



**GOVERNMENT OF KERALA
KERALA STATE PLANNING BOARD**

**FOURTEENTH FIVE-YEAR PLAN
(2022-2027)**

**WORKING GROUP ON
THE POULTRY SECTOR IN KERALA:
CHALLENGES TO GROWTH AND
POLICY SUGGESTIONS**

REPORT

**AGRICULTURE DIVISION
MARCH 2022**

FOREWORD

Kerala is the only State in India to formulate and implement Five-Year Plans. The Government of Kerala believes that the planning process is important for promoting economic growth and ensuring social justice in the State. A significant feature of the process of formulation of Plans in the State is its participatory and inclusive nature.

In September 2021, the State Planning Board initiated a programme of consultation and discussion for the formulation of the 14th Five-Year Plan. The State Planning Board constituted 44 Working Groups, with more than 1200 members in order to gain expert opinion on a range of socio-economic issues pertinent to this Plan. The members of the Working Groups represented a wide spectrum of society and include scholars, administrators, social and political activists and other experts. Members of the Working Groups contributed their specialised knowledge in different sectors, best practices in the field, issues of concern, and future strategies required in these sectors. The Report of each Working Group reflects the collective views of the members of the Group and the content of each Report will contribute to the formulation of the 14th Five-Year Plan. The Report has been finalised after several rounds of discussions and consultations held between September to December 2021.

This document is the Report of the Working Group on “The poultry sector in Kerala: Challenges to growth and policy suggestions.” The Co-Chairperson of Working Group was Dr.P.A.Peethambaran. Dr.R.Ramakumar, Member of the State Planning Board co-ordinated the activities of the Working Group. Sri.S.S.Nagesh, Chief, Agriculture Division was the Convenor of the Working Group and Smt. Kumari Sangeetha K.R., Deputy Director, Agriculture Division was Co-Convenor. The terms of reference of the Working Group and its members are in Appendix 1 of the Report.

Member Secretary

PREFACE

As part of formulation of the 14th Five Year Plan, the Kerala State Planning Board had constituted working groups of experts in all the major sectors. In Agriculture and Allied Sectors, 6 working groups were constituted viz Agriculture and Cooperation, Animal Husbandry and Dairy, Inland and Marine Fisheries, Forest and Environment, Water Resources and Regional Packages. To discuss and frame policies in each of these sectors, the working groups were further divided into 28 Expert Sub-Groups (ESG) with specific mandates.

Each Expert Subgroup held at least three meetings beside one focused group meeting before finalising the report. We, the Co-Chairs, place our deep appreciation and gratitude to all the esteemed members of the ESG for their valuable contributions in preparing the report. We are extremely grateful to Dr. V. K. Ramachandran, the Honourable Vice-Chairperson, Kerala State Planning Board, Dr. R. Ramakumar, Member, Kerala State Planning Board and Sri. S. S. Nagesh, Chief, Agriculture Division for their consistent guidance and suggestions in preparing the report. The drafting team put in commendable work in bringing together all the views and opinions of the members. We sincerely hope the recommendations in the report can lead to important changes in the public policy for the development of Animal Husbandry and Dairy sectors in the State.

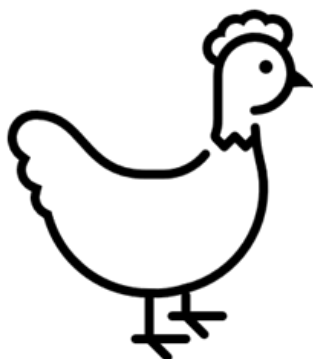
Dr. P. A. Peethambaran
Expert co-chairperson

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THE POULTRY SECTOR IN KERALA - CHALLENGES TO GROWTH AND POLICY SUGGESTIONS

HIGHLIGHTS

- Poultry sector is a lifeline for many small and marginal farmers in Kerala.
- The gaps, threats, and opportunities in the sector have been assessed comprehensively.
- Concrete suggestions and several creative plans have been suggested in this report.

EXECUTIVE SUMMARY

Diversification of poultry production systems with alternate strategies are of paramount importance in Kerala during the 14th Five Year Plan Period. Dispersed production and marketing are the gaps that affect the sector, and the non-availability of chicks and feed are the major constraints. Due to the dependence on other states, the sales of our products at marginal rate could not be achieved. The availability of day-old broiler chicks and egg-type day-old chicks are inadequate and not on par with the existing demand in Kerala. The production of broiler meat, table eggs, and hatching eggs are in sufficient. Hatching facility must be increased manifold. The production of poultry feed within the state has to be given special emphasis. An overview of the suggested policy interventions include

