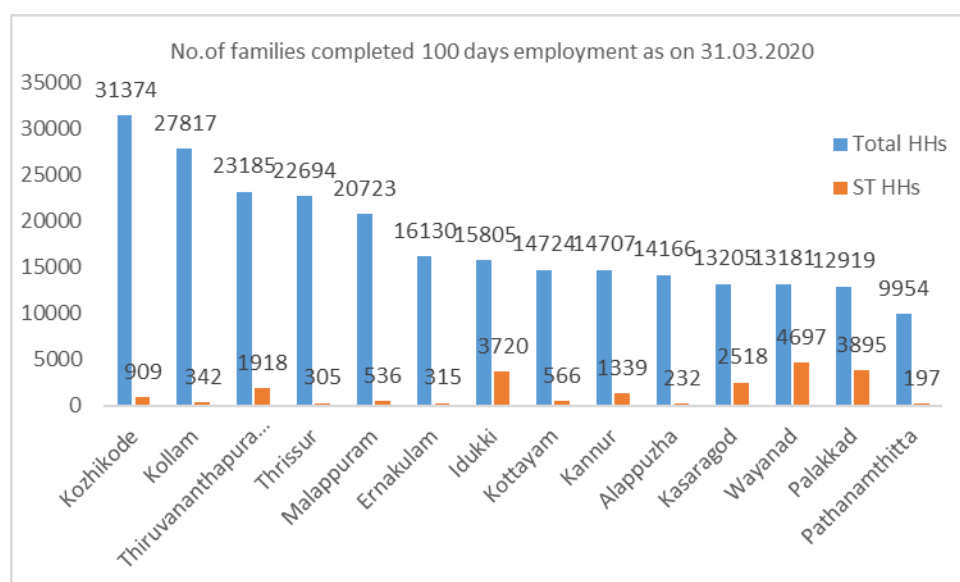
Special Initiatives Undertaken in the aftermath of the Flood-2018

In the post-flood restoration efforts undertaken in the State, MGNREGS played a crucial role in rebuilding Kerala through renovation of the public assets and livelihood regeneration of vulnerable sections of the society. The Government of India originally sanctioned to generate 5.5 crore person days in 2018-19. In order to overcome the flood situation, as per the request of the State Government, GoI sanctioned to generate 7 crore person days under MGNREGS. At the end of the financial year 2018-19, 9.75 crore person days was ensured. Initially, the State had got sanction for an additional 50 days of employment per household in seven heavily flood affected districts. Subsequently, an additional employment of 50 days has also been given in flood-affected regions for 87 Grama Panchayats in six partially flood affected Districts. In 2018-19, after the flood (from August 16, 2018 to March 31, 2019), employment has been provided to 12.02 lakh individuals from 10.31 lakh families, of which 6.12 lakh individuals from 4.83 lakh families were newly employed. After the flood, new job cards were issued to 82,605 families. As

a result of providing 7.63 crore person days, Rs. 2068.74 crore worth of employment (i.e. Rs. 271 wage per day) was generated.

The flexible nature of MGNREGS makes it a scheme widely suitable for convergence with other schemes. Both the manpower and material component provided by the scheme can be utilised to complement other schemes to hasten the development potential of all types of projects. At the same time, this also addresses the problem of finding productive and asset creation works for MGNREGS beneficiaries. Keeping the above in mind, extensive plans have been formulated to bring in line other departments into the planning process of MGNREGS. The scheme has been converged with LIFE Mission also to ensure maximum employment.

The scheme is also a part of the “Subhikshakeralam” programme and has been contributing to the preparation of the soil, construction of cattle sheds and poultry sheds, renovation of ponds and water bodies, and rainwater harvesting activities.



Ayyankali Urban Employment Creation Scheme (AUECS)

The State Government had launched the Ayyankali Urban Employment Guarantee Scheme on the pattern of MGNREGS during 2009-10. The Scheme is intended to enhance livelihood security in urban areas by providing at least 100 days of wage employment to every household whose adult members are willing to do unskilled manual labour. Creation of durable community assets and strengthening the livelihood resource base of the urban poor is also envisaged under the scheme. The scheme mandates at least 50% of the beneficiaries shall be women who have registered and demanded for work under the scheme.

Cleaning of drainage and streets on a regular basis is included to provide more work days to the beneficiaries. Further, the devastating flood has affected many urban Local Governments and thousands among the urban population lost their livelihood. Thus, priority was given to the flood- affected Urban Local Governments (ULGs) for enhancing the average person days of

employment of the affected people. Convergence of PMAY-LIFE with Ayyankali Urban Employment Creation scheme has been ensured to create additional workdays. In order to provide maximum workdays and ensure smooth implementation of the scheme, essential tools and small machines required for the labour work are also provided under this scheme. Dairy farming has also been introduced under the scheme. Dairy farmers who have more than two cattle can be given employment and wage through the scheme as per the norms.

In 2016-17, 5.06 lakh person days were generated. In the financial year 2017-18, 8,46,432 person days were created. During this period, 28,797 households and 36,288 women were provided employment, and 251 families completed 100 days of employment. During 2018-19, 16,68,195 person days in various Municipalities and Corporations was created, 85,943 households and 80,735 women were provided employment, and 1,225 families completed 100 days employment.

Kudumbashree. During the year 2015-16, 39.87 lakh families were covered under 2.58 lakh of NHGs. As of now, Kudumbashree has a participation of 44.91 lakh women and 2,99,297 NHGs.

- *Resurgent Kerala Loan Scheme (RKLS).* Government of Kerala introduced the 'Resurgent Kerala Loan (RKL) Scheme', with an aim of providing interest free loan up to ₹1.00 lakh per household (female-headed) to the flood-affected Kudumbashree members who were the beneficiaries of the immediate flood relief of ₹10,000 by the State Government. The interest of the loan at 9 per cent was borne by the Government. Up to August 2019, interest-free loans of ₹1,680.13 crore was provided to 1.95 lakh people through 28,212 NHGs.
- *Chief Minister's Helping Hand Loan Scheme ('Sahayahastham').* (Rs.2000 crore loan)- So far 2,05,000 number of NHGs and 2300 lakh members got the benefit of this interest-free loan scheme announced by the Government of Kerala in the wake of the Pandemic.

Micro Enterprises (ME)

- As of now, the total number of ME Units comes to around 26,448.
- *Coir Defibring Units:* In order to revive our traditional coir industry, five Kudumbashree coir defibring units were started at Kannur (2), Calicut, Kasargod and Thrissur. Work is progressing for three more units in Kottayam, and Trivandrum.
- *Formation of 14 Common Facility Centers* in Parasala, Punnalur and Padinjarathara.
- *Haritha Karma Sena:-* Till March 2019, 27,988 Kudumbashree women from 888 LSGIs got first-level training in waste management through Kudumbashree and Harithakerala Mission with the fund assistance from KILA(2.5 Crore). As per the latest data, Haritha Karma Sena units have been formed in 1033 LSGIs.
- *Schedule Caste Department, Gavi Livelihood Project:* A comprehensive tourism-oriented livelihood programme for SC beneficiaries to establish five mini café units on the way from Pathanamthitta to Gavi, and two tourist bus services to capture the tourism potential of Gavi.

- *Construction Labour.* In order avail of the opportunities in the construction sector, Kudumbashree members who are interested in construction activities were identified, trained and registered in respective Local Governments and will be entrusted with construction projects of LGs. In 2019-20, 318 constructions groups (251 rural units and 67 urban units), with 2,347 members were formed across the State and have been employed in constructing 269 houses in convergence with various Departments like LIFE Mission and PMAY in the Scheduled Tribes Development Department .
- *ARISE Skill Campaign.* As part of post-flood activity for resurgent Kerala, Kudumbashree has started a skill campaign viz; ARISE (Acquiring Resilience and Identity through Sustainable Employment) to provide skill training to 50,000 candidates in 10 selected areas. The ten fields are housekeeping, house maid, plumbing, electronic repair, electrical work, day care, agriculture labour, sales, data entry and laundry and ironing. As an after-flood intervention, ARISE technicians repaired 360 houses in August 2019. As on 2020, around 14,049 candidates were trained and 4883 candidates were positioned.
- *Joint Liability Groups (JLGs).* Kudumbashree Interest subsidy and area incentive to Joint Liability Groups (JLGs), and subsidies to various Agro-based enterprises (medium & small scale value-addition units and agri-business ventures) have been started. The number increased to 71,572 Joint Liability Groups as on 01-09-220 (with 3.54 lakh Kudumbashree members) cultivating in an area of approximately 50,000 ha, under lease land collective farming.
- *Kerala Chicken – Broiler Farms.* The main objective of Kerala Chicken project is to ensure safe and clean birds to consumers at reasonable prices, and to provide a steady income for its members. This will also provide a steady and non-fluctuating market price for broiler chicken. Kudumbashree Broiler Farmer's Producer Company Ltd (KBFPCL) has started four outlets in Ernakulam District and two in Thrissur District. In the Kerala Chicken project, Kudumbashree is going to establish 100 sales outlets in the state. In October 2020, 10 outlets will be started as part of Government's 100 days programme.
- *Aadugramam.* Value Chain Programme - The Aadugraamam project is a goat-rearing support initiative to provide a regular source of income to Kudumbashree members that is envisaged to establish 14 Goat Producer Societies, at a rate of one each in all the 14 Districts.
- *Ksheerasaagaram.* The Ksheerasaagaram project is a cow-rearing initiative which will provide capital subsidy to Kudumbashree groups to establish cow-rearing unit. As of now, 410 units were established throughout the state,
- *Dairy Value Added Product Units.* A total of 27 Value added units in dairy sector across the state were started and the product is being marketed in the brand name Milky Latte. This will provide a steady income for Kudumbashree members and also ensure safe and clean dairy products to consumer.

Tribal Interventions. Tribal interventions of Kudumbashree ensured 96.8 % inclusion of members to its NHG fold. The tribal animators (community resource persons) in the field are rigorously working for the empowerment of tribal families through Kudumbashree. The main strategy used has been continuous capacity building programme at the hamlet level. Every programme reaches hamlets through the community volunteers named as animators.

- Self-reliant Tribal NHGs -The main objective of tribal intervention schemes undertaken by Kudumbashree is to set a stable platform for implementing development activities among 20 tribes. Here 2303 NHGs have been recognised as self-reliant NHGs as on 11-September-2020.
- NHGs capacity building programme: In this scheme, 1222 tribal NHGs have been selected for setting up of the best NHGs. Provision of all necessary capacity building training for these NHGs already completed in every district till March 31st, 2019.
- Corpus Fund to new NHGs and new JLGs: - The Tribal special project facilitates the creation of ST NHGs as well as at ADSs, if necessary, in areas where there are more than two Tribal NHGs. The project provides a corpus fund of Rs. 10,000 at all newly formed ST NHGs.
- Traditional Micro-Enterprise unit: The promotion of traditional as well as modern livelihoods and enterprises are also envisaged for the year 2020-21. They are designed to conduct tribal Art/Craft/Ethnic food festivals both at district and state level to motivate new entrepreneurs.
- Animal Husbandry based livelihood programmes: - Support for income-generation through animal husbandry for 50 tribal vulnerable families has been envisaged. This includes the goat-rearing and small poultry units both individual and group.
- Bridge Course (Gothragurukulam) and PSC/competitive exclusive programme (Gothramunnettam): - A 'Bridge Course' is yet another innovative idea being implemented by Kudumbashree Mission in tribal hamlets of Attappady in order to support those who are weak in studies and show inconsistency towards schooling. Altogether, near to 1081 children benefitted from this educational involvement as on 11-September-2020. Competitive exam-based crash courses are being provided to 2893 tribal students as on 11-September-2020.
- District initiative for tribals: The District Mission will develop a separate plan for every tribal hamlets, and it will be implemented in connection with the District initiative programme.

Labour Department

Saranya. This is a self-employment scheme for the most vulnerable sections among women in the State registered in the Employment Exchanges, including widows, divorcees, deserted women, spinsters above the age of 30 and unwed mothers belonging to Scheduled Tribes. Under this scheme, interest-free bank loans of up to Rs. 50,000 with a 50 per cent subsidy (maximum Rs.25,000) is given for starting self-employment ventures. In 2017-18, **3828** beneficiaries got the assistance; in 2018-19, there were 3546 beneficiaries. About 2200 women who have received training in activities they want to pursue, will be provided with self-employment assistance under Saranya in the 100 days programme.

Kerala State Physically Handicapped Persons Welfare Corporation

The increase in women's employment in some **Departments like Police and Excise** have been commendable. In 2017, 605 police constables were recruited, with another 154 in 2018. In the Excise department, 133 women were inducted for patrolling in 2018.

Summing up. There does appear to have been a real increase in casual labour and self-employment in the recent years; and some increases also in regular formal employment. However, more probing needs to be done to identify sectors in which regular employment fell in 2018-19.

Gender Wage Gap

Unlike the Employment Unemployment Surveys of NSSO which collected data for regular salaried and casual wage workers, PLFS collects information on earnings from self-employment also. Using 2017-18 we give below the wage profile. Given the type of increase in employment that has occurred it would be interesting to examine the relative differentials between the type of wages and between genders. (see Table 6). Some distinct features emerging from this Table:

- i. As mentioned earlier, earnings in each type of employment are higher for Kerala women (and men) in rural and urban areas.
- ii. Regular salaried wage is the highest both in rural and urban areas, while earnings from self-employed are the lowest.
- iii. Urban wages for all categories is higher in Kerala and India, though the difference is small in rural casual employment in Kerala (certainly a gain from the strong Agricultural Workers movement)
- iv. Wage gap is high in casual employment in Kerala. It is least for regular salaried.
- v. In self-employment, the difference is very high for India as also for Kerala but average earnings from self-employed women is much higher than for counterparts in the rest of India.
- vi. Self-employed women in Kerala earn a much better wage than at the All-India level, but the gender gap is still high; the larger increase for women in self-employment in 2018-19 was as own account workers and not as helpers. The need for greater handholding here is very clear.

Table 6: *Average daily wage for those aged 15 & above in employment by sector & sex, 2017-18*

Casual Employment

	All India				Kerala		
SourceSector	Male	Female	Total	Sector	Male	Female	Total
Rural	265.2	172.3	243.9	Rural	533.9	284.7	478.9
Urban	320.5	200.7	302	Urban	506.3	288.7	477.5
Total	276.4	176.1	254.8	Total	522.5	285.8	478.3

Gender wage gap(F/M)		63.4				54.6	
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Self Employed

	All India				Kerala		
Sector	Male	Female	Total	Sector	Male	Female	Total
Rural	260.1	59.5	221.6	Rural	440.6	168.6	397.9
Urban	478.8	179.2	434.4	Urban	545.2	270.2	506.9
Total	318.4	84.6	276.1	Total	489.9	212.8	448.6
Gender wage gap(F/M)		26.6				43.4	

Regular Salaried

	All India				Kerala		
Sector	Male	Female	Total	Sector	Male	Female	Total
Rural	453.9	309	426.6	Rural	579.1	430	523.5
Urban	614.7	505.1	591.1	Urban	658.2	688.7	670.1
Total	554.4	439.2	530.8	Total	621	571.8	602.2
Gender wage gap (F/M)		79.2				92.1	

Source: PLFS 2017-18

Needless to say, while there is no doubt that the efforts of the government to generate employment for women has indeed yielded positive outcomes in terms of a significant increase in female WPRs, there is urgent need to provide quality employment, given the educated workforce and the emphasis on new skilling programmes. However, a word of caution here. The technical definition of skills that are “modern” technological knowledge is very often overemphasised. It tends to underestimate skill requirement in areas where what is existing is actually considered unskilled or semi-skilled, largely done by women. For example, early childhood care, education of children, and geriatric care or “soft skills”, like communication, working together etc. are less emphasised in skilling, although they are as important as professional skilling.

There has been considerable recruitment of women workers in formal employment in the government sector – in the police force, health, education and public sector undertakings, and the next PLFS Round should reflect this. However, the Pandemic is likely to upset this increase.

The gender wage gap is a worrying aspect of the female labour market and remains a dominant issue to be addressed in future planning.

CHAPTER 8.4

KERALA BEYOND THE BORDERS

Migration is a process of shifting within or across the borders, sometimes temporarily, seasonally or permanently. It is generally associated with the matter of choice, most preferably considered it as voluntary in nature⁴⁸. Migration can be used as a tool or key to eradicate poverty and the economic opportunities in foreign countries are the strong driving forces of Migration. People are always on the move for searching safer better environment to live peacefully and for economic prosperity and hence migration is considered as an engine of growth and development.

Improved transportation facilities and modern technologies make it easier for people to move beyond the borders. Around the world, 258 million people or 3.4 percent of the global population live outside their home country. The international migrant population is now tripled with its early 1970 level. Work and high income is the main motive source for migration. Migrant workers comprise 2/3rd of all international migrants, and most move to high-income countries. For these individuals and their families, migration can bring considerable gains in terms of income, education and health. The remittances constitute \$613 billion in 2017 which provide financial flows and a stable source of income to a large number of people. For host countries, immigration can increase labor supply, improve productivity, and ease pressures on pension systems. (Jia Feng, 2018⁴⁹). The report emphasizes that migration matters to economic prosperity, human development and security, and ensuring safer and better-regulated migration has become a global priority.

Table 1. International migrants, 1970–2019

Year	Number of Migrants in Million	Migrants as per cent of world population
1970	84	2.3
1975	90	2.2
1980	102	2.3
1985	113	2.3
1990	153	2.9
1995	161	2.8
2000	173	2.8
2005	191	2.9
2010	220	3.2

⁴⁸ Sarah Opitz Stapleton, Rebecca Nadin, Charlene Watson and Jan Kellett- Climate change, migration and displacement – The need for a risk-informed and coherent approach – UNDP Report 2017

⁴⁹ Jia Feng, IMF Communication Department, Finance and Development, December, 2018)

2015	248	3.4
2019	272	3.5

Source: UN DESA, 2008, 2019a, 2019b.

For the past five decades, the number of estimated migrants has been increased. The total estimated 272 million people living in a country other than their countries of birth in 2019 was 119 million more than that in 1990, and over three times the estimated number in 1970 (see table above). While the proportion of international migrants globally has also increased over this period, it is evident that the majority of people continue to live in the countries in which they were born. A large number of people continue to their native places in their own country amidst the increase started among the proportion of international migrants. According to **World Migration Report 2020**, 74% of the international migrants were of 20 to 64 years of working age with a slight decrease (from 16.4% to 14%) in migrants younger than 20 years old from 2000 to 2019 while around 12% of international migrants constitutes 65 and above older age group since 2000.

International Remittances

Remittances are money or in-kind transfers made by NRKs directly to families or communities in their countries of origin. There was a 9 per cent increase in remittances in 2018, up from \$ 633 billion in 2017. However, the 2 consecutive years prior to 2017 witnessed a dwindle; from 2014 to 2015, global (inward) flows of remittances reduced by an estimated 1.2 per cent, from \$ 603 billion in 2014 to \$ 595 billion in 2015, and by another 1.1 per cent from 2015 to 2016 (from \$ 595 billion to \$ 589 billion).

According to World Migration report 2020 the top five countries sending remittances include USA, UAE, Saudi Arabia, Germany, and Switzerland. The United States remained the top remittance-sending country (USD 68.0 billion) followed by the United Arab Emirates (USD 44.4 billion) and Saudi Arabia (USD 36.1 billion)

Table 2 Migrant remittance inflows to India

Year	Migrant remittance inflows (US\$ million)
2015	68,910
2016	62,744
2017	68,967
2018	78,790
2019	83,131

Source: World Bank staff calculation based on data from IMF Balance of Payments Statistics database and data releases from central banks, national statistical agencies, and World Bank country desks.

The table shows the last five years Migrant remittance inflows to India. Except in 2016 the remittance flow gradually increases and the share of remittances is 2.8% of GDP in 2019.

Kerala Migration and Remittances Status

There are 21.22 lakh emigrants from Kerala living across the world (Kerala Migration Survey, 2018). Gulf is the leading destination of Kerala emigrants as over 89 percent of emigrants are working in gulf countries. The remittance received from the emigrants is an instrumental factor of smooth functioning of economic activities in the state. Not only it increases state income but also augments consumption, savings and investment, value addition in manufacturing and industrial development

According to the Reserve Bank of India's Survey on India's Inward Remittances (2018), Kerala receives 19 percent of the country's total remittances. The direct means by which remittances flow to the State are through NRI deposits in commercial banks and money transferred through authorized foreign exchange dealers. In addition, some scholars have also considered, when estimating remittances, the value of commodities received in kind by households in the State from emigrants. In addition, there are also illegal routes by which transfers are made. In this crisis period, illegal transfers might have reduced (Report- State Planning Board 2020)⁵⁰.

As predicted in 2013, the Kerala Migration Survey in 2018 shows a decline in emigration. The total number of emigrants in 2013 was 24 lakh and it decreased to 21 lakh in the year 2018. This recorded a decline of around 12 per cent from 2013 to 2018. As per Kerala migration survey, about 90 per cent of Kerala migrants leave for the Gulf for temporary contract employment and the Gulf does not offer citizenship and all of them have to return back to Kerala once their contract completed. The number of return emigrants estimated by KMS 2018 is 12.95 lakh, about 60 per cent of the number of emigrants. KMS 2018 has confirmed the trend that was observed in the last round – that emigration from Kerala is falling and return migration is on the rise.

As per the Kerala Migration Survey remittances received by the households is estimated by adding the following four components and the total remittances comprise of all these components.

1. Cash Remittance (in Rs.)

⁵⁰ Report - Impact of COVID-19 on Remittances and NRKs 2020, State Planning Board- Submitted to Government of Kerala

2. Total Money value of goods received as gifts (in Rs.)
3. Special remittance to buy house/ land/ car (in Rs.)
4. Total money value of special remittances not included above (in Rs.)

It is very difficult to get a concrete statistics of all these components because not all the emigrant households responded to such questions, and some respondents were unaware of the amount, and some of the emigrants were not sending any money to the households. However among the available information, KMS forecasts an estimate of the total of all the household remittances (HR) in Kerala during the 12- month period prior to 1st March 2018 was Rs. 30,717 crores.

Table 3 Trend in Household Remittances to Kerala

Years	Remittances (crores)	% increases
1998	3,530	--
2003	7,965	125.6
2008	12,511	57.1
2011	15,129	20.9
2013	24,374	61.1
2018	30,717	26.0

Source: Kerala Migration Survey 2018

Covid 19 Impact on NRK Remittances

The shortfall in remittances because of Covid-19 is estimated by analysing the level of NRI deposits in major commercial banks (as per data provided by State Level Bankers Committee) and the reduction in the private money transfer through authorized foreign exchange dealers (as per data provided by authorized dealers).

It is estimated that the average monthly remittances through private receipts to the State in 2020-21 will be Rs. 8756 crore. Some of the emigrants rely on private money exchange dealers for transferring of cash. As many of them have lost their jobs and returned to Kerala, there has been a drastic reduction in transfers through exchange dealers. As per the information gathered from authorized foreign exchange dealers, there has been a reduction of 65 per cent in private transfer from January 2020 to May 2020, almost to the extent of Rs. 5691 crore in absolute terms (Report-State Planning Board 2020)⁵¹.

Government Initiation towards NRKs through NORKA ROOTS

NORKA ROOTS has prepared and introduced many programmes/schemes/activities on behalf of Non Resident Keralites and they are categorized in to four groups, ie;

⁵¹ Report - Impact of COVID-19 on Remittances and NRKs 2020, State Planning Board- Submitted to Government of Kerala

- Keralites who are working in foreign country
- Returnees from foreign countries
- Keralites who are working in other states
- Keralites who are going to foreign countries for their livelihood

NORKA ROOTS intervenes for the welfare of NRKs through different schemes like Santhwana, NDPREM, Emergency Ambulance service at Airports, Pravasi Legal Aid cell, Emergency Repatriation Fund etc.

Achievements of NORKA ROOTS

Santhwana

The scheme has been launched for NRKs whose annual income is below Rs.1,00,000/- and similarly placed dependents of deceased NRKs to meet financial requirements on account of death, marriage, medical treatment and mobility equipments for differently abled.

In 2019-20 an amount of Rs 24.25 core has disbursed under the scheme for 4102 beneficiaries. Death due to COVID 19 has also been included under the purview of Santhwana schme. During the last four years an amount of Rs. 77 crore has been disbursed to more than 13000 beneficiaries.

NDPREM

It is a rehabilitation package that aims to help the returnee migrants who have worked abroad for at least two years to continue living a dignified life. Under this scheme, subsidy is extended for entrepreneurs having a seed capital of Rs.30 lakhs and upon prompt repayment, 15 per cent subsidy on capital and 3 per cent rebate on interest of loan are offered for the first 4 years.

An amount of Rs. 53.43 crore was distributed among 1043 beneficiaries in 2019-20 and the number of partner banks has been increased to 16 and reduced the lock in period to get capital subsidy from 4 to 3 year. The scheme NDPREM was included in Chief Minister's Entrepreneurship development Programme. In the last four years an amount of Rs. 45.21 core has been disbursed to 2895 beneficiaries.

NORKA Global Contact Centre

As a measure towards educating emigrants, particularly the vulnerable category about emigration procedures, the risks involved in irregular migration and the precautions to be taken while seeking overseas employment, a 24 hour helpline for information dissemination and grievance

redress of the NRKs has been set up. Non Resident Malayalees can contact to this centre 24*7 via live chat, email, and SMS. More than 3 lakh NRKs around 30 countries have used this service from 15.02.2019 February 15th to 06.10.2020.

Emergency Ambulance Service

Many NRKs fall ill or meet with accidents while working abroad and after that they need to come back to Kerala and continue the treatment here. In order to assist such NRKs who are financially poor and also for transportation of mortal NRKs, Ambulance support is planned to be provided at the airports. Norka Roots may work in association with Indian Medical Association (IMA) in this regards. Around 650 services were made possible through this service including the corpse and many critical illness patients from different parts of the world.

Pravasi Legal Aid cell

It has been noticed for a long time that a number of Malayalees are languishing in the prisons of foreign countries especially in GCCs for minor or petty offences or offences without their knowledge. Ignorance of Law of the Land and language problems are the major reasons for them ending up in prisons. According to the scheme 11 legal consultants were appointed in 6 GCC countries. 110 applications were received in different cases and around 100 cases were transferred to legal consultants to take necessary action.

Pravasi Legal Aid Cell is a scheme initiated to address such issues and help to save the poor from the jails. Legal Consultants in six GCCs are deployed so far and cases have been forwarded to them for consideration under the scheme.

Emergency Repatriation Fund

On account of civil unrest and natural calamities, Non-Resident Keralites have to be evacuated from their places of work or residence, in collaboration with MEA, Government of India. The activities coming under this programme are financing economy class travel, accommodation in Kerala House, immediate expenses etc. As per the scheme 14 corpse and around 100 patients have entered in to their home land.

Loka Kerala Sabha and its activities

The Government of Kerala constituted Loka Kerala Sabha (LKS) as a common platform for Keralites living across the globe; it is envisaged as a platform for the cultural, socio-political and economic integration of these myriad Keralas with the home Kerala. The Government of Kerala

believes that the knowledge and experiences of the non-resident Keralite, in her capacity as a Global citizen, can be an asset to the development of the State.

The first Loka Kerala Sabha held on 12, 13 January 2018 in which several worthy suggestions had emerged. The Government of Kerala constituted seven sector-specific Standing Committees as shown below for materializing the viable suggestions.

Sl No	Standing Committee
1	Loka Kerala Sabha Administration & Kerala Development Fund Creation
2	NRK Investment & Security
3	Rehabilitation & Post-Return Income Generation Programmes
4	Quality & Prospects of Migration
5	Migrants' Law & Welfare of Migrant Women
6	Migration & Cultural Exchanges
7	Issues of Keralite Diaspora within India

These Standing Committees have conducted meetings and furnished their reports along with 48 recommendations. The first meeting of the LKS Secretariat was held on 30 September 2018. After diligently scrutinizing the 48 recommendations of the Standing Committees, based on feasibility, practicality, and availability of funds, the LKS Secretariat has merged/grouped the vital suggestions into the 10, during their meeting on 15 November 2018 for actualization.

A. Investment

1. Formation of NRI Investment Company
2. Formation of NRI Co-operative Society
3. Formation of NRI bank
4. Formation of NRI Construction Company

B. Welfare

1. Formation of Women NRI Cell, Provide Health Insurance.for returned
Emigrants
2. Formation of Migration Facilitation Centre & Pre-embarkment

Orientation Centre

C. Skill Development.

1. Formation of High-Power Committee (Skill enhancement)
2. Formation of International Migration Centre

D. Art & Culture

- 1.. Conduct of NRK Youth Festivals
2. Publication of journal for NRKs

All the recommendations except Formation of Migration Facilitation Centre, Pre-embarkment Orientation Centres, formation of NRI Bank & NRI Youth Festival have been successfully implemented.

The second Loka Kerala Sabha was successfully conducted on 1st - 3rd January 2020. And the suggestions received from the sessions have been sought out for further studies. But due to the current situation, no activities have been taken up so far. Also it is planned to conduct the third Loka Kerala Sabha in the coming financial year.

In connection with Covid 19 pandemic, Hon'ble CM held Video conference with LKS members and directed them to actively involve among pravasi community in their respective countries and extend all possible measures to help them to overcome the situation. Accordingly, NORKA International Help desk has set up with LKS Members, Norka Roots Directors and other organization in the following 1-8 countries where Malayalee diaspora are mostly available.

UAE, Saudi Arabia, Oman, Buhrain, Qatar, Kuwait, USA, UK, Zambia, West Indies, Germany, Botswana, Norway, Ireland, Canada etc have actively intervened to provide assistance by their own way, at the community level and through the Embassy to address the problems of distressed expatriates.

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COVID 19 in Indian Context

Inflow of return emigrants

Since the outbreak of covid-19 pandemic, there has been a considerable inflow of return emigrants into the state from various countries. Around 4.81 lakh emigrants have returned to Kerala from January, 2020 to August, 2020. Of which, 56 per cent have lost their jobs. Apart from that there are 372 emigrants died in different countries due to Covid 19 as on 19.08.2020 (Norka Roots).

Returnee Status

In the wake of Covid 19, central government has stopped flights and suspended operations from 24.03.2020 to 06.05.2020 to resist the wide spread of corona virus pandemic. In the context of Government of India permitting Indian nationals stranded outside the country to return to India,

⁵² Report - Impact of COVID-19 on Remittances and NRKs 2020, State Planning Board- Submitted to Government of Kerala

there has been huge demand from the expatriate Malayalees living in various countries, to allow their return to Kerala. Government of India has made arrangements to bring them to Kerala by air and sea from 07.05.2020 through *Vande Bharath* mission, operation Samudra Setu and chartered flights'. The available details of the returnees as per COVID 19 jagratha portal are shown below:

Sl No	Country	Number of Returnees
1	United Arab Emirates	189295
2	Kingdom of Saudi Arabia	59608
3	Oman	33998
4	Bahrain	14611
5	Kuwait	21222
6	Qatar	36224
7	Others	22120
Total		377078

Source: NORKA ROOTS

The details of the returnees from various states are shown below:

Name of State	No of Returnees
Karnataka	183820
Tamilnadu	168093
Maharashtra	72176
Delhi	38656
West Beneal	24730
Telengana	18503
Uttar Pradesh	18397
Rajasthan	11780
Bihar	11126
Guiarat	10547
Andhra Pradesh	10086
Assam	8214
Madhya Pradesh	7531
Odisha	5868
Haryana	5762
Jammu & Kashmir	5685
Jharkhand	4449
Punjab	4260
Lakshadweep	4122
Goa	3515
Uttarakhand	1889

Chattisgarh	1843
Puducherry	1717
Arunachal Pradesh	970
Andaman & Nicobar Islands	958
Himachal Pradesh	734
Nagaland	555
Chandigarh	541
Manipur	513
Meghalaya	509
Ladakh	467
Dadra & Nagar Haveli and Daman & Diu	451
Tripura	365
Sikkim	219
Mizoram	105
Total	629156

Source: NORKA ROOTS

Special Assistance in the Context of COVID 19

Government of Kerala has announced following financial assistance to the NRKs:

- Rs 10,000 is given as financial assistance to the members of the Pravasi Welfare Board who are infected with Corona Virus. For non-members, the same amount will be released from Norka Roots under the scheme - Santhwana. An amount of Rupees one crore has been released to Norka Roots in this regard. As on date 18.09.2020, 20 applications have been received and are under process.
- Rs. 5000 is given to those who returned to Kerala from 1st January 2020 and could not return to resume their work, due to lock down imposed by Government of India. In this regard, an amount of Rs 57.5 Crore is sanctioned and more than 1.75 lakh applications are under process. 78,000 applications were approved and an amount of 39 Crore has been released to eligible persons so far.

Future plan of NORKA Roots

Rehabilitation

NORKA ROOTS has launched NORKA Skill Repository [NSR] portal for our returnees which aims to create a database, based on their skill sets and experience. It also provides the possibility to connect the returnee with potential employers to integrate and rehabilitate Pravasis in Kerala. It also opens a platform for self employment, enterprises creation, up skilling and investment support.

Critical illness care

Norka Pravasi Raksha Insurance (NPRI) Policy launched with a purpose of Critical illness Care for the Non Resident Keralites residing or working abroad. The valid term of 'the policy is one year The policy holders will get an insurance coverage of Rs.1 Lakh for Critical illness The policy also has an add on benefit of Personal Accident Insurance coverage to the tune of Rs.2 lakhs for life and a maximum of Rs.1 Lakh for permanent disability. Pravasi residing or working abroad with a valid passport and visa for at least 6 months of age group from 18-60 years can apply for NPRI policy. Application can be submitted online with a registration fee of Rs.550/- (including premium).

13 critical illnesses including cancer, kidney failure, organ transplant, stroke and paralysis are covered under the policy

Strengthening and Widening the Scope of NDPREM

NDPREM is a government scheme implemented by Government of Kerala for effective rehabilitation of returned migrants. Subsidy for entrepreneurs having a seed capital of upto Rs. 30 lakhs is a key feature of NDPREM. For prompt repayment, 15% subsidy on capital and 3% rebate on interest of loan are offered for the first 4 years.

Considering the large inflow of job lost pravasis, the scope of NDPREM is proposed to be widened. For this, we are now associating with the projects of Meat products of India, CM's Entrepreneurship Development Program by KFC, Pravasi store scheme by Supplyco and startup mission scheme. It is expected that a number of new generation returnees can be attracted to the benefits under this scheme.

The prime objective of NORKA ROOTS is to assure NRK welfare and to serve as a single window for all information related to them. It is the Government's firm determination that Loka Kerala Sabha can address all issues and concerns regarding NRKs by providing a more comprehensive democratic space wherein these outer Keralas are duly mentioned.

Migration is good for all the economy, provided that adequate and tested policies are put in place to govern the immigration system and border protection. The demand for highly skilled international migrants will continue to expand over the years as the ageing population in most developed countries continue to escalate in tandem with low fertility rates.

CHAPTER 8.5

GUEST WORKERS AND KERALA ECONOMY

With upsurge in Gulf emigration, improved standard of living due to large scale inflow of remittances and rising share of elderly population in Kerala, the domestic labour supply for low skilled jobs declined massively. Moreover, increased private investment on housing and the growth of labour intensive industries have increased the demand for low and semi-skilled workers in Kerala. To fill this increased demand-supply gap, large number of other state migrant workers moved to Kerala seasonally.

However, this rising trends of seasonal migration is not captured by national level data. As per Census data number of other state migrants in Kerala increased from 4.5 lakh to about 6.5 (about 2 lakh increase) during the period 2001 and 2011 (See Parida and Raman, 2020). This implies an annual growth rate of 4.5 per cent. But both the studies of Narayana and Venkiteswaran (2013) and Parida and Raman (2020) claim that the stock of other state migrants increased massively during the post 2011 periods in Kerala. While Narayana and Venkiteswaran (2013) based on survey of railway passengers estimated a stock of 25 lakh domestic migrants, Parida and Raman (2020) based on a sample survey projected it about 30 lakh as in 2017-18.

Parida and Raman (2020) further explored that the share of migrants reporting long duration migration has been declining with corresponding rise in the share of short duration and temporary seasonal migration for construction and other low paid jobs in the labour intensive manufacturing and informal service sectors in Kerala. While the number and share of migrants from neighbouring states like Tamil Nadu, Karnataka, and Maharashtra has been declining, domestic migration from West Bengal (41 percent), Assam (31 percent), Uttar Pradesh (13 percent), Bihar (4 percent), Odisha (4 percent) and Jharkhand (2.5 percent) is rising massively in the recent years. The migrants from these backwards states normally come to Kerala seasonally for employment, earn some surplus and go back to their home states. Since, they visit their native states most frequently (more than 3/4 times a year); national level surveys (both Census and NSS) fail to capture them due to their definitional issues.

The guest workers contribute significantly to the development of the various sectors of the economy. Mostly engaged both in unskilled and semi- skilled workers such as agricultural – brick kilns labour, Masonry, Electrician Plumbing and the like. A large number of guest workers work in plywood – steel factories mainly in Ernakulum, Kozhikode and Kannur District. A large number of ISM workers are concentrated particularly in Plywood factories in Perumbavoor area. The said report has recommended that the State Government need to take steps to improve the housing and living conditions for their socio – economic well being.

Given the important role these migrant workers play in driving the process of economic growth in Kerala, special attention should be given to encourage and protect them. Since a large proportion of these migrants are not enrolled in AWAZ schemes, an alternate social insurance arrangement is necessary for protecting these vulnerable workers in Kerala.

Kerala is probably the first state to introduce a Welfare scheme for the migrant workers. The Kerala Migrant Worker's Welfare Scheme 2010 is a bouquet of schemes. AAWAZ is a Health Insurance Scheme for Migrant Workers aimed at providing claims against accidental death, (Rs.2,00,000/- Rupees two lakh only), disability due to accident (Rs.1,00,000/- Rupees One lakh only) , treatment benefit to the patients (Rs.25,000/- Rupees Twenty five thousand only) with an objective of registering them and providing health care, as cash less in patient care under the scheme. An estimated population of 15 lakh individuals in Kerala will be covered under the scheme. Process of identifying the beneficiary may be carried out through an online portal. This scheme started on 01.11.2017. The enrolment is on the basis of their identity proofs including Aadhar Card. About 509363(Five lakh Nine thousand and three hundred sixty three only) guest workers were already registered under the scheme. (Male-483085, Female-26191, Transgender-87)

The Apna Ghar Project of Bhavanam Foundation Kerala (BFK), was envisaged to provide good quality decent hostel accommodation with all basic facilities on rental basis to Inter State Migrant workers while working in Kerala. The project is proposed to be implemented in areas where there is a significant need for such accommodation for ISM workers in locations across Kerala. BFK is implementing various Schemes under the ApnaGhar Project in different locations across Kerala. The Apna Ghar Project – Palakkad Scheme which can accommodate 640 persons is commissioned during financial year 2017-18. In addition, BFK is in the process of implementing three more Schemes namely the ApnaGhar Project – Ramanattukara Scheme (Kozhikode District), ApnaGhar Project – Kalamassery Scheme (Ernakulam District) and Apna Ghar Project – Champazhanchy Scheme (Thiruvananthapuram District). BFK has obtained one acre of land at KINFRA. The government also intends to announce a scheme for affordable rental housing for migrant workers and urban poor. The plan is to convert government funded housing in cities into Affordable Rental Housing Complexes (ARHCs) under PPP mode.

Awareness programme for ISM workers: The scheme envisages dissemination of information regarding the various welfare schemes and statutory entitlements to the ISM workers across the state. This continuing scheme is being implemented in every district through the District Labour Offices concerned. In the financial year 2019-20 Rs.45.50 lakh has been expended for this purpose, Rs.44 lakh has been outplayed, but could not be expended due to the prevailing COVID pandemic related lock down.

Medical Camp: Medical camps are being conducted in the state exclusively for the Inter State Guest Workers. Medical team consisting of doctors, Lab technicians and pharmacists along with the officials of

Labour Department, conducts medical camp in each districts of the state. consultation for common deceases, dental problems, skin deceases malaria, HIV etc are being carried out in this camp. Fund for conducting medical camp are provided by the Government every year.

The Labour Codes recently passed by the government of India which would require universalisation of right of minimum wages and timely payment of wages to all workers including unorganized workers, and a national floor-wise wage rate so that uniform wage rate prevails across states. As migrant labourers mostly come alone without their family and in that case would be eligible for rice only. Those who are not migrating as family, may not benefit entirely from this policy measure. Much more clarity is required with respect to the state level implications of Labour Codes.

CHAPTER 8.6

SKILL DEVELOPMENT AND CAPABILITIES

Envisioning skill development for the future must factor in the future demand for skills and the population structure. We had noted earlier that Kerala is a high achiever in general education yet has very low penetration of technical and vocational skills training in the general population. In terms of labour market outcomes we saw that though educated workforce did lead to higher productivity growth in Kerala the demand for such workforce was limited as the production base of Kerala still remains somewhat traditional and narrow.

Widening the production base may be a solution but given Kerala's small size and high achievement in education, it may be more viable for re-focusing of production for which entrepreneurial training along with specific skills is inevitable.

Given the context of shrinking public sector and its narrow production base a central focus of the employment strategy for Kerala should be enhancing self employment. The "Start up" environment in Kerala had been very healthy enabling the "Kerala start up mission" of the government of Kerala to be a game changer. Kerala was ranked the best state for start ups consecutively for the last two years. So this is a good beginning in the right direction of entrepreneurship development. The future in terms of entrepreneurship seems to be bright in Kerala currently. The need is to reach out to the various socio-economic groups and communities in Kerala.

In terms of sustainable development for the economy, there are huge opportunities that remain untapped. These opportunities are but rooted in local resources and local knowledge. As we stated earlier envisioning Kerala as a sustainable economy must refocus the growth path away from environmental degradation to rebuilding and sustaining. However, development of an economy rooted in the local is challenging if one has to plan for it. Skill training and skill building around codification and standardisation of local resources remains unexplored. Further, developing technical and marketing skills for the use of local resources must be developed. As is well known, the agricultural lands of Kerala is highly fertile and the forests land are highly diverse. Producing and marketing high value adding goods from local resources would retain the local ecology of the region at the same time lead to higher incomes for the market participants⁵³. An area that remained unresolved despite its immediate relevance in Kerala is waste management. Skill development, both technical and entrepreneurial skills on this would be necessary in future to manage wastes, reuse and recycle. Another resource that is locally available are return migrants with their technical and entrepreneurial knowledge. Having worked in different countries

⁵³Just to illustrate the point the shelves of supermarkets in Kerala is filled with soft drinks enabled with 'nata de coco'. Nata de coco is processed coconut water, a product that is available in large scale all over Kerala. Yet these products had to be imported from Thailand and Indonesia to consume in Kerala.

with different technologies and skill groups, the return migrants carry with them a rich array of knowledge that can be used to skill potential migrants.