- Launching of skill development centres/ poultry poly-techniques.
- Technology transfer centres/ poultry extension education and entrepreneurship centres/ units in all districts.
- Popularisation of production units/ demonstration units for duck, turkey and quail egg and meat production units and post-production. Improving research and production capabilities.
- Clean, hygienic poultry meat processing is to be established urgently through mini processing units in all LSGs. Cut up chicken ready-to-consume (r to c) centres, deboned chicken meat production units as per HACCP protocol within 20 km of airports with export orientation.
- Location-specific, climate change resilient poultry production in coastal, mid land, and high land regions.
- Marketing network for online niche markets of poultry products.
- Value addition at primary, secondary and tertiary levels.
- Egg collection centres (egg depots) in selected LSGwards.
- Establishment of cold chain.
- Marketing products for bulk use in hotels, hostels, and hospitals.
- Operating poultry feed mills under revolving fund mode.
- Cultivation of maize and soybean to be promoted.

Creative projects that involve backyard farming and the involvement of marginalized groups are also outlined.

CHAPTER 1 INTRODUCTION

Prospects of Poultry Production in Kerala

The Poultry Sector in Kerala has overcome many challenges during the past decade. Diversification of poultry production systems with alternate strategies are of paramount importance in Kerala during the 14th Five Year Plan Period. The poultry sector in Kerala could withstand adverse agro-meteorological conditions owing to its strong base at the grassroots level, with a production of 218 crore eggs and a poultry population increase of 57 lakh during the year 2019-20.

A Road Map to Address the Gaps in the Poultry Sector

The current trends in the Kerala Poultry sector were reviewed and several gaps were identified. The suggestions for improvement include redressal at micro and macro levels. The policy options to address the gaps are also listed briefly.

Dispersed production and marketing are the gaps that affect the sector, and the non-availability of chicks and feed are the major constraints. Due to the dependence on other states, the sales of our products at marginal rate could not be achieved. The availability of day-old broiler chicks and egg-type day-old chicks are inadequate and not on par with the existing demand in Kerala. The production of broiler meat, table eggs, and hatching eggs are insufficient. Hatching facility must be increased manifold. The production of Poultry feed within the state has to be given special emphasis.

Supply of high-quality chicks and high-quality feed is to be ensured. Marginal rate to the producers shall be assured by appropriate mechanisms, and poor and marginal farmers require special attention. Minimum Support Price (MSP) provision is essential. Ascertaining proper marketing channels, assisted by the respective societies, shall be undertaken by appropriate functionaries (to be formulated). The postproduction activities and responsibilities shall be shared by societies and the producers may be relieved from this burden so that they can concentrate on the production process alone.

A network of collection centres is an absolute necessity in this sector. Other requirements include local niche markets, nearby or distant markets, wholesale markets, and convergence with AH Department and LSGD. Feed formulation be made judiciously depending on the CP ratio requirements and seasonal requirements. The efficiency of backyard rearing can be increased by focusing on poultry biodiversity. Integrated DPR will improve proper production, processing, and marketing. To promote retail outlets, we must modernize by enhancing the quality by improving facilities and easy access. A holistic approach is needed, and laws must be strictly enforced.

Infrastructure and Investments Proposed

Establishment of Mega Poultry Projects and Poultry Biodiversity Centres with project estimates of Rs.50 to 100 crores in 50 to 100 acres of land, in regions like Kolahalamedu in Idukki District, Thiruvazhamkundu in Palakkad District and Mundayad in Kannur District are discussed. Hi-tech Broiler Grand Parent Stock Research Stations for developing 'Coloured meat lines and Coloured egg producer lines are discussed in detail. Dual purpose chicken lines for development of improved layers particularly suitable for Kerala have to be evolved. Dependency of White Broilers must be continued until Kerala specific chicken lines are developed. Mega hatchery Complexes with daily hatching capacity of 5000 day-old chicks in the layer and broiler categories is envisaged. The Feed mill capacity in each region shall be in tune with the requirement of feed for all units in the respective Districts. The production, processing, and marketing (ppm) networks shall be the backbone and deciding factor in estimating the profitability.

The mobilization of resource funding by central agencies like ICAR, CSIR, DBT, NABARD, GOI, and LSGD can be ventured. Likewise, capital infusion by NRIs and other appropriate agencies and PPP model aspirants will be convinced of the technical merits and viability of the projects. Support from NRKs in the Veterinary and AH sector may be sought for developing Kerala Poultry Linkages. Such possibilities shall be explored. The investors are permitted to start components like tourism-oriented projects, emu, ostrich farms, turkey, duck, goose, guineafowl production centres and /or its demonstration units, training, research centres, and R and D components comprising short-, medium-, and long-term perspectives also can be considered with objectives of conservation of poultry biodiversity. Small avian species like quails will be categorized for production research with high level pharmaceutical, medicinal, functional, and therapeutic indices. The organic poultry production systems will be provided very high priority, and encouragement will be provided for research on the isolation of lysozyme, immunoglobulin, and inositol phosphates present in egg. The breakthroughs achieved by the KVASU within the short span of 10 years are highly laudable and are of national and international repute. The existing facilities in the Faculty of Poultry Science, the only one of its kind in India, have to be strengthened. The faculty strength in the KVASU is to be doubled, particularly in the Faculty of Poultry Science, as it is most self-reliant, self-sustainable and priority production sector in the State. Technological support and farm advisory services and facilitation cum consultancy services shall be made available to the new entrepreneurs from all technical institutions and laboratories within and outside the state, for testing food safety and security.