Kerala should be able to leverage its progress in education to its advantage. The high rates of educated unemployment in Kerala partly is due to problem of employability. Towards this direction a healthy private public partnerships in skill training is being developed in Kerala through various schemes of KASE and ASAP. However, many of the KASE partners are private trainers and not actual users of the skills. It is essential to encourage the industry to enter as training partners in skill development so that industry ready skills are developed during their education itself. In this context the German dual vocational training model may be inspirational. Germany was able to reduce its educated unemployment among the youth drastically in the early 2000s through this dual VT programme. The South Korean model of building an employee skill base through rounded education, attached to specific industries is also a very imitable model that Kerala should be thinking of.

The problem of employability partly is due to fast changing technologies of production and services and thus creating skill obsolescence. In the emerging sectors, globally, skill obsolescence is a matter of serious concern, making workers of long years of experience less skilled to handle new technology. This frictional unemployment problem has to be solved by providing options for re-skilling at later stages of life cycle of the workers. There should be institutions that re-skill older workers with the newer developments in their trade, such that they remain relevant to the market.

In short, skill development should respond to market requirements. An economy based on growth, equity and sustainability would demand such skills that are rooted in the local yet exploit technology to its advantage. A skill development eco-system that encourages Public private cooperation, university-industry interaction and local participation can be the imagined future for the sustainable equitable growing economy of Kerala.

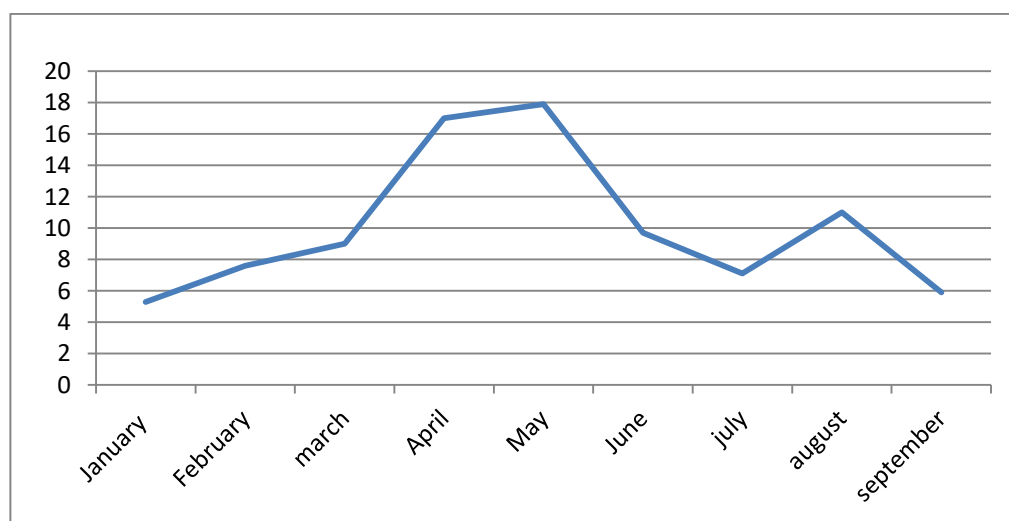
Education and skills form the basis for a livelihood and labour centric growth as mentioned above. While it can be stated that the educational achievement of Kerala population is high the fact that about 79 % of the population had only higher secondary level of education or lower, may not augur well for an economy aspiring to grow on high technology and skill intensive sectors. The share of population that have had some form of technical education is very low. Formal vocational training was acquired only by 3.8 % of the Kerala population. Kerala has achieved much in terms of general education, it has had limited success in skill development, especially in terms of technical and vocational training. The Government of Kerala has taken various measures to enhance the skill content in the Kerala population. One of the pioneering attempt is the setting up a non-profit public company, the Kerala Academy for Skills Excellence (KASE), as a nodal agency for carrying out skill development activities in the state. The future focus should be to ensure self employment is encouraged. Further the institutional rigidities that is associated with self employment is reduced and the risks associated with self employment is sufficiently covered.

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A note: The impact of Covid19 on labour and state efforts towards mitigation.

Covid19 undoubtedly is the biggest shock to the global economy in the recent past. India and Kerala in particular has been affected due to the virus. As on 3-10-2020, India had 9.4 lakhs active covid infection cases, and one lakh deaths due to covid. Kerala had 77 thousand active cases and about 800 deaths(www.covid19india.org). The measures imposed to control the spread of the virus, included social distancing, wearing masks, containment zones, hotspots and lockdown. Lockdown and containment policies by the government severely affected the workers' livelihood. As mentioned earlier most workers in India and in Kerala are informal workers in the unorganised sector, thus keeping them vulnerable even during their normal work periods. A telltale sign of vulnerability among such workers is their inability to meet their basic needs with the loss of job even for a day. Under such conditions workers would have been deprived of fulfilling their basic needs under the crisis. As can be seen in the graph below the unemployment rate in Kerala had increased drastically during the lockdown months of April and May in 2020. Thereafter the rates fell and are currently comparable with pre-lockdown measures. However, we need to keep in mind that this post-lockdown measure of unemployment implies a different type of labour market compared to the pre-lockdown market. Most of the migrant workers, who had left kerala after movement restrictions were eased in May 2020, have not returned to Kerala. Moreover, there could be a large number of persons who would have withdrawn from the labour market unable to find jobs, i.e., discouraged workers. In such circumstances, the post covid19 unemployment rates though somewhat comparable to the pre-covid must be worrisome.

Figure 1: Unemployment Rate in Kerala-2020



Source: <https://unemploymentinindia.cmie.com> accessed on 3/10/2020

The crisis has led many firms to layoff workers from the plants. Production stoppage, accumulated stocks, break down in supply chains have all led to large labour surplus. Many firms have resorted to layoff of workers during the pandemic. The government had appealed to not lay off workers citing moral obligations. But firms, in turn would claim that it is the government that is morally obligated to provide jobs, not private firms. Loss of employment, loss of wages and difficult conditions of work are meted out on a daily basis even in high value adding sectors such as the IT sectors. Laying off of workers in the sector can be done without delay. The existing institutional structure does not support the workers in claiming their right to work and livelihood, which makes it easy to lay off workers, cut salaries with impunity. Why with the state government itself issuing salary deferment it gives signals to the private sector to respond in similar but more stringent manner.

Work from home has become the norm for a large share of the workers. With the workspace moving to home, the monitoring costs multiplies, and hence the wage payment is bound to shift from time based work to piece rated work. Piece rated work is an invitation to self exploitation, especially during a pandemic when the demand conditions are low.

The types of workers, regular wage employed, contractual worker, casual wage employed, self employed worker, migrant worker meant different worlds during the pandemic. For the regular work, the pandemic was an inconvenience, with some reduction in earnings, suffer some salary deferments or no DA payment etc. For the contractual worker the pandemic still allowed to retain the job and salary, but the possibility of loss of job in immediate future is imminent. Moreover, the contractual worker is now to be present in their workplace, by some means, it does not matter how and substitute, in most cases for the permanent worker, who goes on long leaves fearing the disease. For the casual worker, there is no job at all. For the self employed, there is job but reduced earnings as establishments remain shut due to the lockdown. For the migrant worker along with loss of employment and loss of wages the cost of returning to their place of origin and cost of survival is an additional burden.

The abovesaid issues though common to both the national and provincial governments, the Kerala state had responded by being proactive in many ways. The dilution of labour laws was opposed by the state government. During the pandemic recognising the fact that citizens rights could be realised effectively only by providing them with the necessary goods and services the government of Kerala reached out to the people through its vast network of the local self government representatives, Kudumbasree, and the volunteers corps.

The Labour Department was pressed into essential service from 27/3/2020 onwards. Labour Commissioner has issued circulars directing the employers that no amount of salary/wage of the workers shall be deducted on absence from duty during the period of lockdown and no worker shall be removed

from the job as a result of lockdown. Also, instructions were issued directing the strict adherence to the prevailing health advisory protocol and to provide PPEs to employees and to avoid unfair labour practices and strikes so as to maintain a good atmosphere in the industries. About 4, 34000 guest workers in the State were shifted to 21556 relief camps with bedding and basic facilities and necessary facilities to keep social distancing and adequate safety measures were taken. During the lock down period Rs.2 Crore was specifically ear marked for meeting the covid preventive activities, The camps were run from 24.03.2020 to 01.06.2020.

Data/information of guest workers sheltered in camps were collected. Details of Stranded workmen as well as details such as their provision of food materials, workers social, psycho needs, and recreation facilities were also ensured through the field level data collection & data monitoring. The department started helpline/call centers in all districts and along with the Labour Commissionerate call center, working 24x7 to address the grievance of the guest workers. Willingness of the guest workers (camp inmates) to return to their native was collected and more than 3 lakh guest workers were transported to their respective domicile state. The workers coming through employers/agents/contractors are being provided with quarantine facility by the employers/agents/contractors. In the case of workers who are coming in Kerala without employers/agents/contractor, the quarantine facility is being provided by the district administration. With the help of Labour Department after quarantine, works are guaranteed in construction sector, plantation sector, fish peeling sector & service sector. In pursuance of unlock period, for the benefit of the guest workers who have been staying back & have started engaging in gainful employment, Labour department in corporation with Civil Supplies department & Supplyco is currently distributing 10 kg rice & 2 kg pulses under the ATMA NIRBHAR BHARAT initiative.

The response to the pandemic has taken away jobs, has reduced income and livelihood sources. The protection to these basic contents of worklife must be the core concern of a state that is duty bound to protect the rights of the citizen. Kerala government had taken measures to protect the workers through its various measures against lay offs, wage payments etc as mentioned earlier. However ingrained in these measures was the graded approach to a labour hierarchy.

The sections are based on the background paper prepared by Vinoj Abraham, the Labour Department.

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CHAPTER 9

LEARNINGS FROM DISASTER: THE KERALA EXPERIENCE

T. Jayaraman

In the last four and a half years, the State of Kerala under the leadership of its Chief Minister, Shri Pinarayi Vijayan, has completely reset the benchmarks and raised the bar decisively for the standard of disaster governance in India, contributing decisively to the global understanding of disaster management. Every year of this government's term in office after the first has been marked by at least one notable disaster of natural origin. All of them, while of a different kind each year, have been significant in scale. However, with every such challenge, Kerala society, under its current political leadership, has risen to the occasion in a manner that has become not only been commended both nationally and globally, but has also drawn serious scholarship and enquiry into the nature of this success by experts, officials and government leaders from all over the world. Kerala society's response to the disasters has drawn the attention and appreciation of democratic and progressive public opinion, attention that is also reflected in the ample and sustained media interest in Kerala in this regard.

A full account of this period and its disasters, and the manner of its management is not possible in the brief space available to us in this volume. Such an account would have to begin with the State's worst drought of a century in 2017, take into account Cyclone Ockhi later in the same year, the Nipah virus outbreak of 2018 summer, the record floods and landslide in 2018, followed by a similar situation in 2019, though not of the same scale and extent, culminating in the COVID19 pandemic of 2020, that is still ongoing, though perhaps the arrival of vaccines shows some light at the end of a long tunnel. Clearly all of this cannot be examined in detail here, though the pandemic and its response deserves a separate account that is presented elsewhere in this volume. What we will concentrate on is to provide first some contextualization of Kerala's disaster management structures and experience with reference to the global and national scene. While providing some pointers to the reasons for Kerala's successes in disaster management, we will also briefly indicate the important issues that face the State in the future with respect to not only the management of disasters, but also the all-important question of disaster risk mitigation.

Introduction and Background:

Disasters are known to humanity since its origins. Natural hazards, or extreme climatic and geophysical events are intrinsic to Nature. But it is their impact on human society that transform extreme geophysical events of natural origins into a disaster. Despite their ubiquity in history, disasters have emerged as a serious field of study in theory and practice only in the second half of the last century. By the end of the twentieth century, disaster management became a subject of increasing concern and attention across the world.

The global community took note of disasters through the multilateral processes of the United Nations with a series of UN sponsored collaborative and cooperative initiatives beginning in the last decades of the twentieth century. The decade 1990-1999 was marked as the International Decade for Natural Disaster Reduction. Following this, the global community moved to formulating and recognizing an International Strategy for Disaster Risk Reduction (ISDR), whose implementation as a movement across the world was sought to be coordinated and facilitated through a Secretariat, the UNISDR. The UNISDR promoted the implementation of the Hyogo Framework for Action 2005-2015 for international cooperation in disaster reduction, an outcome of the Second World Conference on Disaster Reduction held at Kobe, Japan in 2005. Subsequently renamed the United Nations Office for International Disaster Risk Reduction (UNDRR) it oversees the implementation of the next generation of international cooperation in disaster management based on the Sendai Framework for Disaster Risk Reduction, adopted by the Third World Conference on Disaster Risk Reduction in 2015 at Sendai, Japan. Together with rising global preoccupation with environmental questions and issues, especially related to biodiversity and climate change, the importance of disaster risk reduction and disaster management have only become increasingly a key concern of the global community.

The increasing recognition of the importance of disasters as a fundamental part of the international agenda of sustainable development have also had their echo at the national level with increasing attention devoted to disaster management and its formalization within the work of government in India, at the national level and in the States. Managing disasters had of course always been a major concern of government, and especially the purview of the revenue, police and fire service departments. Command and control measures in immediate disaster management, especially on a larger scale, led at Ministerial level, either by the Prime Minister or Home Minister at the Centre, or by the Chief Minister at the State level, were also an integral part of disaster governance. However, such approaches lacked the necessary force for dealing with the increasing need for co-ordination in disaster management as well as integrating disaster risk reduction into the very process of development itself.

The most important landmark in the evolution of disaster governance in India has of course been the passage of the National Disaster Management Act, 2005, and the establishment of a framework for disaster management through the National Disaster Management Authority (NDMA) and corresponding bodies at the State level (State Disaster Management Authority (SDMA)), extending to even District Disaster Management Authorities (DDMAs) in all districts in the country. The subsequent evolution of these disaster management authorities has been driven primarily by their need to cope with a number of disasters that have occurred in the country since then.

The structure of disaster governance has also been complemented by the evolution of national disaster finance, through changes undertaken in the background of the passage of the National Disaster Management Act, as well as the successive recommendations and guidelines of the various Finance Commissions that have since followed. Since 2010, the structure of disaster relief and rehabilitation finance is through the National Disaster Relief Fund (NDRF) and State Disaster Relief Funds (SDRFs). As noted in the authoritative Arthapedia.in, the financial assistance from SDRF/NDRF is for providing immediate relief and is not compensation for loss/damage to properties /crops. In other words, NDRF amount can be spent only towards meeting the expenses for emergency response, relief and rehabilitation. For projects exclusively

for the purpose of mitigation, i.e, measures aimed at reducing the risk, impact or effect of a disaster or threatening disaster situation a separate fund called National Disaster Mitigation Fund has to be constituted. This fund has still to come into existence and the Govt of India has recently been of the view that existing programmes and schemes are adequate to take care of such disaster mitigation needs and that no separate fund is necessary. The hitherto existing National Calamity Contingency Fund (NCCF) was renamed as National Disaster Response Fund (NDRF) on 28 September 2010 with the enactment of the Disaster Management Act in 2005 and consequent changes in the design and structure of disaster management in India. The National Executive Committee (NEC) of the National Disaster Management Authority takes decisions on the expenses from National Disaster Response Fund, in accordance with the guidelines laid down by the Central Government in consultation with the National Authority.

Kerala has been in the forefront in active participation in the evolution of disaster management in the country. With an active SDMA, aware of its functions and utilized by the government, alongside the other administrative and technical arms of government, the institutional structure of disaster management in Kerala has undoubtedly made progress over the years. It may be added though that it has rarely been put to the test as in the last few years, while its overall performance previously did not excite particular attention. However, it is the strengths of Kerala's society and polity, that have provided the flesh, blood and muscle over the bare skeleton of institutional structures that has distinguished Kerala's disaster response in the last four years.

The Kerala "Model" of Participatory Disaster Management:

A key feature of the modern approach to global and national initiatives in disaster management is of course the emphasis on the importance of the participation by all sections of society in coping with and managing disasters, especially large-scale disasters. It is in this respect, in participatory disaster management, that Kerala has managed to decisively come ahead of other comparable experiences both nationally and globally. Kerala's long record of increasing citizen awareness of governance and the increasing desire of the common people for a participatory role in the same has been dealt with in substantial manner elsewhere in this volume. But nowhere has the advance registered by Kerala in local government and the progressive decentralization of governance manifested itself as decisively as in the case of recent disaster management.

Decentralisation and participatory governance cannot however function by themselves. Especially when disasters occur, a strong degree of command and control is also essential, particularly in situations of resource scarcity so common in developing societies. Balancing the two or developing a proper synergy between the dimension of participation and decentralisation on the one hand, and that of command and control on the other, by a wise political leadership is critical and clearly this has been another ingredient of Kerala's success.

Kerala's human development advance and its network of social welfare and social safety arrangements have also been important ingredients to Kerala's success in disaster management. All the structures, institutions and arrangements in the social welfare sector could be rapidly brought to bear on relief and rehabilitation. In the case of the COVID19 pandemic, particular mention must be made of course of the advance of the public health system and its structure in the State.

Where arrangements and improvisations had to be made on the fly, government and society proved more than equal to the task, and lacunae when they occurred could soon be set right. Kerala society has demonstrated a remarkable capacity for innovation, from local social innovations, to innovative government response as well as technological innovations, especially using information technology, the latter brought to bear by a new generation of young Keralites both at home and among the diaspora.

Important mention must also be made of how communication worked effectively both horizontally and vertically across society. Rarely has the country seen a Chief Minister and his Ministers and senior most officials communicate in such steady and calm fashion, not hiding or shielding from view the depth of the crisis from the public eye, but yet communicating across to officials, civil society and the population what the state of affairs was and what needed to be done. While this has come to global attention during the COVID19 pandemic, with many other leaders following similar strategies, this was a strategy perfected earlier by Shri Pinarayi Vijayan and his government, in the face of other disasters as well. Horizontally too, communication in Kerala was rapid and effective, most notably seen in the vast mobilization of assistance and relief within and outside Kerala, during the floods, handled by networks spanning all of society that were formed spontaneously and worked effectively. Communication has on the whole worked effectively during the pandemic as well, though the novel and intense nature of the challenge has proved trying to all societies across the world, irrespective of their level of development.

The points made above need to be emphasised first because they not only provide valuable lessons to the rest of the country, but also because a rational account of the strengths of Kerala society is important to going ahead, staying aware of the need to ensure the continued sustainability of these positive features and characteristics. At the same time, there is no doubt room for improvement and advance, and a serious account of how even Kerala's strengths functioned across different regions and social and economic strata needs to be developed, while noting whether, despite the overall positive performance, there were pockets of marginality and exclusion to which attention needs to be paid in the future.

The Challenge for the Future: Scientific Disaster Risk Mitigation

Kerala's challenges for the future in disaster management may perhaps be summed up succinctly in the term scientific disaster risk mitigation. The scope and scale of the disasters that the State has faced were no doubt in part determined by the severity of the climatic or biological extreme events that triggered them. However, the lack of disaster risk awareness compounding the relative lack of mitigation, based on sound scientific and technological principles, has been brought out starkly during the floods and landslides of 2018 and 2019. The presence of human activities and permanent structures in the flood plains of various waterways is only the tip of the iceberg of a general need for consistent disaster risk mitigation. The occurrence of landslides provides other such examples.

The role of science and technology in disaster risk awareness and mitigation is essential on several counts. One is of course the obvious short-term one of providing sound principles for determining when people are potentially in harm's way and ensuring that they are either protected adequately or taken out of the way of oncoming danger. The second and more challenging aspect, in a scientific sense, is determining the nature of potential harm as an ongoing and dynamic question, that can change both with continued development as well as the

potentially serious impact of climate change. Dealing with the latter particularly involves the intersection of natural sciences and technology on the one hand with economic and social dynamics on the other.

Regrettably, on both these aspects, the argument that no development at all, or only minimal development, is the solution, is one that is heard frequently. This clearly cannot be valid in a country and a State where significant development deficits, especially in generating employment and livelihoods, based on productive activity, have to be overcome. Science and technology are indispensable to not only locating danger but also the solutions to disaster risk mitigation. A typical example of such arguments centres around the opposition to so-called "linear" development, a euphemism for roads, railway lines, electricity transmissions lines, oil and gas pipelines and the like. Unfortunately a modern State with a modern economy cannot be built with transportation infrastructure that is so weak that it takes hours to traverse one to two hundred kilometres. At the same time, instances repeatedly come to light of road construction in difficult terrain that skirt or altogether ignore basic rules of safe road construction.

A number of specific scientific and technological questions need to be studied with reference to the specific features of disasters in Kerala. Floods and landslides are two features that need urgent remedies. The landslides of 2019 in particular point to surprising landslide proneness in zones which were not previously considered highly vulnerable and evidently both short-term and long-term studies are needed to deal with this problem. Coastal erosion is another serious challenge for Kerala, though it manifests as a slow-moving disaster rather than a sudden shock. The continuing challenge of coastal erosion, despite several decades of effort and the lively public debate on the issue in the State, suggests that there are key gaps in our knowledge of the processes and mechanisms that lead to such erosion. The current status quo also suggests that serious scientific effort ranging from data gathering in a much more intensive manner, to more innovative and creative approaches to understanding the particular features of such processes along the Kerala coast is called for.

Such studies need to involve closely not only experts but also the senior engineers and scientists in government departments on whom falls the burden of turning these scientific outputs into engineering realities. Without critical awareness of disaster risk mitigation in the day-to-day engineering of both government and the private sector, proposed solutions are unlikely to be implemented.

There is ample scope for closely involving the academic and science, technology and engineering communities of Kerala for working on such problems. While such involvement may need serious efforts and training, further education and general capacity-building it will provide ownership to the proposed solutions that will be lacking when proposed by outside experts working in relative isolation with only basic consultation with the local stakeholders. Expertise and inputs could also be sought on a global basis for assistance in developing local expertise and relevant solutions. Such expertise from outside Kerala is also essential to ensure that the scientific study of disasters in the State is not only carried out, but done so with serious attention to enhancing the level of scientific rigour and accessing the best available knowledge on a global scale. It is essential that some key themes in Kerala's needs in disaster management could be dealt with in a scientific mission or task force mode in the immediate future.

Scientific disaster risk mitigation is also essential for avoiding the enormous economic losses that follow such disasters. While participatory disaster management can help save lives and provide relief and rehabilitation with dignity, this alone cannot avoid the economic losses that follow. Kerala's economy has notably suffered from the two successive years of flood and landslides while recovery has been seriously hampered by the onset of the pandemic in the very next year. In the face of political headwinds that make resource mobilisation by the State government difficult and the general difficulties associated with State finances (both dealt with elsewhere in this volume), the minimisation of disaster related losses is essential.

The urging of scientific disaster risk mitigation should not be construed as suggesting that science and technology considerations would provide unique and deterministic solutions. In complex real world problems with multiple factors in play, solutions are quite unlikely to be unique though there may be some common features. The choice between such solutions need to be also guided by considerations of economic, financial and social factors keeping in mind the need for equitable sharing of any burden on sections of the population. Solutions to real world problems also will need some learning by doing and the need to experiment with different innovative approaches to determine which provide the best sustainable alternatives.

Last but not least, the social and economic fault lines in society and their manifestation in politics and political decision making, are most evident in post-disaster recovery and rebuilding. Across the world, it has often been the experience that all too soon the unity and sense of unified purpose that facing the disaster evoked may dissipate, giving way to fractious debate and a scramble for coming out ahead in the race to recovery. There is regrettably no easy formula to deal with this political question that is as dependent on the correlation of political forces in society as in any other matter and, as always, it is the vigilance of democratic and progressive political opinion that keeps society on track. However, scientific soundness and rigour in the formulation of recovery, does provide an important reference point for dealing with such debates in the post-disaster recovery era.

To conclude this section, there are no doubt a number of specific dimensions of disasters that we have not made mention of in the preceding pages. However, we believe that the issues we have raised go to the heart of the problem and provide the foundation for further considerations of how to build a disaster-resilient Kerala.

Floods and Landslides of 2018/2019: Notes from the Kerala State Planning Board

In what follows in this brief chapter, we present two specific illustrations of the issues raised here in this note, both drawn from the flood and landslide disasters of 2018 and 2019. In the first of these we reproduce the analysis of the floods and landslides of 2018 that appeared in the Economic Review of 2018. With the recurrence of the floods in 2019, the Kerala State Planning Board commissioned a study headed by the Executive Vice-President of the Kerala Council for Science and Technology, a distinguished hydrologist with a team of experts from within and outside the State of Kerala. The executive summary of the study, though the study was a short-term one, demonstrates the kind of scientific input that is needed, though on a much more comprehensive and thorough-going scale.

The Floods of 2018

The State has 1,564 villages, out of which 80 per cent (1,259) were affected by the floods of 2018. Out of the State's total population of 3.48 crore, more than 54 lakh people, about a sixth of its population, were directly affected by this deluge. Approximately 14 lakh people were displaced. The floods damaged 1,74,500 buildings.¹

Seven districts, Alappuzha, Ernakulam, Idukki, Kottayam, Pathanamthitta, Thrissur, and Wayanad, were the worst affected. Because of floods and landslides, 433 lives were lost. Of these 268 (62 per cent) were men, 98 (23 per cent) women and 67 (15 per cent) children (PDNA 2018 p. 13).

According to the Indian Meteorological Department (IMD), Kerala received 2,515.7 mm of rain in the southwest monsoon (June- September, 2018), which was 23.34 per cent higher than the normal rainfall of 2,039.6 mm. But the critical aspect was the heavy rainfall starting from August 8, which became a 3 day long extremely heavy rainfall from August 15 to 17, 2018. In 1924, the highest rainfall was recorded at Munnar, where there was 897mm rainfall in 3 days (16-18 July 1924). In 2018 Peermade had the highest rainfall, with 818 mm rainfall in 3 days (August 15 to 17, 2018.). This type of rainfall events are in the one in 500- year class, according to the Probable Maximum Precipitation (PMP) Atlas of Central Water Commission (CWC). This 3-day rainstorm value is 40 per cent of the long-term average rainfall for entire southwest monsoon. Such extreme rainfall events naturally lead to extreme floods.

The CWC (2018) has observed: “Kerala experienced an abnormally high rainfall from 1 June 2018 to 19 August 2018. This resulted in severe flooding in 13 out of 14 Districts in the State. As per IMD data, Kerala received 2,346.6 mm of rainfall from June 1, 2018 to August 19, 2018 compared to an expected 1,649.5 mm of rainfall. This rainfall was about 42 per cent above the normal. Further, the rainfall over Kerala during June, July and 1st to 19th of August was 15 per cent, 18 per cent and 164 per cent respectively, above normal.”

A careful examination of the available data shows that in fact the Flood of 2018 was less intense than the Flood of 1924 in terms of the rainfall leading to the floods.

Spells of MONSOON RAINFALL – EvOLVING TrENDS

Scientific studies (Box 12.1) have shown an increase in extreme and very heavy rainfall spells during the southwest monsoon in the last 50 years. Waghlikar, *et al* (2015), analysing pre-monsoon, monsoon and post-monsoon rainfall trends in various parts of India has found that during the period 1951-2011, there is a decreasing trend in pre-southwest monsoon rainfall and an increasing trend in post-southwest monsoon rainfall in Kerala. The trend, however, is different across various regions in the country.

Study by Kothawale and Rajeevan (2017) finds that out of eighteen subdivisions in India, the mean seasonal rainfall based on the period 1981-2016 is significantly reduced from mean seasonal rainfall for the period 1871-1980 over seven subdivisions. The reduction for Kerala is statistically significant at 10 per cent level. For, India as whole, mean monsoon season rainfall for the period 1871-1980 and 1981-2016 are

854.1 mm and 830.1 mm respectively. Though the recent period mean seasonal rainfall has

decreased by 24 mm from the mean rainfall based on the period 1871-1980, the change in mean rainfall is not statistically significant.

The causes of the extremely heavy rainfall of 2018 in Kerala clearly need deeper scientific analysis. It is noteworthy that the Inter- Governmental Panel on Climatic Change (IPCC 2018) has stated that rise in global temperatures by 1.5 degree celsius would increase the frequency of heavy precipitation due to rise in intensity of tropical cyclones. This underscores the importance of learning to cope with rainfall extremes and their consequences.

It is clear therefore that the proximate cause of the floods of 2018 in Kerala was the extremely heavy rainfall in August 2018, especially between August 15 and 17, 2018. The CWC (2018), has affirmed this and emphasised that the opening of dams had minimal or no impact on the runoff of water. Kerala has 57 large dams with a total storage capacity of 5.806 Billion Cubic Meter (BCM), which is equal to 7.4 per cent of the annual average runoff of all 44 rivers in Kerala. Only seven reservoirs have a live storage capacity of more than 0.20 BCM (*ibid.*).

“It may be noted that a flood peak of about 8,800 cumec was observed at Neeleswaram Gauging & Discharge site. That means apart from a release of about 1,500 cumec from Idukki reservoir, the flood peak generated in the downstream free catchment was of the order of about 7,300 cumec. Even if there was no or very little release from Idukki reservoir (a hypothetical situation in the wake of floods of such magnitude), the downstream areas would still have received a peak of about 7,500-8,000 cumec. Therefore, it can be concluded that Idukki reservoir’s contribution to the overall flooding situation downstream was miniscule. It had, in fact, provided an attenuation of flood peak by about 1,030 cumec² when peak inflow impinged the reservoir” (ibid. p.12).

² The peak inflow into the Idukki dam was 2,532 cumec at 22:00 hours on August 15, 2018. The corresponding release from the dam was 1,614 cumec (1,500 cumec spill + 114 cumec power house release). According to the CWC report, the peak was attenuated from 2,532 cumec to 1,500 cumec, an attenuation of 1,030 cumec. (CWC 2018, p.11).

Box 12.1 Trends in southwest monsoon, extreme events

The seasonal mean rainfall, examined over central India and the Western Ghats regions, shows a decreasing trend from 1951 to 2004. Seasonal rainfall decreased by about 1–1.2 mm per day in this period. However, there is an increasing trend in the variance of daily rainfall during the monsoon season. The light to moderate rainfall events ($5 \leq \text{rainfall} < 100$ mm per day) have decreased while heavy and very heavy rainfall events ($\text{rainfall} \geq 100$ mm per day) have increased in both the regions during this period. The decline in light to moderate rainfall events has more than offset the rise in heavy and extreme events, leading to an overall decreasing trend in seasonal mean rainfall between 1951 and 2004.

Source: Extreme Events and Trends in the Indian Summer Monsoon, V Krishnamoorthy, Centre for Ocean-Land-Atmosphere (COLA) Studies, Technical Report, available on ftp://cola.gmu.edu/pub/ctr/CTR314_ms.pdf

The statement of Dr K J Ramesh, Director General of Indian Meteorological Department (IMD) is noteworthy in this context. “The frequency of daily rainfall up to 10-15 cm has significantly increased since 1947, while the intensity of low rainfall of up to 5 cm has decreased in India. This has happened because of global warming. Significant changes have also been observed in the frequency of cyclones and hurricanes across the world. At the global level, 10 cyclones used to be recorded on an average. Now their average number has increased to 18 in a year. Though the frequency of cyclones in India has not increased in the Bay of Bengal or the Arabian Sea, their intensity has definitely increased...”

Source: www.ndtv.com. This is an excerpt from the exclusive interview given to NDTV on November 24, 2018 by the Director General, IMD

Disaster Response – Collective, Swift AND Effective

There was swift response from the Government, which mobilised a) 4,100 personnel and entire equipment from Kerala Fire and Rescue Services

b) 58 teams and 207 boats from National Disaster Response Force (NDRF), c) 23 columns and 104 boats from Army, d) 94 rescue teams, one medical team, 9 helicopters, two fixed-wing aircraft's and 94 boats, e) 36 teams, 49 boats, 2 helicopters, two fixed-wing and 27 hired boats, f) 22 helicopters and 23 fixed-wing aircraft from the Air Force, g) 2 companies and 1 water vehicle team of Border Security Force and h) 10 teams of Central Reserve Police Force.

The State of Kerala – its Government and people – demonstrated exceptional capability in undertaking immediate rescue and relief work during the crisis. Kerala,

once again, led by example, that is, of widespread and selfless public action by the Government and citizens. The speedy, meticulous, and people-oriented handling of the crisis by the State has won admiration from all over the State – and from other parts of India and the world.

Special mention must be made to the role of the fish workers, who went into action even at considerable personal risk. 669 boats with 4,537 fishermen rescued about 65,000 people. Special efforts were taken by the Government for addressing the needs of those who lost certificates and documents in the floods.

There was a display of unity and courage in society, and young people and students took lead in relief and rescue operations. Financial and physical contributions (for cleaning flood- affected houses and buildings) were made by all sections of society. The determination and the willpower of our society have received international commendation.

The Chief Minister's Disaster Relief Fund (CMDRF) has received contributions amounting to

Box 12.2 Dams and floods, findings by researchers

The devastation wrought by the Kerala floods of August cannot be attributed to the release of water from dams, says a computer simulation of flood storage and flow patterns by a team of researchers. Scientists from the Indian Institute of Technology-Madras and the Purdue University, United States, say that the odds of such floods were “0.06 per cent” and no reservoir management could have considered such scenarios. Previous analyses of the Kerala floods had not incorporated a simulation of water flows and had relied solely on measurements of water levels at dam sites, according to the authors of the study. Kerala has 39 major dams and they are maintained by the Kerala State Electricity Board and the Water Resources Department.

All 39 dams in the State reached full reservoir level by the end of July, and were incapable of absorbing the torrential volumes of rain in August, leaving dam-managers with no choice but to release water. The scientists analysed different scenarios with combinations of reservoir storages (85 per cent, 75 per cent, etc.) at different time periods (end of June and end of July), along with different soil moisture conditions, which have a bearing on river flows.

What they found was that in the hypothetical scenario that there were no dams in the Pamba River Basin (PRB), the “peak discharge” at locations downstream of the Idukki reservoir would have been “reduced by 31 per cent.” This, however, wasn’t a reduction enough to have prevented the inundation, according to the researchers.

“The major share of the total flood flow was by Perinjankutty (3,500 m³/s), which is a near uncontrolled tributary, while the 14 controlled releases from Idukki had contributed only 1,860 m³/s... the results indicated that the role of releases from the major reservoirs in the PRB to cause the flood havoc was less,” the authors say in the study, which is to be published in a forthcoming issue of the peer-reviewed Current Science.

Source: From The Hindu, 22 November, 2018

₹2,987.48 crore by the end of November 2018. The total amount collected through the “salary challenge” was ₹488 crore. The number of Government employees

in Kerala who participated in the challenge was 2,27,338, a 57 per cent of all employees. (*Source*: Proceedings of the Legislative Assembly).

The Government established 12,253 relief camps, which provided shelter to 34,15,937 affected people. Over 10 lakh people were evacuated and over 33,000 were rescued. The Government provided immediate relief of ₹10,000 each to 6.87 lakh families and made psychological counselling services available to 40,000 flood victims by December 2018. Monetary assistance for those who are affected by crop losses has also been

announced.

Out of the 2,43,690 partially damaged houses, owners of 48,381 houses which had sustained at least 15 per cent damage were paid ₹10,000. In addition to this 8,469 house owners whose houses had suffered 16-29 per cent damage were given ₹60,000. Owners of 155 houses which had been damaged in the range of 30-59 per cent have received the first instalment of ₹1,25,000. Households which were substantially damaged, that is, in the range of 60-74 per cent have been paid ₹2,50,000 as the first instalment. The Government is working towards completing the payment to all house owners whose dwellings suffered damage in the floods in the shortest possible time.

Box 12.3 Role of Kudumbashree during floods, 2018

During the floods of July-August, 2018, Kudumbashree helped to give leadership to women in organising relief and rehabilitation operations. Kudumbashree undertook a range of activities, including providing temporary shelter for affected people, gathering food and other materials for relief camps, counselling to ameliorate mental stress, especially of women and children, and packing ‘take home kits’ in affected districts. Kudumbashree members also participated in cleaning of houses and public places. More than 4 lakh volunteers participated in the cleaning campaign. Community kitchens were started in flood-affected areas for those who returned from relief camps. Kudumbashree State Mission teams consisting of State programme managers and assistant programme managers visited the most flood and landslide affected districts in the State. A sum of ₹7 crore was handed over to CMDRF on August 29, 2018. Most of these amount was mobilised from weekly thrift collections by Neighbourhood Group members. Kudumbashree is the nodal

Source: Flood Relief Activities, Kudumbashree, 2018

Damage Due to Floods - AN Overview

The damage to various sectors of Kerala’s economy has been heavy and has been estimated at ₹31,000 crore by the Post Disaster Needs Assessment (PDNA) of the UNDP. The damage caused to infrastructural sectors such as power and transport, other economic sectors, and social sectors have been separately assessed in the PDNA. (Table 12.1).

Low-lying areas of Kuttanad, and the uplands of Idukki and Wayanad were severely affected by floods and landslides. Low-income groups who reside in these areas will have a special place in post-flood rehabilitation.

Flood and landslide-related losses put an

additional strain on State finances, already facing stress because of the burden of committed expenditure and lower-than-expected growth rate of revenues. To overcome the additional fiscal responsibility, the State has requested the Centre for a temporary relaxation of the borrowing limit to 4.5 per cent from the present

3 per cent of GSDP. The State has suggested imposing a cess on GST for a specific period (which is permissible under Article 279A(4) (f) of the Constitution) for additional resource mobilisation. This proposal has been accepted by the GST Council in January 2017. The State has submitted a memorandum to the Centre requesting for a grant of ₹4,796.35 crore as per SDRF norms. As already stated the PDNA conducted by the UNDP estimates the loss suffered by the State as ₹31,000 crore. This works out to approximately 5.02 per cent of 2016-17

Table 12.1 Estimation of damage consequent to floods, 2018,
in ₹ crore

Sector	Damage	Losses	Damage + Losses	Total Recovery Needs
Social	5,743	1,448	7,191	6,337
Productive	2,975	4,180	7,154	4,498
Cross cutting	10,561	16,159	26,718	30,715

Source: Post Disaster Needs Assessment Report, 2018

Students and teachers of educational institutions played a commendable role in relief and rehabilitation work. The study conducted by the students and faculty of John Mathai Centre (Department of Economics, University of Calicut) in Kadavarampuramboke settlement near Arnattukara church in Thrissur District highlighted the special problems faced by the local population who had no land of their own. Teachers and students of Sanskrit General Department of Sree Sankaracharya University of Sanskrit, Kalady, conducted a medical camp for persons affected by floods with the support of Kottakkal Arya Vaidya Sala's Swanthwanasparsham programme. Besides, schools, higher education institutions including government, aided and autonomous colleges (like St. Teresa's College, Ernakulam) conducted long duration camps for the flood affected. There are many more such initiatives undertaken by civil society groups.

Box 12.4 Post-flood scenario: initiatives by university students and teachers

Source: District Livelihood Rehabilitation Credit Plan, Thrissur, 2018; Deccan Chronicle, September 15, 2018.

GSDP at current prices (₹6,17,035 crore). These losses to the State economy would adversely affect the revenues when the State is faced with substantial additional expenditure burden of post-flood reconstruction. This situation demands urgent and liberal help from the Centre and all sections of society.

REALISING a RESILIENT Kerala

Building a Resilient Kerala needs to be based on science and on people's participation. Modern science and technology must inform all stages of the process of dealing with natural disasters, that is, from early warning systems, relief operations, design and construction of buildings and community infrastructure, individual care and livelihood enhancement measures. The needs of the elderly, people with disabilities in rescue operations and that of women (who play a cardinal role in pre and post-disaster stages) in livelihood opportunities are to be addressed. The conditions of migrant workers also need special attention.

The steps towards realising a new and resilient Kerala include efforts to strengthen and advance planned economic development as envisaged in the 13th Five-Year Plan, to implement a new livelihood package and to "build back better". Ongoing schemes under the Annual Plan 2018- 19 were reoriented to deal with the exigencies of

the flood. It was also envisaged that the Annual Plan 2019-20 would support rehabilitation, and the restoration and creation of livelihood opportunities for the people of the State.

A two-day Conference was held in Thiruvananthapuram on November 1-2, 2018 by the Kerala State Planning Board to discuss post-disaster livelihood revival options. This included exploring options with regard to wage employment, self-employment and skill development. The livelihood development package includes livelihood schemes in the Annual Plan, a livelihood credit rehabilitation package, projects under MGNREGA, Kudumbashree and Local Governments, and options under other Centrally Sponsored Schemes.

The next task of building back better is sought to be realised through the The Rebuild Kerala Initiative (RKI). This is to be a multi-sector programme involving several Government departments and agencies over a period that may vary from 2 to 3 years. The outline of the institutional framework proposed for RKI comprises the Council of Ministers, an Advisory Council, High Level Empowered Committee, RKI Implementation Committee (RKI-IC), RKI Secretariat, and institutional support.

Box 12.5 Co-operative alliance to rebuild Kerala, CARE
Kerala

The project is being implemented by the Department of Co-operation. It envisages building 1,500 houses for families whose houses have been completely destroyed by the 2018 floods. The project cost is ₹75 crore, with financial assistance of ₹5 lakh per house. The primary co-operative societies or other co-operative societies with a strong presence in a locality will take up the responsibility of constructing the houses. The local situation, land terrain and availability, and the needs of the beneficiaries and their financial capacity are to be factored in while making the plan and estimate for the houses. The services of engineering experts and engineering students would be utilised for this purpose. The construction of the houses is to be completed within 3 months of commencement of the work. The minimum area of a house is to be 600 sq. feet. For the houses being constructed, stability, resilience to environmental challenges, basic facilities such as drinking water, electricity and waste disposal mechanisms, clean surroundings, and a small garden will be ensured. The beneficiaries will be from the list provided by the District administration. The project envisages not only house construction but also the social rehabilitation of the families affected by the natural calamity. In order to achieve these, the services of social workers, teachers, and doctors will be made available through co-operative institutions.

FINANCING the Rebuild

Kerala has been facing fiscal stress since 2013-14 when the own tax revenue growth rate came down to around 10 per cent and the growth rate of revenue expenditure was 15-18 per cent. The State embarked upon a renewed fiscal consolidation path (from which there were substantial deviations in the earlier period from 2011-12) since 2016-17 by aiming at a higher growth rate of own tax revenue at 20 per cent and through measures to rationalise expenditure. But in all financial years after 2016-17, it was set back by policies beyond its control, such as demonetisation in 2016-17, implementation issues of GST in 2017-18, and unprecedented floods in 2018-19. Special efforts are needed to be initiated by the Centre to enable the State to finance the task of rebuilding Kerala.