Policy Options Suggested in Priority Areas

- Launching of skill development centres/ poultry poly-techniques.
- Technology transfer centres/poultry extension education and entrepreneurship centres/units in all districts.
- For promotion of quail egg and meat production, such units in all LSGs must be created or increased.
- Establishment of a centre for duck production and research in Kuttanad (already

proposed 16 crores)

- Development of grandparent stock of Kuttanad ducks at CASM, Thiruvazhamkunnu.
- Create Rand D centre for ‘avian division of climatology’ at CASM, Thiruvazhamkunnu.
- Clean, hygienic poultry meat processing is to be established urgently through mini processing units in all LSGs.
- Cut up chicken ready-to-consume (r to c) centres
- Deboned chicken meat production units as per HACCP protocol with export orientation to middle east and far east countries are proposed within 20 km radius of airports.
- Popularisation of production units/ demonstration units for duck, turkey and quail egg and meat production units and its post-production technologies are also suggested.
- Doubling of duck, turkey and quail meat production in high ranges
- Climate change monitoring and alleviation.
 - ❖ System wise, location specific, climate change resilient poultry production in coastal, midland, and highland regions.
 - ❖ Biosecurity applications in poultry housing.
 - ❖ Environmental upgradation by protection of nature.
 - ❖ Native fowl conservation strategies with gene pool preservation for future exploitation.
 - ❖ High serum prolactin birds for conserving the broodiness trait in desi/ native fowls recommended.
 - ❖ Establishment of “poultry estate” in tribal village in Attapady.
 - ❖ Rearing of ornamental fowls, fancy fowls .
 - ❖ Marketing network for online niche markets of poultry products is suggested.
 - ❖ Value addition at primary, secondary and tertiary levels is an absolute necessity.
 - ❖ Egg collection centres (egg depots) in selected LSG wards.
 - ❖ Refrigerated/freezer vans can be used for distant marketing.
 - ❖ Ensure (hhh) triangular mode of marketing egg and poultry meat at regular intervals in hotels, hostels and hospitals.
 - ❖ Operating poultry feed mills under revolving fund mode successfully operated in KVASU may be extended to all districts.

❖ Cultivation of maize and soybean to be promoted.

The utilization of Poultry manure with very high value of NPK, production and further processing as pellets and its storage are suggested. Sun drying Cage manure and deep litter manure in summer seasons have to be handled separately.

Manufacture units for 'one lakh homestead cages' suitable for layers, ornamental fowls and quails will be a self-reliant mode of poultry production. It is a decentralized homestead centric planning process in small holder poultry production systems. Chicken deboning centers for women empowerment and employment generation is suggested. Chicken soup recipes for immunity boosting is recommended using cockerel meat production strategies, among geriatric population. Small rendering units and rendering plants at taluk / block level. Standardization of 'cockerel meat production' by free range method of rearing is also advised. Chicken within the fenced compartments/ units. Value addition of spent chicken meat, cut up chicken parts, poultry food park in Kanjikode, Palakkad, conservation of indigenous fowl germplasm of Naked Neck, Kadakanath and Aseel, Frizzled, Bantam, and methods for conservation and scaling up of production also can be formulated.

Applied aspects of EC Housing principles can be met with natural attributes of clean, green and ethical farming during certain seasons in Kerala. The importance of diversification of poultry production systems (PPS), entrepreneurship development and income generation policy options are listed separately. Poultry technician services at doorstep through field supervisors on daily wage basis is suggested. Alternate strategies in PPS in Kerala in tune with the size of landholding is also to be explored. Utilization of alternate species of poultry for further exploitation either for eggs or for meat purpose.

Production processing and Marketing

The production processing and marketing in the broiler sector in Kerala was discussed in detail by the members from KVASU, KSPDC and Department of AH. The Rebuild Kerala Initiative (RKI) outlay of Rs.63 Crores shall be utilized in the 14th Plan period effectively by addressing critical issues involved in the production processing and marketing (ppm) levels. The brand name 'Kerala chicken' is being highly popularized among poultry production and entrepreneurship segments in Kerala. The Kudumbashree and BDS will be able to achieve the targets of 2600 commercial units (sanctioned under RKI) during next two years period provided the speedy and regular fund flow is achieved and the number has to be further enhanced to 5000 in next five year plan. The KSPDC is planning to increase the ppm activities by two fold in the next plan period. Diversification and expansion of the present activities and alternate strategies are discussed for implementation by Brahmagiri Development Society (BDS). Several Research and Development (R and D) Programs are suggested for consideration by KVASU.