The GoK has requested the Centre to a) enhance the borrowing limit in 2018-19 to 4.5 per cent instead of the present 3 per cent of the GSDP, b) levy a cess on GST for a specific period, which is permissible under Article 279A (f)(4) of the Constitution and c) provide additional assistance amounting to ₹ 820 crore and ₹ 4,794 crore for flood damage in July and August 2018. Besides, the State has implemented measures like Nava Kerala Lottery, strengthening the enforcement mechanism of tax collection and mobilising more non-tax revenue. Unless there is a positive response from the Centre, which is necessary in a system of cooperative federalism, the State will experience severe fiscal stress in the medium term.

The Path Ahead

Inclusive and people-centric approach needs to be in place from early warning systems, relief operations, design and construction of residential buildings, community infrastructure, psycho social interventions and livelihood enhancement measures. The concerns of the elderly, people with disabilities in rescue operations and that of women in livelihood opportunities are to be specifically addressed. Needs of migrant workers and others generally excluded should be specially taken care of.

Kerala which has effective decentralised governance can utilise the capabilities built so far through Peoples Plan campaign for taking up the challenge of building a new Kerala (Nava Keralam) leaving no one behind. The State has exhibited exemplary leadership and management skills, just as the people have come together for a historic effort of civic cooperation in the aftermath of the floods. This reminds of the lines of the poem by Clare Shaw on UK Floods of 2015, “The shifting of boulder, the bringing together of neighbour and stranger.”

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Executive Summary and Recommendations of the "COMMITTEE TO EXAMINE THE CAUSES OF REPEATED EXTREME HEAVY RAINFALL EVENTS, SUBSEQUENT FLOODS AND LANDSLIDES AND TO RECOMMEND APPROPRIATE POLICY RESPONSES"

The Kerala State experienced some of the most severe Extreme Rainfall Events (EREs) on record during August 2018 as well as in August 2019. These EREs caused extensive flooding (in most of the river basins) and landslides of high intensity in most districts of the State (specifically along the Western Ghats) resulting in severe damage to both the built and the natural ecosystem. While there were a lot of speculations, theories and scientific perspectives explaining the reasons for occurrence of these phenomena, a concrete and scientific validation was still lacking. These phenomena are a result of various factors ranging from the global climate change to local anthropogenic activities, and required to be investigated comprehensively by a team consisting of interdisciplinary experts. The Committee was entrusted to prepare a quick assessment report, after examining the causes of repeated extreme heavy rainfall events, and subsequent floods/landslides, and suggest recommendations to frame appropriate policy responses. Consequently, the Kerala State Planning Board, Government of Kerala constitute a technical committee. The Committee comprised of an interdisciplinary team of experts from Climate Science, Hydrology, Geology and Civil Engineering disciplines. The Committee was entrusted to prepare a quick assessment report, after examining the causes of repeated extreme heavy rainfall events, and subsequent floods/landslides, and suggest recommendations to frame appropriate policy responses. This document details the summary of the investigations, conclusions and recommendations by the Committee.

The State of Kerala is a narrow strip of land, in the southwestern margin of the Indian Peninsula. It lies between the Western Ghats (WG) in the east and the Arabian Sea in the west. The geographical area of the State is 38,863 square km. The State has a coastal stretch of about 580 km with a width varying from roughly 30 to 120 km. The physiographic profile of the State is classified into three distinct zones: the highlands (elevation > 75 m above mean sea level, and covering the steep and rugged sections of the WG), the lowlands (elevation < 7.5 m above mean sea level, and comprising of the coastal plains), and the midlands (consisting of the undulating hills and valleys) in between.

Kerala frequently experiences flooding and inundation across the low-lying coastal plains, floodplains and broad flat bottom valleys of the river systems and also landslides along with the steeply sloping segments of the Western Ghats. The NCESS has assessed the natural hazard proneness of the State. The assessment indicates that 14.52 per cent of the total geographic area (i.e., 5,643 square km) is prone to flood hazards, with varying proportions as high as 50 per cent for Alappuzha district. A total area of 1848 square km (4.71 per cent geographic area) in the State, extending along the steep slopes of the Western Ghats (i.e., mostly in Wayanad, Kozhikode, Malappuram Idukki, Kottayam and Pathanamthitta districts), is highly prone to the occurrence of landslides. Similar to floods, the occurrence of landslides in the State is mostly triggered by intense rainfall during the extreme rainfall events (EREs).

According to Census 2011, Kerala has a population of 3.3 crores. Kerala is ranked 8th in the population density (859 persons per square km) among the 28 states in India (Census of India, 2011). The distribution of population among the different physiographic units of the State does not show linearity with respect to the areal extent, as the population along the lowlands is much denser compared to the highlands and the midlands.

In August 2018, Kerala experienced two severe EREs, i.e., during August 8th to 9th and August 15th to 17th. According to the India Meteorological Department (IMD), Kerala received a total of 2346.6 mm rainfall from June 1, 2018 to August 19, 2018, which is roughly 42 per cent above the normal rainfall. The widespread flooding in August 2018 affected almost 5.4 million people – one-sixth of the State's population. Several districts were inundated for more than two weeks due to the floods. A total of 1,260 out of the 1,664 villages of Kerala were affected. About 341 major landslides were reported from ten districts, where Idukki district was ravaged by 143 landslides, causing a death toll about 104.

Kerala faced yet another ERE between August 7th and 9th, 2019. The State received 'large excess' rainfall to the extent of 123 per cent in August 2019 as compared to 96 per cent excess rainfall received in August 2018. There was 32 per cent deficit rainfall during the months of May, June, and July in 2019. In 2018, there was excess rainfall (8 per cent) during the same period. The antecedent high wetness condition prior to August in 2018 caused a higher level of flooding impact as compared to that in August 2019, which was at a relatively dry antecedent condition. The widespread flooding and landslides across the districts of northern Kerala in 2019 caused severe damage to both the manmade and natural ecosystems. The low-lying areas of the major river systems were inundated, and more than 2 lakh people were displaced. Kerala witnessed 80 landslides in eight districts over three days (August 8-11, 2019) and the death toll crossed 120.

The repeated EREs, and associated floods and landslides caused damage to infrastructure and resulted in the loss of lives and livelihoods. In the context of recurring EREs and associated damages due to flood and landslides, the

Kerala State Planning Board, Government of Kerala constituted a “Committee to examine the causes of repeated extreme heavy rainfall events, subsequent floods, and landslides, and to recommend appropriate policy responses” vide order G.O. (Rt) No. 42/2019/S&TD dated 22-08-2019. The Committee was entrusted to prepare a quick assessment report, after examining the causes of repeated extreme heavy rainfall events, and subsequent floods/landslides, and suggest recommendations to frame appropriate policy responses. The Committee comprised of an interdisciplinary team of experts from Climate Science, Hydrology, Geology and Civil Engineering disciplines.

The Committee addressed the following concerns while preparing the assessment report as per the terms of reference:

1. The reasons for the occurrence of such EREs and their major causative factors;
2. The capability and potential for accurate forecasting of such events with sufficient lead times;
3. Reviewing indicators and methods to locate areas prone to severe landslides during such EREs and remedial measures for minimising such hazards and their consequences;
4. Reviewing current maps of areas prone to flood hazard during such EREs and mitigation measures to minimise such hazards; and
5. To focus on the role of changing land use in these hazards

Methods of Assessment, Review, and Analysis

The Committee conducted field visits in several worst-affected areas (in 2018 and 2019) of floods and landslides in Pathanamthitta, Alappuzha, Kottayam, Malappuram, Kozhikode, Wayanad, Idukki and Kannur districts. The Committee also had several rounds of meetings and discussions with experts, officials, and the local community. The Committee addressed the set objectives on the basis of the survey of previous literature and ancillary information, observations during the field visits, interaction/discussion with scientific experts, administrators at different levels, and community.

The Committee used primary as well as secondary data (either observed or simulated or in combination) for detailed analysis. The daily rainfall data (recorded at meteorological stations and $0.25^\circ \times 0.25^\circ$ gridded data) of the India Meteorological Department (IMD) were used for the analysis of rainfall patterns and spatio-temporal trends across the State. The aerosol particle size distribution data, collected from Munnar Aerosol Observatory (established by IIT Madras) were used for the analysis of the effects of aerosols on EREs. The physical properties of the soil samples from the areas of landslide occurrences (collected by the National Institute of Technology, Kozhikode) were used for the numerical modelling of the landslides. Numerical analysis was performed to evaluate the factor of safety of slopes using Finite Element based Computer Program PLAXIS 2D (PLane strain and AXIal Symmetry). The gauge-discharge data, collected from the Water Resources Department, Government of Kerala, Kerala State Electricity Board (KSEB) Ltd., and Central Water Commission (CWC) through WRIS-India data repository were used for the hydrological analysis. The HEC-HMS, a watershed hydrological model was used to simulate the peak discharge for the actual condition as well as for different scenarios, and the HEC-RAS (2D), a hydrodynamic model was used for the development of flood inundation maps corresponding to different scenarios.

The Committee after detailed deliberations, analysis, and assessment arrived at the following conclusions and recommendations. It is envisaged that the recommendations of the Committee may help the Government to formulate appropriate policies for mitigating the negative impact of such devastating natural hazards in the future.

Conclusions

- The predominant reason for the occurrence of EREs in Kerala in the last two years (2018 and 2019) was the development of deep depression over the northwest Bay of Bengal and neighbourhood, coupled with the influence of the local orographic gradient on the atmospheric circulation, variability in monsoon circulation caused by the transient synoptic-scale and intra-seasonal propagating oscillations. It is to be noted that no noticeable teleconnections of EREs with El Nino Southern Oscillations (ENSO) and Indian Ocean Dipole (IOD) are observed.
- An analysis of the observed southwest monsoon rainfall during 1901-2018 in Kerala, in general, exhibited a decreasing trend over the northern half and along the coastal areas of the State. This observation was significant (at 95 per cent level) in isolated locations in northern parts of the State. The rainfall over the southern region of the State also showed a decreasing (but non-significant) trend. However, the data pertaining to the recent years (1971-2018), showed an increasing trend over most parts of the southern half and some interior areas of central parts of the State with isolated areas showing significant trends. A significant decreasing trend was observed over the northernmost areas of the State.
- There are a large number of predictive models being employed by various agencies across the globe for prediction of EREs, and many of them are being used by the IMD in the Indian context. However, they fail to capture the real mechanism of cloud formation and its impacts on rainfall distribution and pattern during the onset and occurrence of EREs.
- The triggering factor for the occurrence of landslides across Kerala during the EREs in August 2018 and 2019 was the oversaturation of the overburden. Idukki experienced the maximum number of landslides (977 including minor slides) in 2018, whereas Palakkad had the highest count in 2019 (18), followed by Malappuram (11), Wayanad (10) and Kozhikode (8). Generally, steep sloppy areas having slope more than 33 per cent are more vulnerable to landslide, and the majority of the landslides in the State during the last two years occurred in these terrains. The Committee noted that anthropogenic activities intended for agricultural expansion and water conservation such as terracing, blocking/diversion of stormwater channels and alteration of natural vegetation pattern have amplified the landslide susceptibility of these regions, especially at Kavalappara, Pathar and Puthumala. In addition, soil piping has acted as the triggering factor at a few locations, especially in Northern Kerala.
- The NCESS has prepared a landslide zonation map for Kerala in 2009 on a 1:50,000 scale. The landslides that occurred in the last two years have largely (~80 per cent) fallen in the high hazard zones delineated by the NCESS. There were a few slides in low hazard zones, while some of the high hazard zones were not at all affected during the EREs. This necessitates the inclusion of additional causative factors and refinement of the hazard zonation mapping. It should be performed on a fine resolution (preferably at the cadastral scale). This activity should be followed by the development of landslide risk maps at the cadastral level, which can be used for long term land use planning. The monitoring of ground movement may also be considered as part of long-term research activity.
- The EREs during the last two years were associated with the genesis of deep depression over the northwest Bay of Bengal and nearby areas. An early onset of monsoon along with a large amount of rainfall in June and July 2018 resulted in saturation of the topsoil in most areas. Most of the reservoirs in Kerala had to be filled near the Full Reservoir Level (FRL). The two EREs, subsequently in August 2018 (during August 8th to 10th, and August 14th to 19th), resulted in severe flooding in Kerala. A similar situation, except on the antecedent wetness condition (including reservoir storage), occurred again in August 2019 (during August 8th to 11th) and caused severe flooding in the northern districts of Kerala (north of Ernakulam).

- The floods experienced in the last two years have a large return period (more than 100 years), and the preparedness for such events was less due to their very low probability of occurrence.
- The Committee analysed flood inundation for various scenarios of different reservoir levels and 24-hour 100-year rainfall for the Periyar river basin and developed possible flood inundation maps. Such studies are essential for demarking the flood-prone areas under different conditions and have to be done over all the river basins in the State.
- The existing reservoirs in the State are conservation-oriented and are being operated as per the conditions specified in IS 7323:1994. Accordingly, the policy adopted being “no spilling of water over the spillways will normally be permitted in conservation point of view until the Full Reservoir Level (FRL) is reached. Flood cushion in the reservoirs is limited between the flood control zone, i.e., between FRL and Maximum Water Level (MWL). When any flood occurs, the policy to release the flood water is adhering to the principle that the releases shall not exceed the inflow into the reservoir”. Moreover, the reservoirs harvest water as much as possible to the full capacity during the rainy season. None of them had an operating policy that considered flood control until 2018. After 2018, some of the dams have considered flood control in their revised operation policy. This should be extended to all the reservoirs in the State. Further, the authorities concerned shall explore the possibility of providing some dynamic flood cushion in the conservation zone below FRL for all the reservoirs.
- The Committee recognised the need to define ERE. It was observed that the rainfall value corresponding to the 99th percentile for Kerala is around 120 mm (12 cm). Hence, 24-hr accumulated gridded rainfall ≥ 120 mm (rainfall of intensity equal to or more than the very heavy rainfall category) can be considered as an ERE.
- There are several natural and anthropogenic drivers of floods in Kerala, among which the prominent are: (1) high-intensity rainfall for prolonged duration, (2) human interventions in the catchment areas, and particularly in the floodplains and riparian zones, (3) unauthorised encroachments leading reduced extent of natural areas and their impaired functionality (4) reclamation of wetlands and lakes that acted as natural safeguards against floods due to urbanisation and development of infrastructure, (5) unexpected EREs and lack of exposure in handling such EREs through reservoir operation and (6) decreased channel capacity due to sedimentation and aquatic vegetation.

Recommendations to mitigate the negative impacts due to:

a) Extreme Rainfall Events

- The current rain gauge network in the State is not sufficient enough to capture the high spatial variability of rainfall because of the orographic barrier, and also in the context of the limited predictive capability of the rainfall forecast models. Therefore, the network density needs to be enhanced to the theoretical level of 1 rain gauge in every 50 square km (approximately 800 numbers). However, considering the varying spatial variability across the different physiographic regions of the State, it is suggested to install a dense network of Automatic Rain Gauges (ARG/AWS; ~ 500 numbers). Priority may be given to regions receiving high-intensity rainfall in short time periods including slopes that have the potential for flash floods. The distribution of the proposed rain gauges can be 50 per cent in the high lands, 35 per cent in the midlands, and the remaining 15 per cent in the low lands and coastal regions.
- It is suggested that a major share (~50 per cent) of the new installations should be Automatic Weather Stations (which can also monitor meteorological parameters such as temperature, pressure, wind direction, wind speed, and sunshine hours) and all of them be connected to a central location through telemetry. These observations would in the long run help to improve the predictive capabilities of the forecast models on a regional scale.

- The land acquisition for installation of new rain gauges, if required, be done in consultation with IMD and other departments in the State, and be completed at the earliest.
- Identify the rain gauges operated by other agencies in the State and link them to the centralised facility being proposed.
- Facilitate the development of the Regional ERE and Flood forecast system combined with Artificial Intelligence (AI) to predict flash floods and to trigger an advance warning through research studies or start-ups.
- The experts observed that there is a temporal change in the size distribution and circulation pattern of the dust aerosols in the State that have an impact on the changing rainfall patterns. However, this needs further research as it is an emerging area of research worldwide. The significance of forest fires across the WG on the aerosol concentration may also be considered.

b) Landslides

While the devastating landslides in the State during the last two years were primarily initiated by the EREs, the major reason for most of them was the instability of the slopes caused due to various anthropogenic activities. Therefore, preventive measures should certainly include slope stabilisation. The following are some of the possible remedial measures:

- Provide a vegetation cover to the degraded slope by either promoting natural vegetation growth or by planting suitable species that help slope stabilisation (example vetiver). The use of vetiver as a binder in laterite cutting is to be evaluated.
- In areas where clear-felling of trees was done, the deep tap roots should be removed and refilled with the earth. This is to avoid over saturation and decay of the taproot system which will lead to soil piping and landslides.
- In areas where plantation crops are planned, the selection of crops, as well as the soil pits for planting them, needs to be carefully chosen according to the package of practice. Unscientific use of machinery for pit formation may lead to increased disturbance of the overburden and cause additional water-holding, resulting in oversaturation.
- The following activities should be avoided so as to prevent the possibility of landslides:
 - Cutting and levelling for construction of houses on the toe region of slopes having more than 25 per cent inclination and a slope length exceeding 100 m.
 - Diversion or blocking of stream channels (up to third order) in the upper slopes especially above the settlement.
 - Ponding of water in the sloping sections over a 25 per cent slope.
 - Soil conservation practices through contour bunding, or terracing in slopes of more than 25 per cent.
 - Seasonal cultivation with tilling or pitting activity in the high sloping areas.
 - Any activity in those sections where either ground cracks or piping has been initiated.
 - Encroachment of stream banks in the highland region for cultivation or settlement.
 - Alignment of open irrigation channels on hill flanks with more than 25 per cent slope.
 - Construction of roads without adequate engineering design in the unstable slopes especially in those segments having higher soil thickness. The hollow portions are to be treated carefully.
 - Construction of dwelling units in the hollow portions which have been filled up with debris.
 - Construction of dwelling units on the immediate lower part of a sloping segment that is critically disposed of.
- The following activities can be promoted so as to prevent landslide occurrence:
 - Drainage of excess rainwater from steeper sections of slope through lined predefined channels.

- Afforestation/ tree crops with no tilling activity in such areas with more than 33 per cent slope.
- Maintenance of tree belts at suitable intervals in those slopes subjected to seasonal cultivation.
- Delineate stable and unstable areas in the uppermost catchments of drainage basins.
- Preservation of existing patches of natural forest cover.
- Permanent grass cover in extremely sloping sections (> 50 per cent slope).
- Land zonation at the micro watershed level involving the local community
- Create awareness among the local population regarding landslides.
- All drainage lines (of all orders) are to be maintained properly, especially during rains. The first and lower order streams get obliterated by agricultural practices such as contour bunding and terracing. These are the areas liable for failures during high rainfall times. The configuration of the basement rock will allow subsurface water to exhort high pore pressure in these areas, which are known as topographical hollows (places where lower-order streams are located). Therefore, before monsoon, all stream / nallas in the slopes need to be cleaned and opened up for the free flow of stormwater.
- Since the topographic hollows are the areas where the failure takes place, location of the hollows needs to be identified, and new houses/buildings to be allowed at least 50 m from either side of the stream channel / hollow area.
- The Government of Kerala should constitute a Committee to conduct in-depth studies and develop guidelines for best practices for allowing mining activities near topographic hollows. A “codebook” may be developed and strong regulatory system may be enforced. Stone quarries should not be allowed near the topographic hollows with more than 1 m overburden; they should be 200 m away from such localities.
- While constructing village roads in the high sloping areas, care should be taken to ensure the free flow of streams across the roads by providing culverts
- The current practice is that only the critical and high hazard areas are now regulated for activities. Settlements are allowed in the downslope of critical and high hazard areas. These areas are susceptible to high casualties during a landslide event. Therefore, an estimate of the runout distance for landslides needs to be assessed based on slope and overburden volume in the high hazard zones so as to regulate settlements at the downstream of the slopes.
- In many hill-road sections, toppling has occurred during rains where the road cuttings in the laterite are more than 3 m. This will cause disruptions in the traffic movement and destabilisation of the upper slope. Proper protection should be given to these laterite road cuttings with adequate weeping holes. In the unprotected slopes, it is better to give a deep-rooted bio cover like Vetiver (locally known as *Ramacham*) if other methods are not feasible.
- While constructing buildings and houses on the hill slopes, the slope geometry is to be maintained. In other words, the cutting and filling of the slopes for construction in the high slope area should be discouraged.
- The runout zone of the upper unstable area is to be considered while planning any infrastructural development on the lower slopes.
- Artificial impounding of water on slopes should be discouraged. In areas identified as high hazard zones, the construction of swimming pools and theme parks to promote tourism should also be discouraged.
- In long slope areas, the toe part should be protected from development activities. In unavoidable circumstances, any disturbance in the toe area should be accompanied by strengthening/protecting of upper slope areas.
- Provide ditch traps and fencing at a highly hazard zone prone to rock falls. Blasting is not a good option because it may trigger further rock falls. Controlled blasting under the supervision of an expert could be done in case of an emergency.
- Unstable slopes can be modified by re-grading, geotextile mats, vegetation and bio-engineering and geotechnical measures such as soil nailing, and wire machine. Anthropogenic activities that can cause saturation of the soil are to be strictly regulated in critical/prone areas. However, in locations where exceptionally deteriorated conditions of moderate dimensions already exist, the slope geometry needs to be scientifically changed to reduce the stress on the unstable mass. This may be done by providing restraining

structures to increase the resistance to slide movements. These include providing a buttress, shear keys, retaining walls, rock bolts, and piles. Grouting and electro-osmosis can also be resorted to in very specific cases.

- The Government should encourage people to secure insurance coverage for their assets in high-risk areas.
- The Government should identify (construct if needed) multipurpose shelters designed by qualified architects for temporarily rehabilitating the affected people before and during an event. These shelters in normal times could be used for other purposes such as marriage or meeting for generating funds for its maintenance. These shelters should be at locations that are safe from both floods and landslides.
- Modify the existing landslide-prone area maps (prepared by NCESS) by considering additional causative factors and past occurrences of landslides. A cadastral level mapping with micro watershed boundaries may be desirable in the high hazard zones. In case of an area which is yet to be covered under cadastral survey, maps in a 1:5,000 scale may be prepared based on topographical maps, high-resolution image, and aerial photographs.
- The risk level of the landslide occurrence should be estimated and depicted on the refined hazard zonation maps at the cadastral level by incorporating vulnerability that considers population data, land use, infrastructure, assets, etc.
- Locations of current landslide incidences should be mapped in the hazard zonation maps prepared by NCESS (1:50,000 scale) for ready reference.
- Initiate studies that can help develop rainfall intensity-based probability for landslide occurrences.

c) Flood

The floods of 2018 and 2019 have a large return period (more than 100 years). To fully alleviate the impacts of such floods is practically difficult because any structural measure would not have considered such a high return period of floods due to their very low probability of occurrence. However, mitigation measures and preparedness can be planned to reduce the negative impacts of such calamities. The following are some of the suggestions to reduce the impact of flood in the future:

- As the catchment area of most of the reservoirs of the State drains forest areas, they do not experience heavy silting unlike the reservoirs in other parts of India, especially the ones in Himalayan Rivers. However, the storage capacity of most of the reservoirs in the State might have been reduced to varying extents as there was no periodic desilting action performed in the past decades. This capacity reduction would certainly have lowered the originally designed efficiency of the system. Therefore, the committee recommends that the storage capacity of all the reservoirs shall be evaluated at periodical intervals, say 10-20 years, to determine the amount of siltation on a priority basis, and desilting be planned accordingly if required.
- Several rivers that have reservoirs did not have larger flows in the past as the reservoir releases were minimal. Therefore, the concept of floodway and flood fringe can be introduced for flood zoning. The floodway is the high-risk area, which should be kept free of any construction to allow free movement of floodwater. The level of risk can be determined based on factors like depth and velocity of floodwater, duration of flooding, available flood storage capacity, or rate of rising of floodwater. In the flood fringe area, constructions may be permitted under certain conditions. In regulated rivers, this can be ensured by the controlled release of water (may be of magnitude corresponding to a 2-5-year return period of the virgin catchment) on specified intervals (example, once in 2-3 years) during active monsoon season. Such actions would ensure no encroachment into the river beds immediate downstream of dams.
- Buffer zones are to be demarcated on both the banks of the rivers (50-100 m from the bank) based on the geomorphological characteristics, where no construction is to be allowed. However, the cultivation of seasonal crops can be permitted in these buffer zones. Riverbank maps prepared under River Bank

Protection and Sand Auditing project being executed by the Institute of Land Development and Management (ILDM), Revenue Department, Government of Kerala may be used for this purpose. In fact, agencies involved in riverbank mapping and sand auditing projects may be entrusted with this job of buffer zone demarcation.

- The Committee observed several obstructions in the flow channels (including rivers), which caused reduction/restriction of flow downstream resulting in the accumulation of water upstream. This was noted at different locations (Mukkom, etc.) in the 2019 floods. This was specifically observed in the Kallayi River, where sediment accumulation resulted in an island formation that obstructed the river flow by almost 80 per cent. In addition, dumping of construction debris was observed in the river bed at many locations, that also caused restriction to the free flow of floodwater. Therefore, a smooth passage for the flood flow needs to be maintained in rivers. This can be done by periodical monitoring and clearing of river channels/drainage lines. This will reduce the bed roughness of rivers and ensure sufficient conveyance capacity. River cross-section data generated under river bank mapping and sand auditing projects under ILDM may be used for this purpose. River rejuvenation programme as initiated for a couple of rivers like Killi Ar, Karamana may be encouraged and executed throughout the state involving local people, and local self-government departments (LSGDs).
- The existing reservoirs in the State are conservation-oriented, and the policy is to harvest water as much as possible to the full capacity during the rainy season. None of them had an operating policy that considered flood control until 2018. After 2018, some of the dams have considered flood control in their revised operation policy. In the case of other reservoirs, it is suggested to revisit the rule curves by considering the dams as multi-purpose and multi-reservoir water resources systems, and develop integrated reservoir operation policies so as to maintain the balance between flood control and other objectives, such as hydropower generation, irrigation and drinking water uses. In addition, a relook at increasing the flood cushion in most of the reservoirs can be attempted.
- Wetlands such as rice fields, ponds, and lakes used to play a major role in flood control. While there are a large number of wetlands in the State, most of them have deteriorated or been abandoned or reclaimed and have become ineffective in their primary role. Therefore, it is suggested to restore the wetlands in the State on priority.
- Most of the river beds and flood plains have been deposited with sediments during the last two major floods. This has caused a further reduction in carrying capacity. Therefore, rejuvenation of the rivers to their original capacity is required.
- Wherever feasible, consider constructing levees and floodwalls. This should be done after a proper scientific feasibility study.
- It appears that a zonation of flood hazard has not been done for most of the rivers. What is available is only the flood-prone area map, which would only help in planning developmental activities. Flood impact mitigation requires the flood zones corresponding to different return period floods or return period rainfall. Since the floods are mostly caused by the EREs, it is recommended to simulate and demarcate the flood inundation zones corresponding to different rainfall return periods (example 10, 25, 50, 100, 150 years). In addition, such maps can be prepared for different ensemble magnitudes of rainfall (without assigning any return period), and a library can be built using the simulations. During the onset of EREs, case-based reasoning can be performed on this library to approximate the possible flooding areas, which can be used for evacuation/mitigation. Such models, when developed, can also be used on a real-time basis to demarcate the approximate flooding zones.
- In addition to the flood hazard zone mapping through simulation, flood risk maps should also be developed. Flood risk maps will show the possible adverse consequences to people, health, livestock, economic activity, the environment, and cultural heritage in the event of floods. The map should show at least the risk to the potentially affected people (during day-time and night-time) including the indicative number of transitory people (example, tourists), aspects of economic activity, protected areas and natural environment, and where present, the facilities causing accidental pollution should they be flooded.

- An effective flood warning system is to be developed and implemented on priority. Since the predictive capability of the rainfall forecast models is limited, the flood warning systems cannot be fully dependent on the rainfall forecasts. Therefore, flood warning systems that depend on flood discharge at upstream locations and the time of travel to a downstream location may be planned and developed. This kind of warning system will mitigate human/livestock casualties. Telemetry systems can be effectively utilised for this purpose.
- Develop operation and maintenance manuals for flood gates and shutters. Perform maintenance, operation, and monitoring during the pre-monsoon period, and rectify the issues at regular intervals. Trials and test operational procedures should be performed at defined intervals. Ensure timely gate operations during flood events.
- It is noted by the Committee that flood accumulation in the lower Kuttanad region was mostly due to insufficient capacity to discharge the flood water to the ocean. Therefore, it is suggested to clear the sandbars near the Thottappalli Spillway on a regular basis and ensure the original width of the channel (downstream of the spillway) for smooth flow of the floodwater. Also, an increase of the width (~to 300 m) of the lead channel to the Thottappalli spillway is recommended.
- It is noted that the dwellings in the lower Kuttanad region are scattered and are aligned along the bunds. This reduces the effectiveness of evacuation in case of a severe flood event. Therefore, it is suggested to facilitate settlement at identified clusters.
- Since forests cover the majority of the catchment area of the rivers of the State, research studies may be carried out to understand the significance of forested watersheds in flood hydrological response.

d) Recommendation for Sustainable Housing in Hazard Zones

In the flood-prone areas of the State, building controls are not stand-alone solutions to mitigate flood risk. Instead, they need to be implemented in conjunction with other flood mitigation measures. Building controls are important to reduce damage to buildings and their contents. Setting the minimum floor levels for residential buildings and other structures in flood risk areas can reduce the frequency and extent of flood damage. The minimum floor level should be determined from the flood levels derived from significant historical flood events or floods of specific annual exceedance probabilities.

- Erection of fences/compound walls, whether solid or open, can affect the flood flow behaviour and flooding pattern by altering flow paths. The impact of such structures will depend on the type of fence and its location relative to the flow path. Hence, controls should be considered in relation to the type of fencing permitted, or to limit its location or height depending on the geographic area. In general, solid fencing, especially to ground level, should not be erected across flow paths where it might act as a dam. Open fencing is preferable.
- Flow velocities, flow depths and associated debris loads can affect the structural soundness. Hence, the structural soundness of the buildings in the flood-prone areas needs to be considered for the local hydraulic conditions.
- Emergency services (for example, water treatment and distribution, power generation and distribution, and communication services) might be disrupted during floods. Hence, the vulnerability of the emergency services to floods must be minimised. Service providers should also consider the emergency response and recovery planning for floods for key assets.
- Landslides lead to the complete destruction of houses and buildings that fall directly in the path of the flow. Moreover, it was seen that the walls of the buildings that are constructed with load-bearing masonry walls and reinforced concrete slabs were completely destroyed and the slab collapsed as a whole (pancaking type failure). It is difficult to design buildings that are resistant to landslides or floods. Nevertheless, it is recommended that all buildings in areas prone to landslides and floods be designed as per the norms of seismic zone 3, though the region is not in a seismic area. The justification is that the provisions for design in seismic zone 3 regions will lead to better lateral resistance and ensure that the pancaking collapse does

not occur. Further, the foundations will also be such that there is better resistance against the force of mud and water.

- Habitations in flood plain, if unavoidable, could be designed as in the case of buildings in the coastal areas that are prone to tsunamis; i.e., the same regulations as in the case of tsunamis could be followed.
- Habitations in steep terrains could be designed such that the slopes are reinforced/strengthened by soil nailing. Further, the design should follow the provisions of design for seismic zone 3. As far as possible, the steep slopes should not be disturbed; if inevitable the building design should be made in such a way that the slopes need not be altered.
- Model structures may be constructed by following the existing provisions for coastal areas taking into account the effects of scouring, lateral impact of boulders and mud, and the maximum expected flood levels.

e) General Suggestion

- The Committee has analysed spatial and non-spatial data collected from different agencies and departments. Therefore, an important suggestion is that a centralised facility/ repository to store and share data may be created. The facility should be a single point contact, where all the data collecting departments should submit the data related to natural/man-made resources and data related to various hazards. This will (a) eliminate the generation of redundant data, (b) bring uniformity to data from different sources, and (c) ensure data quality. A policy should also be developed for sharing the data between different departments or academic and research organisations.
- During interactions with the survivors of landslides, the Committee observed that the traditional/ancestral knowledge of environmental and biological signals has been used to cope with natural hazards, which helped them to forecast the hazards. Hence, the Committee suggests to carry out research investigations to understand the scientific background behind these kinds of linkages. This may be helpful for developing early warning systems.

CHAPTER 10

KERALA'S RESPONSE TO COVID19

When the other Indian states stood helpless in tackling the Covid-19 pandemic, Kerala, backed by its well-established public health system and decentralised governance rolled out schemes and programmes to revitalise the economy and prevent the spread of the virus with innovative steps, drawing accolades from across the world.

The Beginning

Since January 30, 2020, when the first case of Covid-19 was reported in India in Kerala, the State government adopted a multi-pronged strategy to deal with the pandemic, which received wide appreciation and acclaim.

Medical and Public Health

Kerala — Health system response to Covid 19

Kerala has a strong primary health care system augmented by the three-tier Local Self-Government system. Kerala also has a strong network of health workers and volunteers who are involved in ensuring the provision of comprehensive health care to all. Managing public health emergencies like floods, landslides, and outbreaks like the Nipah virus has further strengthened our health care system. When the information regarding the outbreak of coronavirus in Wuhan city of China was received, health department activated its emergency response mechanism to prevent an outbreak within the state.

Soon after the declaration of first COVID case in the State, a detailed evaluation of all the health care facilities in the state in both Govt. and private sectors was done. The baseline data regarding the number of hospital beds, ICUs, ventilators etc. were collected and analysed. The total available beds were categorised into Plan A and Plan B and any additional beds that could be allocated by converting other facilities were allocated as Plan C. A detailed action plan on how to use these facilities was prepared at the State level by conducting a series of meetings in all the districts. All confirmed and suspect cases were initially admitted to Plan A facilities. It was also decided, if the occupancy in Plan A facilities goes beyond the threshold, Plan B facilities will be utilized.

Covid Care Centres (CCCs) were created for the quarantine of all international passengers, interstate travellers and contacts who do not have facility for quarantine at home as per guidelines. Covid Hospitals were designated for management of symptomatic patients and Covid First Line Treatment Centers (CFLTCs) were designated for management of asymptomatic Covid positive patients. As caseload increased, CFLTCs also admitted patients with Category A symptoms. COVID Second Line Treatment Centres were also identified and made functional. At least 2 hospitals in each district were designated as Covid Hospitals for the treatment of symptomatic patients in the initial phase, and each COVID Hospital was linked to 2 adjacent CFLTCs.

The guidelines and Standard operating procedure were prepared for setting up and management of Covid Hospitals and CFLTCs. The guidelines for admission to these centres were revised from time to time. Checklists were prepared for weekly monitoring of Covid Hospitals and CFLTCs and close monitoring of the functioning of these facilities are done on a weekly basis. CFLTCs are also supported by the Local Self Governments (LSGs) concerned. Provision of adequate staff, biomedical waste management etc. are supported by LSGs. Supervisory teams were sent from the state to all districts to monitor the functioning of all Covid hospitals and CFLTCs. The team did supportive supervision of all facilities using a checklist prepared at the state level. Daily review with all hospital superintendents was done through video conferencing and remedial actions taken for any deficiencies or shortcomings. Admission and discharge of all patients are being done as per guidelines which are revised from time to time based on clinical evidence. The guidelines and other related documents were published on the website www.dhs.kerala.gov.in so that there is transparency regarding the guidelines and SOPs used in Covid management.

Covid patients are admitted to these facilities as per the state guidelines. All Covid positive patients are admitted to the nearest Covid hospital/CFLTC. A nodal officer has been assigned to each Covid care facility. Helpdesks are functioning at all such facilities and Helpline numbers have been provided to the patients and bystanders. In addition, psychological support is being provided to all the Covid positive patients and other persons in quarantine through dedicated Psychological support team.

In addition, infrastructure management teams at State and districts levels were also closely monitoring the functioning of all facilities providing Covid treatment. The management and supervision of all infrastructure related matters is dealt directly by a high-level committee at the Government level. Infrastructure management teams were created at both State and district levels to closely monitor the bed occupancy status on a daily basis and for coordinating the allocation of additional beds/facilities. Adequate number of ICU and ventilator beds were also allocated for management of Covid patients with severe symptoms. As on 28.09.2020, a total of 9125 beds were allocated in Covid hospitals. 1429 beds in other government hospitals, 35874 beds were allocated in CFLTCs and 4813 beds in other private hospitals (total beds in these

private hospitals is 21768) for treatment of Covid-19. Details of hospitals and number of beds are given in Table 1.

Table 1: Type and number of hospitals and beds

Type of Hospital	No. of Hospitals	Total No. of Beds
Covid Hospital	29	9125
Other Govt. Hospital	32	1429
CFLTCs	229	35874
Other Pvt. Hospital	139	4813
Grand Total	429	51241

Source: Directorate of Health Services

Private Sector engagement in COVID 19 management

A dedicated Private Hospital Management team was constituted in the State as well as district Control Rooms. From the beginning of COVID control activities, the Private Hospital engagement team was working in close liaison with the District Private Hospital engagement nodal officers, the private hospital managements and IMA. They have enlisted all the private hospitals district wise and collected the details of the available facilities including bed strength, ICU facilities, ventilators, specialists available, dialysis facility and ambulances.

A series of online meetings with the representatives of private hospital organizations viz. Indian Medical Association, Kerala Private Hospital Association, Catholic Hospital Association of India (CHAI), Private Medical colleges Association and Qualified Private Medical Practitioners Association were held. Honourable Chief Minister and Health Minister have conducted interactive sessions with the Private Hospital owners and management representatives. The Principal Secretary, State Mission Director (NHM) and Project Director (KSACS) also conducted multiple online meetings with the Private Hospital Associations and discussed on Covid 19 case management in private hospitals, non-Covid case management, telemedicine facilities, mobile medical units and HR support.

Further discussions were held on the rates to be fixed for the utilization of private hospital facilities for the management of COVID – 19 patients. The existing KASP rates were offered to private hospitals. After further discussion Govt. announced the Health Benefits Package 2.0. The Private Hospital Associations agreed in principle to the Government rates. Government of Kerala issued a GO announcing the package rates and issued guidelines to implement the Public-

Private Participation. So far 50 hospitals have accepted the proposal and joined hands with the Government system in Covid care.

Infrastructure and Material Management

The Kerala Medical Services Corporation Limited (KMSCL), a fully owned company of Government of Kerala under the Department of Health and Family Welfare is the central procurement agency for all essential drugs including medical devices and equipment for the health care institutions under Government. The Corporation is also the Special Purpose Vehicle and entrusted with the setting up of medical based ancillary facilities such as Cath Lab, Dialysis centres, Pathological labs, diagnostic centres, x-ray/scanning facilities, ambulance services etc. in the state. With the outbreak of India's first Covid 19 case in Kerala on January 29, 2020, the state geared up to face the gravest challenge. The Department of health had immediately taken action and State Control Room was activated. The Rapid Response Team (RRT) became functional at the state headquarters and KMSCL was entrusted with the task of material procurement, logistics and supply chain management. For the management of COVID 19, KMSCL had set up one Covid Cell in the headquarters under the leadership of the Managing Director with all department heads as members.

Setting up of Covid First Level Treatment Centres (CFLTCs)

To manage the COVID-19 pandemic, Government has identified certain hospitals and declared as dedicated Covid hospitals for managing and providing treatment to patients tested positive. With the increase of cases, few more hospitals were added to the grid. However, it was understood by that time, all the patients tested positive and admitted to Covid hospitals did not require treatment and medical management and certain patients only need to be kept in isolation till the infection end. Hence Government introduced categorisation of the patients' based on certain guidelines. It was decided that patients under the category with mild symptoms will be admitted to lower level of medical care so that Covid hospitals can provide treatment to the needy critical patients. Hence the concept of Covid First Level Treatment Centre (CFLTC) was introduced. A treatment protocol to shift the patients from CFLTCs to Covid hospitals and vice versa was formulated to reduce the burden of hospitals. CFLTCs will be setup in an area other than hospitals by taking up hostels, auditoriums etc. which can be converted like a general ward kind of arrangement. Each CFLTCs will be associated with a Covid hospital. The equipments, furniture, consumables and other amenities required for a centre will be based up on the number of beds identified. Each CFLTC will have patient beds, suction apparatus, Oxygen Cylinders, pulse oxymeter, ECG machines, etc. KMSCL is procuring 45 different items for each CFLTCs. The status of admission in covid hospitals and Covid First Line Treatment Centres are given in table 2.

Table 2. *Summary of admission in Covid Hospitals and CFLTCs as on 28.09.2020*

Covid Hospital Summary		CFLTC Summary	
Total Beds set apart for Covid treatment	15367	Total beds set apart for Covid treatment	35874
Beds occupied by Covid positives	7856	Beds occupied by Covid positives	20029
Beds occupied by Covid suspects waiting for test results	565	Beds occupied by Covid suspects waiting for test results	179
Covid positive patients admitted with severe symptoms	457	-	
Covid positive patients admitted with mild symptoms	1629	Covid positive patients admitted with mild symptoms	2225
Covid positive patients admitted who are Asymptomatic	5770	Covid positive patients admitted who are Asymptomatic	17804

Source: Directorate of Health Services

Arrival of Non Resident Keralites

COVID 19 pandemic, in its 1st Phase up to 5th March 2020, reported 03 cases from different districts of Kerala. The second wave of COVID 19 pandemic was reported in the State from March 6th, 2020 with heavy case load. State of Kerala had taken extensive steps for containment and mitigation which resulted to an average active case load less than 2,000 across the state. In the last week of June 2020, Govt of India has given permission for the return of expatriates from various foreign countries.

Government of Kerala intended to bring back all the stranded Keralites safely into Kerala, it has been decided that all returnees shall undergo screening at arrival airports as per the protocols set by Health Department, Government of Kerala. It was further decided that all returnees including asymptomatic persons who do not have proof of having undergone necessary tests will be subjected to rapid antibody test up on arrival at airport by authorized agencies of Government of Kerala.

Ambulance Network

The ambulance service network should be one of the critical areas as far as patient care is concerned. KMSCL has played the most critical role in the ambulance services by managing the Kaniv-108 ambulances to mobilize the Covid-19 suspects/patients from their households/exit points to the isolation facilities. Four categories of Ambulance networks were organized through KMSCL in districts for the Comprehensive Ambulance Services for the Covid19 by engaging the

IMA ambulance network and facilitating private ambulance. Total number of 316 ambulance vehicles are there in these categories and number of vehicle using for covid 19 are 293.

Psycho Social Support during Covid Outbreak in Kerala – ‘Ottakkalla Oppamundu’

During the corona virus outbreak in Kerala, it was decided to provide Psycho Social Support to the persons in quarantine/isolation and their family members. On February 4th, Psycho Social Support (PSS) Teams were constituted by Government in all districts, under District Mental Health Programme (DMHPs). Psychiatrists, Psychiatric Social Workers, Clinical Psychologists, Social Workers and Counselors started working in the entire state under DMHPs. Psycho Social helplines were arranged in all districts in addition to the DISHA Helpline Number for the entire state. All persons in quarantine/isolation are being called, given Psycho Social Support and District Helpline Number provided to call back in case of any further psychological/social needs. Psychiatrists/Clinical Psychologists/PSWs address the needs if any and follow up calls are given every 3 to 5 days.

Later as the number of persons in quarantine began to increase drastically, counselors from ICDS, ICTC and NHM were given training and pooled under the PSS Teams in districts. As of now 1327 Personnel are working in the entire state to provide Psycho Social Support. Two Helpline Numbers are available per district for general public and Health Personnel. Stigma related issues were mostly due to spread of fake information, social isolation and social media harassment. Measures were taken to create awareness and in case of social media harassment, information was sent to media cell of control room. A six Minute Video on Relaxation Technique was prepared by Mental Health Programme and sent to the persons in need. An awareness leaflet on better communication and stress management was prepared and given to staff of isolation wards. The same was also provided to the training team to be included in the training module of isolation ward staff.

During lockdown period targeted services were started under PSS Teams whereby Psycho Social Support/Counseling calls are made to Mentally ill patients on treatment, Children with special Needs, Guest Labourers, Elderly people living alone and Psychological Support to Personnel working in Corona Outbreak. During the lockdown period, as the number of alcohol withdrawal cases began to increase, Community de-addiction guidelines were prepared with the aim of treating majority of the cases in Primary Care itself. A panel of Psychiatrists has been formed in all districts to help primary care Medical Officers in Community based de-addiction.

As on (06.10.2020) 14.44 lakh persons in quarantine/isolation were given Psycho Social Support/Counselling calls. Among the psychological issues noted were Stress, Anxiety, Stigma, Social Needs and Sleep impairment. 12.99 lakh follow up calls with 70216 counselling were given for those with above issues. Social needs like food, medicine, medical consultations, other essential items were met through ICDS, Youth Welfare Board and LSGs. Psycho Social Support/Counselling calls were given to 31,520 Mentally ill patients, 74,087 Children with Special Needs, 24,690 Guest labourers and 2,18,563 Elderly people living alone, till 06.10.2020.

Psychological Support is also being provided to Health Personnel working in Corona Control activities. 60166 calls were made in this regard. A module on Stress Management and Motivation Enhancement among Health Personnel was prepared and sent to districts for conducting online classes to frontline Doctors, Nurses, Health Workers, ASHAs and Control room Personnel.

As Suicides were reported among school children while starting online classes, Psycho Social Support was extended to all school children. All ASHAs and AWs in the districts identified children with emotional-behavioural issues using check list provided by MHP. Phone numbers of their parents are provided to PSS teams through respective PHC and ICDS for psychological intervention calls. In addition to this the school counsellors of PSS team also identify children with emotional-behavioural issues in their schools, and ensure appropriate intervention from PSS team. DISHA Helpline number is advertised for children to call in case of any need. Till 06.10.2020, 347105 children have been given reassurance calls and among them 34931 children were given counselling and 36 children were started on pharmacotherapy for various psychological issues. A total of 3541194 Psycho Social Support/Counselling calls have been given till 06.10.2020.

Capacity Building

The Directorate of Health Services and the National Health Mission joined hands to team up all departments in the state and private organizations. Trainings were designed and conducted in three domains viz. sensitization programme, skill training, motivational and stress management training and refresher training. NHM training division regularly supports the district with necessary fund for conducting the training at the districts. The state level activities of capacity building team are divided in to three i.e. a team of content preparation was undertaken by NHM training division team for training implementation by district training teams and team for training monitoring undertaken by SHSRC team. It was a herculean task that in a short term of time spans the entire health management system and the risk population should undergo adequate training in the prevention activities of Corona virus infection.

Target group for Covid-19 training

State level trainings have been conducted exhaustively and elaborately covering all staff working with in the health sector and covering many a sect of the society viz.

Health care staff (Both government and private)	Line department and General public
<ul style="list-style-type: none"> • Doctors • Staff Nurses • Nursing Assistants 	<ul style="list-style-type: none"> • LSGD representatives • Kerala Police department • Volunteers- NSS/NCC etc.

<ul style="list-style-type: none"> • Laboratory Technicians • Field staff • ASHA worker • Anganawadi workers • Attendants • House-keeping staff • Ambulance drivers • Security personnel 	<ul style="list-style-type: none"> • Kudumbasree • School students • College students • Teachers of school and colleges • Drivers- both private/govt. taxi etc. • Special emphasis was laid on training the migrant workers • General public
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Total number of 18707 ASHAs, 10658 anganwadi workers, 42574 Kudumbashree, 21312 palliative volunteers and 9596 others have been deployed as health care volunteers. A total number of 16474 additional human resources was approved through NHM and 10610 posted. Details of training conducted as on 29.09.2020 are given in the Table 4.

Table 4 *Summary of training conducted as on 29.09.2020 for covid 19*

Sector	Category	State Cumulative – Phase I	State Cumulative – Phase II
Government Sector	Doctors	8251	20456
	Paramedical Staff	19562	30114
	Non Paramedical Staff	4519	6205
	Attenders	3521	3788
Private Sector	Doctors	3644	3698
	Paramedical Staff	6610	6210
	Non-Paramedical Staff	187	343
	Attenders	2798	1318
Others	ASHA Workers	19794	8729
	Line Department Staff	100577	88229
	Volunteers	Included in line department staff total	66888
	LSGD Representatives	15789	5349
	Kudumbashree Workers	35443	13801
	Anganwadi Workers	14117	5384
	Ambulance Workers	1450	1435
	Nursing Students	17618	1159
	School Education	485145	63661

	Field Staff	9202	5918
Total		748227	332685
Grand Total		1080912	

Source: Directorate of Health Services

COVID-19 Management – Volunteer and Elderly Care

A community level coordination with the support of LSG, community volunteers, Kudumbasree, and Women and Child Development Department organised in all districts. Ward level teams are active in all Panchayath and are ensuring daily calls and visits to the homes of the elderly. The volunteer team comprising of ASHA, Kudumbasree, Palliative volunteers and community level volunteers, under the leadership of ward member was constituted in all wards. 3 lakh volunteers of ASHA, Kudumbasree and Palliative volunteers are coordinating the Elderly and Palliative care activities in the field level.

Activity Report on Mass Media Campaign for Covid-19 awareness

A series of mass media campaigns are being conducted for Covid-19 awareness from the beginning of 2020 itself. The campaign was started in January 2020 by giving alert messages regarding Covid-19. The campaign shifted its gear and intensified just after when the first Covid case was officially announced on Jan 30. Honourable Health Minister's video byte requesting all the people coming from Covid affected countries to follow government regulation were widely disseminated through Television Channels, FM Stations, Print Media, and social media. All the media platforms were widely used for educating the people on Covid-19 pandemic and disseminated important Do's and Don'ts.

A Special Booklet named 'Karuthal' with proper awareness contents on Covid and non-Covid diseases were printed and disseminated through DPM's. In order to intensify the social media campaigns, a Comprehensive Whatsapp Chatbot was implemented with the help of Whatsapp where the people can get important messages and contact details by just saving our official mobile number in their phone. Moreover audience targeted social media campaigns were also conducted by focusing people returned to Kerala and other Keralites living in different parts of the world. A Special Postal cover was issued with Covid awareness content with the help of postal department. A special campaign was also conducted through Victors channel after the government started online classes through the channel.

Hoardings with awareness contents were placed all over Kerala with special consideration to major cities. Vehicle branding was conducted by placing awareness contents on Janashathabdi

train and different vehicles of department of Health and Family Welfare. A special campaign was conducted through the online media handles of mainstream media and important awareness messages were also published in most circulated magazines as well. A series of awareness videos, animation videos, graphical videos, were produced and disseminated through all the platforms. A special interactive session was conducted for media persons as well as for common people to clear doubt about the pandemic and the session was went live through all our social media handles. 1000 masks with IEC messages were printed and distributed.

e-Sanjeevani – Telemedicine platform

Health Department launched e-Sanjeevani telemedicine services in Kerala on June 10th 2020. They are providing services in a centralised manner and DISHA is the state hub managing the telemedicine activities for the State. DISHA is performing well to manage and keep the system running. E-sanjeevani has boarded 368 doctors including the specialist doctors providing services on the platform. They are providing services for average 500 person per day all across the state. The average time for a consultation is 10 minutes 40 seconds and the average patient wait time to get connected to a doctor is 3 minutes 54 seconds. E-sanjeevani has general OPD services as well as speciality OPD services. When social distancing is among the major measures used to fight against COVID-19 pandemic, tele-health is stepping-up as a key technology for safe and efficient communications. The World Health Organization mentioned telemedicine among essential services in “Strengthening the Health Systems Response to COVID-19” policy. By providing these services, the rush in the outpatient department can be reduced and the delivery of services is ensured to the general public at their door step. Telemedicine services have been identified as an excellent modality to render essential medical consultations to people in the background of COVID19 pandemic.

GoK Dashboard

The Covid 19 data is made available to public via the GOK dashboard available in the web address www.dashboard.kerala.gov.in. This dashboard is daily updated with the Covid 19 data made available from various departments. The dashboard provides an over all view regarding the Covid status of the state. The dashboard depicts the number of Covid 19 cases, active cases, recovered cases, total number of deaths, district wise distribution of cases, district wise distribution of person under hospital quarantine and home quarantine, daily hospitalization, number of samples sent, test, result under process etc. dashboard also shows the hotspots across the state, volunteer distribution, distribution of volunteer support group, details of psycho social support etc.

Data management

The data from IDSP, KSDMA and KSDI is collected and collated in to a google spread sheet. The data collected were LSGD wise active cases, primary contact, secondary contact, Covid positive health worker and LSGD wise daily count of cases. Initially this was done using the technical expertise of a volunteer, now the maintenance and task of updating the google spreadsheet is carried out by the NHM data manager. The data of primary and secondary contacts is being updated regularly.

ECONOMIC RESPONSE

Introduction

The pandemic and subsequent lockdown have had a devastating impact on the State's economy. The national lockdown that started on March 25, 2020 and extended till May 31, 2020, brought the economic activities to a stand-still. The lockdown continued in specific areas based on the number of cases. Most of the productive sectors bore the brunt of the lockdown, while some sectors like agriculture, banking, and public administration were largely unscathed. Covid affected different sectors of the State's economy differently.

In the quick loss assessment report brought out by State Planning Board, GoK in May, 2020 the overall loss was assessed considering the sectoral shares of GVA and employment in the States' economy and assuming loss of production because of the halt in economic activities. For the first quarter of 2020-21, the total lockdown in April was expected to bring about 80 per cent loss in GVA and the subsequent two months were expected to have about 15 per cent and 10 per cent losses. Along with these assumptions and considering that the State's economy would have grown at the same rate as in 2019-20 but for the lockdown, a loss of Rs 80,000 crore anticipated in the first quarter. The loss in sectors such as agriculture, animal husbandry, fisheries, industry, labour, tourism, and IT were also assessed.

The loss assessment report that was brought out later by the State Planning Board identify that the first quarter GVA to shrunk around 26 per cent of last year's first quarter GVA. The overall GVA for the year 2019-20 is provisionally estimated to be Rs 7.36 lakh crore after taking in to account the impact of lockdown in March. Of this the first quarter, GVA is estimated as 2.11 lakh crore. The GVA for the first quarter of the year 2020-21 is estimated to be 2.42 lakh crore. Using the currently available information this estimate is now 1.69 lakh crore. This would mean a loss in GVA of around 73,000 crore implying a 30 per cent loss in the GVA expected for the first quarter of this year. Using the same methodology the estimated loss for the second quarter compared to the same quarter of last year would be around 36,000 crore which work out to a loss of 21 per cent. The second-quarter estimates are likely to have more uncertainty because of non-availability of indicators for the full quarter besides lower contribution of the primary sector.

However given the current state of the economy, it may not be appropriate to use an expected normal quarter and then compute the loss from this expected value. As per the DES estimates the expected GVA for Q1 of 2020-21 is around 14 per cent higher than that of Q1 of 2019-20. It may be more appropriate to estimate the loss with reference to the estimate for the corresponding quarter of 2019-20, similar to the quarter on quarter or year on year changes usually used for GDP growth rates. In this situation, one would expect the first quarter GVA to shrink to around 26 per cent of last year's first quarter GVA. The loss in GVA during Q2 compared to the same quarter of last year would be 18.5 per cent. It may be noted that at the national level the first-quarter GDP has been estimated to be 23 per cent lower than the corresponding quarter of last year.

Kerala's Economic Interventions

Anticipating the adverse impact, the Government of Kerala undertook various initiatives to arrest the impact of Covid-19 on the State's economy and lives of people. These include infusion of money into the economy through direct and indirect support, ensuring food and shelter for the needy, generating employment opportunities, increasing production of agriculture and industrial sector, and support to non-resident Keralatians who returned home from abroad as well from other States. The government disseminated information about the speed of the pandemic and the containment strategies adopted by it.

The Rs 20,000 crore Covid-19 Package

Realising the adverse effect of the lockdown on the economy of the State and the lives of the people, the Government of Kerala came out with a Rs 20,000 economic package to tide over the crisis, much earlier than other States and GoI. Out of this, Rs. 1,320 crore was set aside to disburse welfare pensions in advance for 2 months in March itself. Another Rs. 100 crore was allocated to provide assistance of Rs. 1,000 each for families that are not eligible for welfare pensions. In the subsequent two months, Rs. 2,000 crore was disbursed as loans through the Kudumbashree scheme, with the State Government bearing the interest component. And Rs. 2,000 crore was set aside to provide jobs under the employment guarantee scheme.

The government allocated Rs. 500 crore to meet the additional expenses in the public health to roll out Covid-19 care facilities. To provide food grain through the public distribution system, the government further allocated Rs. 100 crore. Besides, an allocation of Rs. 50 crore was made

to provide meals at just Rs. 20, as part of the Hunger Free Kerala project. To roll out this, the government set up 1,000 food stalls in April itself.

Further, the State government allocated Rs. 14,000 crore to clear all pending payments of the State Government to institutions and individuals. Thus, Rs. 20,000 crore was infused into the State's economy on an emergency basis.

Apart from the emergency direct infusion of cash into the economy, relaxations in norms and bill payments were given to ensure that people have additional cash at disposal. Fitness fee for auto rickshaws and taxis was relaxed. Relaxation of one month was provided in the quarterly taxes of stage carriages and contract carriages. These concessions amount to Rs. 23.60 crore. The government also allowed delayed payment of electricity and water bills for one month without any fines. Entertainment tax on movie theatres was waived.

Discussions have been held with organisations of traders and businessmen to ensure adequate availability of essential materials during the lockdown. Online facilities were set up to ensure delivery of essential articles, including vegetables and pulses to families during the lockdown. Voluntary services of organisations are being ensured to assist people in need. Books are being made available to those in quarantine with the assistance of publishing houses. Sufficient internet bandwidth is also being ensured, following discussions with service providers.

A meeting of the State Level Bankers Committee (SLBC) was called to persuade banks to not undertake any loan recovery proceedings during the economic turmoil caused by the pandemic and to provide financial relief.

The Government took measures to channelise the scarce resources at its disposal to address the most important needs of the economy. The schemes in the Plan of 2020-21 were sequenced in order of priority so that the resources are utilised effectively.

Food Security

Kerala devised a special scheme to ensure that food was available to all. 'Subhiksha Keralam' is a massive people's campaign to achieve self-sufficiency in food production. The programme aims to increase farmers' income, attracting youngsters to farming and rehabilitating return migrants, by giving new life to agriculture in the State. An infusion of Rs. 3,860 crore is to be provided in just

one year. Anticipated expenses are to the tune of Rs. 1,449 crore for agriculture, Rs. 2,078 crore for fisheries, Rs. 215 crore for dairy development, and Rs. 115 crore for animal husbandry.

As per the Plan, paddy is to be cultivated in 5,000 hectares, vegetables and plantain in 7,000 hectares each, tubers in 5,000 hectares, and lentils and small grains in 500 hectares each. Measure to cultivate a total of 25,000 hectares of fallow land is being undertaken under the leadership of the Local Self Governments, with the guidance of the Department of Agriculture and the cooperation of the general public. Kitchen gardens are to be encouraged in all households. Government provided seeds and saplings. A chain of cold storage facilities is envisaged to ensure that the produce is preserved after harvesting. The State is preparing to adequately market the increased production so that it gets a larger market share as well.

The major departments involved in the programme are Agriculture and Farmers Welfare, Animal Husbandry, Dairy Development, Fisheries. Co-operation, Water Resources, Industries and LSG to provide credit, marketing and irrigation support.

The measure for ensuring assistance and relief to the agriculture sector during the lockdown period started much earlier. A total quantity of 386,944 tons of paddy was harvested in Kerala till the first week of April 2020, of which 1,64,951 tonne was procured by Kerala State Civil Supplies Corporation Limited (Supplyco).

The Department of Agriculture, Vegetable and Fruit Promotion Council Keralam (VKPCK), and Horticorp intervened in the marketing of vegetables. The Farmers Retail Outlets (FRO) set up locally (one each in every panchayat, two each in municipalities, and five each in corporations) enabled farmers to sell their products locally to consumers. The online marketing strategy adopted by the government agencies helped in the direct sale of products like mango, pineapple, banana, papaya and vegetables to the city dwellers. Moreover, the inter-district movement of surplus produce was also organised. Six hundred Paddy threshers were arranged by the department in Palakkad, Kuttanad and Kole areas.

From March 23, 2020 till April 15, 2020, Horticorp procured 1200 MT of fruits and vegetables from farmers within and outside the State. Online sale of fruits and vegetables was arranged through online food delivery platforms in Thiruvananthapuram, Kottayam, Ernakulam, Thrissur and Kannur districts. Horticorp and VFPCCK made efforts to procure pineapple from the production sites and sell it online. Supply of fruits and vegetables was also arranged to different community kitchens, residents' associations, guest worker camps, and other agencies throughout the State. Sale of fruits and vegetables to consumers also took place through the 100 own-stalls and around 200 franchised outlets of Horticorp.

Tea

The procurement of the tea by the Government of Kerala for supply through the public distribution system lifted prices of the commodity and provided certain relief to the stakeholders. Supplyco purchased about 2.5 lakh kg for distribution under PDS as a part of the food kits of essential items being distributed during the lockdown period.

Animal Husbandry

Kerala Livestock Development Board (KLDB) has continued the supply of frozen semen, liquid nitrogen, and other artificial insemination (AI) inputs to all centres in the State during the lockdown period, even when the production suffered mainly because of the shortage of liquid nitrogen, which arrives from Pondicherry. The limited quantities of liquid nitrogen received were used to save the frozen semen doses already in stock. Under the Covid Relief Cattle Feed Subsidy Scheme, 2.95 lakh sacks of cattle feed were given to 1.82 lakh dairy farmers with a government subsidy of Rs 400 per sack. Government of Kerala funded Rs 11.83 crore of the entire cost of Rs 39.68 crore

The reduction in milk consumption during the lockdown and the restriction led to the reduction in the sales of the milk but the production and procurement remained relatively high. This necessitated the conversion of surplus milk into milk powder. Nearly 1.2 to 1.25 lakh litres per day of milk was sent for conversion to Tamil Nadu. However, the Government of Tamil Nadu refused to procure milk from Kerala.

After discussions between the Kerala and Tamil Nadu governments, on an emergency basis, Tamil Nadu agreed to procure 50,000 litres of milk for conversion per day. To avoid wastage of the surplus milk and ensure nutrition to the vulnerable sections of the society, the Government of Kerala decided to distribute milk and milk products through Anganwadis, guest labour camps, community kitchens, Consumer fed, and the Civil Supplies Cooperation through Milma.

To give an impetus to the animal husbandry sector, the government has proposed to set up 10,000 cross breed cattle units. In all Local Self Government bodies 8,000 dairy units are to be set up. Of these, 200 of them will be mechanised with Government support. Farmers were provided assistance in procuring milking machines as well. Value addition of dairy products –

like cheese and curd – will be augmented. Domestic poultry farms and piggeries are to be encouraged and assisted.

The State government has sanctioned Rs 100.09 crore as credit a part of the Kisan Credit Card campaign for the dairy farmers.

Fisheries

With the imposition of the lockdown, all fishing harbours and fish landing centres in the State were closed down. Mechanised fishing boats were not allowed to operate and fish auctions were prohibited. The traditional way of fishing was, however, permitted. Traditional fishermen were allowed to go out to fish but were asked to not auction their products, as social distancing measures were difficult to implement. Instead, purchase and sales of marine fish were conducted at a price fixed by the Government. The Harbour Management Societies were entrusted to fix the prices of different fish. In the fishing harbours and landing centres, a token system was introduced to avoid crowds. A mobile application was also developed for the online marketing of fish. The government issued orders exempting aquaculture activities, fish farms and hatcheries and movement of feed, seed, and aquaculture essentials from lockdown restrictions.

Salt water ponds will be set up in 3,000 hectares for farming Pearl Spot. Besides, 5,000 units are to be set up for joint salt water fish farming so that production can be increased by 5,000 tons. 5,000 plastic ponds costing Rs. 1 lakh per unit are also to be set up. Mobile aqua labs will be set up in all 14 districts to ensure quality and disease control. The Government of Kerala hopes to create 23,000 jobs in fisheries alone.

Securing Industries

Kerala economy has taken a hit due to the Covid19 and the subsequent lockdown. Tackling this situation is not easy. The 'Vyavasaya Bhadratha' scheme is formulated as a comprehensive plan for that purpose. It is being implemented by the Department of Industry. As a part of this, Rs 3,434 crore will be provided to small and medium enterprises (SMEs) by way of additional capital infusion and interest subvention. There are 1.56 lakh small enterprises in Kerala, 70 per cent of the total enterprises in the State. The sector also employs 40 lakh workers.

Margin money assistance and interest concession for additional credit will be provided to existing micro, small and medium enterprises (MSME). KSIDC and KINFRA will implement one-time settlement of loan arrears. Six months extension will be given to these enterprises for the

repayment of interest. 'Three months' rent will be waived off in standard design factories under the Department of Industry. Entrepreneurs who use public facilities in industrial parks will be exempted from rent for three months. Interest subsidy will be granted for MSMEs and manufacturing industries. Interest rate on loans taken for diversification and development will be discounted by 6 per cent for six months.

Special loans will be provided for working capital and asset creation for the businesses that already have a KSIDC loan. Three-month moratorium has been announced on interest and capital to all operating units under KSIDC. After the moratorium, the loan can be repaid without penalty. The fine for delayed payment to entrepreneurs who have taken loans from KSIDC will be waived off completely for six months. KSIDC will provide loans of up to Rs 50 lakh to MSMEs. The repayment period will be extended to entrepreneurs who take up space in the industrial parks of KSIDC and KINFRA. The lease premium will be reduced in advance. By way of giving special attention to the enterprises owned by members of the disadvantaged sections, women, SC, ST and young entrepreneurs will be given 25 per cent margin money.

The government has also implemented a string of relief measures and provided various incentives to IT firms which are based in the state-run IT Parks. Rent has been waived or a moratorium has been granted on payment of rent for the months of April, May and June, depending on the area under lease, for companies based in the State's IT Parks. Surcharge on rent has been waived for 6 months, from April to September. Annual rent escalation of 5 per cent has been waived for FY 2020-21, in Government owned buildings within IT Parks. Subsidies have been announced on electricity tariffs in IT Parks as well. Additional time of six months has been granted for commencement and completion of construction works in land under the IT Parks, over and above the deadline as per agreement.

The Kerala State Coir Corporation used to provide 2 months for exporters to make payments for the goods they procured from the Corporation. As a part of measures to address the economic issues due to the Covid 19 pandemic, this has been extended to 4 months. Similarly, buyers who entered into MoU at Coir Kerala Fest have been provided 20per cent discount (on the products they purchase). The benefit initially offered for 3 months till December 2019, has been extended for 6 months till June 2020. A relief package has been announced, and 1.37 lakh coir workers were provided relief of Rs. 1,000 per worker. Further, income support assistance is being provided to coir workers.

Public Sector Enterprises

The Government of Kerala mobilised its resources to produce hand sanitizers. Kerala Drugs and Pharmaceutical Ltd, a public sector company under the Government of Kerala, started mass production of hand sanitizer to ensure the availability of the sanitizers at the onset of the Covid19 pandemic.

Attracting Investments

Every challenge brings an opportunity along with it. Overcoming challenges also have to do with utilising the opportunities that emerge alongside. In recent years, Kerala has displayed a flair for emerging out of the rubble. Same has been the case this time around too. In India's battle against COVID-19, Kerala has emerged as a forerunner. The fact that amidst all these challenges, the entire Government machinery and society as a whole – including voluntary organisations – have been in perfect sync makes the State stand out as a safe and secure destination for investments.

The Government of Kerala has decided to grant all major industrial licenses and permits within one week of application, with the condition that entrepreneurs will complete due procedures within a year. Multi-Modal Logistics Centres are sought to be established in Thiruvananthapuram, Ernakulam, Kozhikode, and Kannur connecting the airport, port, railways, and roads in these cities. Once this plan materialises, Kerala could emerge as a major player in international trade and commerce. Logistics parks are to be set up in different parts of the State to take advantage of the opportunities in export and import. Azheekal Port is being equipped to handle large volumes of cargo.

Value addition of agricultural products are to be encouraged and land will be leased out to industries in the sector, at the Mega Food Park, Palakkad. A Coconut Park with emphasis on value addition is to be established in north Kerala. A star rating system is to be introduced which will grade industries as Gold, Silver and Bronze based on the quantum of investment made and employment generated, so that the Government can ascertain benefits accrued and concessions to be made. An Investment Advisory Committee consisting of investors, policy makers and industry leaders, is being set up to assist the Chief Minister in making Kerala a preferred investment destination. With these measures, Kerala is striving to create employment as well as entrepreneurial opportunities for Keralites including return migrants, in a period when the economy as a whole is contracting.

Tourism

The State government has announced one-time financial assistance of Rs10,000 to 328 tourist guides who are rendered jobless because of the pandemic and a one-time maintenance grant of Rs 80,000 to Rs 1.20 lakh to houseboats based on the number of rooms in them.

The relief was also provided to the homestays, which have been moved from the commercial category to the residential category. This allows the facility some relief in the house tax amount to be remitted to the local bodies. Administrative sanction of Rs 32.80 lakh had been given to assist approved tourist guides at the regional, local, state, and national levels. After construction works were allowed there was a concerted effort to complete the infrastructure creation project at major tourism spots.

Transport

With the onset of the Covid19 induced lockdown, Kerala State Road Transport Corporation (KSRTC) actively intervened to assist the Keralites stranded in other parts of the country. It conducted special services to transport 400 persons, including students stranded in various parts of Karnataka (Gulberg, Mangalore, Mysore and Bangalore) outside Kerala to different parts of Kerala. Similar special services were conducted to help the students stranded in Theni and Madurai in Tamil Nadu

KSRTC also provided bus services from Palakkad and Thrissur Depots to transport persons who came by train from outside Kerala, including migrant labourers, to isolation centres at Palakkad and Thrissur. Special services were provided at airports for travel needs of those persons coming from abroad.

The special service of KSRTC was used extensively for the transfer of the sick and non-infected persons to the isolation centres and other camps in different parts of the state. Special services were also undertaken as per the directions of the District Collectors for the travel of health sector officials.

Though lockdown was partially relaxed with effect from May 3, 2020, the public transport system was only allowed from May 20, 2020. To ensure that the people have adequate transportation facilities available to them, the KSRTC started to operate a limited number of services as per the direction of the government by complying the Covid-19 protocol. From June 9, 2020, KSRTC gradually started to operate more services.

Power

Ever since the start of the spread of the pandemic in the State, Kerala State Electricity Board Limited (KSEB) has switched its priorities. Providing service connections for Covid-19 mitigation facilities being set up by the government and maintaining uninterrupted supply to all its consumers took precedence over all others. A contingency plan was put in place to ensure essential staff in operation and maintenance wings. Standby teams were constituted including contract workforce or retired employees.

While strengthening the Centralised Call centre, KSEB also decided not to disconnect the supply on the grounds of non-payment of the electricity charges, till further orders. Grace periods were allowed and interest for delayed payment was waived during the grace period. Domestic consumers were allowed to make part payment. Non-domestic consumers who were billed based on average consumption were given an option to remit 70 per cent of the bill amount. HT and EHT consumers were also allowed to remit their electricity bills for March and April 2020 up to May 16, 2020, without claiming interest for delayed payment.

KSEB has decided to absorb the transaction charges for online payment of electricity bills through payment gateways from April 20, 2020, to July 31, 2020. Those who were using an online facility for the first time for remitting their electricity bills were offered five per cent cash back (subject to a maximum of Rs.100 per bill) between May 04, 2020, and December 31, 2020. KSEB also waived the application fee for new service connection applications submitted online for one year.

As per the directives of the Government of Kerala, a rebate of 25 per cent on the fixed charge was allowed to industrial and commercial consumers and private hospitals for March, April and May 2020 (during lockdown period). Industrial and commercial consumers and private hospitals were also given the option to defer the payment of balance fixed charge (75 per cent) of these months (March to May), up to December 2020, without levying interest during the deferred period.

Labour Welfare

The Government of Kerala came out with a scheme to provide 68,02,984 workers with membership in 16 different labour welfare boards with Rs 943.20 crore as immediate assistance to address the financial problems faced by labourers during the lockdown. All registered labourers were provided Rs 1,000 as relief fund. Welfare boards with better fiscal standing have

sanctioned more funds. Welfare pension for four months, including April, was sanctioned in a lump sum. Government sanctioned over Rs 58 crore to almost four lakh labour welfare society members registered with societies under various government departments.

Members of Abkari Workers Welfare Board was provided Rs 5,000 as financial aid and Rs 10,000 as interest loan. Under the Motor Vehicle Workers' Welfare Board, bus workers were provided Rs 5,000, goods vehicle workers Rs 3,500, and taxi workers Rs 2,500. Auto rickshaw and tractor workers and automobile workshop workers were provided Rs 2,000 and Rs 1,000 respectively. Members of the 'Toddy Workers' Welfare Fund Board were provided Rs 5,000 assistance and Rs 10,000 as an interest-free loan. Construction workers and farmers, who are members of their respective welfare boards, were provided Rs 1,000. Beauticians (approximately 40,000) who are part of the welfare fund boards were provided Rs 1000.

The Kerala Dairy Farmers Welfare Fund Board distributed pensions to dairy farmers. Special relief scheme for the farmers who had to pour out milk from March 1, 2020, to March 20, 2020, at Rs 1 per litre of milk poured and a maximum of Rs 1000 per farmer has been distributed. An allowance of Rs 10,000 each for Covid affected farmers and Rs 2,000 for farmers who are under quarantine is also being distributed

Civil Supplies

Ensuring that the people have enough food materials and no one is going hungry remained a priority of the Government of Kerala throughout the lockdown period and even after. The Government of Kerala provided kits with 16 items to all rationcard holding households in the State in the April in the wake of the COVID-19 lockdown. The components of the special grocery kit (Athijeevana kit) contained 16 items listed below.

Items	Quantity
Sugar	1 kg
Tea	250 g
Beans	1 kg
Chickpea	1 kg
Coconut Oil	500 g
Atta	2 kg

Cornflour	1 kg
Chilli Powder	100 g
Coriander Powder	100 g
Dal	250 g
Turmeric powder	100 g
Fenugreek	100 g
Mustard	100 g
Soap	2 nos
Sunflower Oil	1 litre
Urad Dal	1 kg

A total of 84,48,016 ration cards were provided with the Athijeevana kit. The scheme-wise distribution of Athijeevana kit is given below:

Sl.No	District	AAY	PHH	NPNS	NPS	Total
1	Thiruvananthapuram	62452	388642	257896	201728	910718
2	Kollam	48114	284307	188121	198597	719139
3	Pathanamthitta	23523	102728	107499	92843	326593
4	Alappuzha	40426	239843	151610	137890	569769
5	Kottayam	35048	163808	168879	127555	495290
6	Idukki	32359	121137	64015	67436	284947
7	Ernakulam	37361	250017	257694	271583	816655
8	Thrissur	52388	280858	213181	260751	807178
9	Palakkad	47571	305880	185192	181107	719750
10	Malappuram	52934	378198	201057	297807	929996
11	Kozhikkodu	38768	280884	199174	224917	743743
12	Wayanad	49652	66737	44806	51585	212780
13	Kannur	35514	164628	189298	216458	605898

14	Kasargodu	30323	101648	74934	98655	305560
	Total	586433	3129315	2303356	2428912	8448016

Athjeevana kit was provided in April as a one-time provision.

In addition, Government of Kerala provided an Onam kit in August 2020 containing 11 items — Sugar(1 kg), Green gram(500 gm), Jaggery(1 Kg), Chilli powder(100 gm), Coriander powder (100 gm), Turmeric powder (100 gm), Sambar powder (100 gm), Coconut oil (500 ml), Pappad(1 packet), Vermicelli/Payasam ada (1 packet) and broken wheat (1 kg).

From September 2020 onwards the Government of Kerala started providing grocery kit containing eight items — Chickpeas (750 g), Sugar (1 kg), Atta (1 kg), Coconut oil (500 ml), Chilli powder (100 g), Salt (1 kg), Green gram (750 g), Dal (250 gm). Eight-item kit will be distributed each month from September 2020 to December 2020 to all ration cardholders.

Monthly rations distributed from April to September 2020, in million tonnes (MT), is given in the table below.

Month	Total rice distributed (regular +PMGKAY+Normal+ Spl) to all ration cards (AAY, PHH, NPS, and NPNS)	Total Wheat distributed (regular +PMGKAY) all eligible ration cards (AAY and PHH)	Total Atta distributed all eligible ration cards (NPS and NPNS)	% of ration cards availed
April	2,17,025.69	15,709.55	5,698.45	98
May	1,97,881.78	15,536.44	4,572.01	97.3
June	1,92,711.02	15,414.23	7,377.94	90.1
July	1,55,475.33	29,733.28	6,904.21	89
Aug	1,90,253.63	30,502.33	6,436.24	96.1
Sept	1,57,236.22	29,792.84	5,777.24	84.7
Total	11,10,583.67	1,36,688.68	36,766.09	

A total of 11,10,583.67 MT of rice, 1,36,688.68 MT of wheat, and 36,766.09 MT of atta was distributed to the ration card holder from April to September 2020. According to the 2011 census 78,53,754 was the number of households in Kerala, there are 88,80,695 ration card holding households in Kerala as on September 30, 2020.

Students

As part of the measures taken to contain the spread of COVID-19 pandemic, schools were closed on March 10, 2020. To compensate for the cooked mid-day meal which could not be provided to children under the prevailing circumstances, it was decided to provide food security allowance as per provisions contained in National Food Security Act, 2013 and Mid-Day Meal Rules, 2015.

As per Government Order No. 2082/2020/DGE, dated 19.08.2020, Food Security Allowance was given to eligible students, from pre-primary classes to 8th standard. The allowance comprises of the entitled quantity of food grains and the cooking cost due to the child. Food Security allowance was sanctioned for 39 days in April and May 2020 and 15 working days in March, which were lost because of the lockdown. Kits were distributed during June-July.

Food Kit contained rice and nine other grocery items, which was distributed based on the feeding strength of the academic year 2019-20. The kit was distributed through Supply-Co stores. Details are given in the table below.

Section	Items in the Kit
Kit A- Pre-Primary	1.2 kg of Rice + 9 items of grocery worth Rs.297.5
Kit B-Primary (Class 1-5)	4 kg of Rice +9 items of grocery worth Rs.299.5
Kit C- Upper Primary (Class 6-8)	6 kg of Rice +9 items of grocery worth Rs.399.5

The food kit for June, July and August is yet to be distributed.

ICDS food suppliments

Anganwadis were closed as a preventive measure with the outbreak of COVID 19. During the period from March 22, 2020, to September 30, 2020, 517841 children under 3 years and 4,44,175 children in the age group of 3-6 years are given food by Take Home Ration (THR) scheme as

part of Supplementary Nutrition Programme. Accordingly, food items were provided to a total of 9,62,016 children in the above two categories. Anganwadi workers delivered THR at the doorsteps of all beneficiaries. Amrutham Nutrimix was given to children of 0 to 3 years and a kit consisting of rice, green gram, and broken wheat were provided (twice in a month) to children of age 3-6 years.

Migrant workers

Migrant labourers were also provided food and other provision during the lockdown period. Camps were set up to ensure better facilities for the migrant workers. The camps that were set up for the migrant labourers, are of four types.

1. Camps run by District Administration: The workers here are provided with cooked food through the community kitchen run by the LSGD with the aid of voluntary agencies and *Kudumbasree* using their own fund. Adequate provisions are being distributed to those workers who are willing to cook their own food.
2. Camps run by Employer/Contractor: The workers in these camps are ensured with food and other amenities by their employer/contractor. The Officials of the Labour Department oversee the activities.
3. Shelters scattered in Rented buildings/converted as camps: The workers here are provided with cooked food through the community kitchen. Necessary provisions are being disbursed to those workers who can cook on their own by the Labour department officials in coordination with the district administration.
4. Shelters scattered; but workers not willing to join camps: The migrant workers sheltered here are provided with cooked food materials and other provisions by the Labour department officials designated as camp coordinators, as requested.

Food was prepared in 1,165 community kitchens which were started under 1034 Local Self Government Authorities and provided to 9205585 beneficiaries. Out of them, 434280 were migrant workers.

Social Welfare Pensions

The present Government of Kerala streamlined the distribution of the social welfare pensions and paid off the arrears. The pension was gradually increased from Rs. 600 to Rs. 1,300. The number of beneficiaries has also been increased from 35 lakhs to 58 lakhs during this period. In the wake of Covid19, the Government of Kerala increased the social welfare pension by Rs. 100

to Rs. 1,400 and distributed it on a monthly basis as well. These measures will further strengthen our comprehensive social security net.

Kudumbashree

The role of the Kudumbashree in Kerala's Covid-19 fight is multi-sectoral and substantial. Kudumbashree effectively intervened to meet the demand for the masks and sanitizers arising out of the fight against the pandemic. Kudumbashree units started the production of cloth masks from March 15, 2020 onwards and rapidly increased their production. Starting from March 18, 2020, Kudumbashree units also started producing sanitisers.

Kudumbashree in convergence with Local self-governments started Community Kitchen to prepare food and to home deliver to those under home quarantine and for needy people. Joint Liability Groups also supplied their crops to the community kitchens

The government extended credit facility for employment generation by providing loans worth Rs 2,000 crore to self-help groups under Kudumbashree. Under this scheme, known as the Chief Minister's Helping Hand Loan Scheme (CMHLS), each unit would receive Rs 5000, Rs 10,000, or Rs 20,000 based on their financial status. The interest of loan will be borne by the State Government. The tenure of the loan will be 36 months with an initial moratorium of 6 months.

Non-resident Keralites

The role played by non-resident Keralites in the growth of Kerala's economy has been well acknowledged. In fact, Kerala is quite often referred to as a remittance economy. In the light of the economic hurdles this pandemic has created, our non-resident Keralites have returned to Kerala in large numbers. Right from ensuring their wellbeing while they were abroad amidst the COVID-19 outbreak, to arranging for their safe return to Kerala, Government of Kerala have catered to their needs. A COVID Response Cell was set up in NORKA-ROOTS with 24x7 helplines to provide assistance to our migrant citizens. Help desks were set up in 14 countries, across the Gulf, Europe, North America, Africa and South East Asia.

The Chief Minister conducted video conferences on April 5, April 26, and May 23, 2020 with prominent pravasis and representatives of pravasi organisations to ascertain the situation on the ground and bring relevant issues to the notice of the Central Government. Letters were written both to the Prime Minister and the External Affairs Minister to arrange the safe return of those

with expired visas and students whose educational institutions have been shut down owing to the pandemic. It was also requested that the Government of India should provide air fare for those who have lost their jobs, those who have been freed from jails and labourers staying in camps. Priority was sought for those requiring immediate medical assistance, pregnant women and children as well, in returning to India. It was also requested that a rehabilitation package for return migrants should be announced, and that special schemes for their skill development should be administered.

On April 26, 2020 NORKA initiated registration for migrants who wished to return to India. 5,55,074 pravasis registered and their details were handed over to the Ministry of External Affairs. NOC was granted for 2,423 chartered flights. Rs. 57.50 crore has been allotted to provide assistance to those who had returned with valid passport and job visa since 1 January 2020, and were unable to return because of the lock down, at Rs. 5,000 per person. Similarly, for pravasis who came in since, January 2020, and contracted COVID-19 Rs. 10,000 has been issued as medical assistance as part of the Santhwana Scheme. Online medical consultation was made available to pravasis through Quick Doctor and Doctor on Call. An agreement was reached with DHL so that medicines could be shipped to pravasis in foreign countries on a discount.

A project called 'Dream Kerala' has been formulated to reform the existing welfare programmes and to include new ideas, so that return migrants could be benefitted. Measures are underway to take stock of the skills and experience of the return migrants as well, so that programmes could be devised accordingly for their rehabilitation.

The Norka Department initiated multisectoral actions to assist the return emigrants. Along with non-financial measures like Help Desk in host countries and Covid Response Cell in Norka Roots, there were multiple financial measures. An amount of Rs.5000 was provided to return emigrants as immediate assistance. Government sanctioned Rs.57.5 crore for this purpose.

Medical Assistance was provided for Covid affected return emigrants. The return emigrants who tested positive for Covid-19 after reaching the State have been provided with an amount of Rs.10,000.

NDPREM (Norka Department Project for Return Emigrants)

To provide a livelihood for return emigrants by promoting self-employment ventures Norka Department has been providing interest cum capital subsidy loan up to Rs 30 lakh under NDPREM. Considering the importance of livelihood of the return emigrants Norka Department

proposes to enhance the loan limit from 30 lakh to 50 lakh and interest subsidy from 3 per cent to 5 per cent.

The limitation of the resources and opportunities brought forward by the pandemic made the Government prioritise and sequence the plan to channelise the scarce resources to address the most important needs of the economy. The schemes in the Plan of 2020-21 were sequenced in order of priority so that the resources are utilised effectively.

100 Days, 100 Projects

The Government of Kerala in September 2020 has launched a '100 Days, 100 Projects' campaign. The aim is to complete 100 projects in the State in the next 100 days as part of an action plan. This is expected to boost the socio-economic status of the State during this tumultuous period. There are new challenges as per the changing needs of the people. The campaign will also speed up projects which were delayed due to the pandemic. This action plan includes the fulfillment of the promises made by the government and enhance relief measures.

With all these measures, even while fighting COVID-19 on the one hand, the government hopes to reinvigorate various sectors such as education, health, agriculture, industry, irrigation, electricity, sports, culture, local self-governments and also traditional sectors like coir and cashew on the other. The government is striving to move forward with its commitment to development and social justice even in the midst of this pandemic, so as to realise a Nava Keralam.