Thrust areas have been identified for productivity enhancement of egg and Poultry meat by decentralized 'homestead centric' planning of Poultry production process. One lakh 'homestead cages' with an outlay of Rs.40 Crores can be manufactured in 'poultry polytechniques' during the next five years. The egg and Poultry meat production capabilities of households

can be doubled by providing additional infrastructure facilities and /or by strengthening or by diversification of existing systems of egg and Poultry meat production in all LSGDs by close monitoring mechanisms devised appropriately.

Location specific planning, district-, block-, and grama panchayat-level models are visualized depending upon the collaborators, stakeholders, and beneficiaries. Technological approaches shall be remodelled by formulating the 'Poultry Mission Action Plan for Kerala' in modern lines in tune with the geophysical and topographical peculiarities considering the regional terrine and climate change patterns. Large species of poultry viz; turkey, goose and ostrich production may be oriented in paddocks and hillocks in Wayanad, Palakkad, and Idukki districts.

Small avian species like quail and pigeon production systems will be popularized among farmers in urban and semi urban areas. Chicken breeds suitable for free range, backyard, and organic production systems will be evolved with specific traits giving response to selection par with climate change resilient qualities. Carbon sequestration to the soil in the foraging system will upgrade the environment by default. Under free range method, scattering fowl dropping uniformly in the fields will not degrade the environment. 'Homestead Cage' egg production system with automatic drinking and feeding devices clean egg production in roll away nest will have more acceptability in urban and semi urban sectors. Welfare of households with Poultry manure utilization in the vegetable gardens shall be encouraged. Indigenous fowl germplasm of Naked neck, Aseel, Frizzled and Katakanath will be popularized with technological innovations for tapping its highly qualitative attributes.

Domestic Egg Production

Maximum beneficial attributes shall be exploited and further extended in respect of health care biosecurity and biodiversity for qualitative and quantitative enhancement of both production and productivity, particularly raising the number of 'domestic egg production units' in the State. The utilization of pet birds and fancy birds improve the lifestyle quality by promoting mental health.

Rearing of Strain cross 'hybrid layers' are preferred with special package of management and high-quality nutrition with precision feeding and phase feeding techniques, avoid stressors due to housing, ventilation, climate, and season and follow vaccination procedures and disease control protocols shall be adopted. Skill development and human resource development in tune with technology transfer programs must be increased. Training Centres/ Poultry Poly Techniques must be established for imparting knowledge and developing awareness among public about modern innovative technologies described in the projects listed below.

Under 'organic egg' production system, highly acclaimed nanotechnologies will be incorporated with automatic value addition at the production point itself. Improved chicken varieties with brown egg production potential are suggested. The practice of low input technologies with very 'low investment-high return technology' is a proven success story. Poultry rearing at household sector in Kerala is unique and typical in Vattamkulam and

Ambalappara Panchayats in Malappuram and Palakkad Districts, respectively.

Poultry Egg Production in Kerala

Poultry Development in the country has taken a quantum leap in the last decades and is growing by 15%. 70% of the total production is from commercial Poultry. When the national scenario shows a quantum leap in Poultry production, the situation in our State is also showing a positive trend. Though lots of attempts were made by the government through both State plans and decentralized plans, we could not attain the expected goal of self-sufficiency in egg production. During 1970's Kerala was an exporter of eggs to other parts of the country with Chengannur and Kottarakkara railway stations famous for the centres of rail transport of eggs to other States. So, we were producing more than the demand of the State during those periods but now the situation is that we are importing about 300 Cr of hen eggs and 40 Cr of duck eggs every year and the drain of around 1500 Cr to the neighbouring States.

Kerala is the 9th position as far as the egg production is concerned. Poultry population has gone up from 243 lakhs to 298 lakhs as per the last census report. Though egg production went above 252 Cr in 2014-15, it has shown a declining trend for the past few years (217.68 Cr in last year). Though the Poultry population has increased, it is not reflected in the egg production. **The productivity which was 115.31 in 2014-15 has dipped down to 79.96 in last year.**

As per the ICMR recommendations the average per capita egg consumption should be 180 in adults and 90 in children. Taking into consideration that children account only 20% of the total population, the required eggs for our State is around 550 Crores where as our production is around 230 crores. The shortage is 320 crores. At present the requirement is met by importing eggs from other States. This indicates that there is a potential market for production of more than 300 crore eggs in the State. For the poorest of the poor and the landless, the major issues are food security and risk spreading through subsidiary income, which is to be addressed besides targeted egg production. Many landless and marginal farmers make their living from poultry or small ruminants. Backyard poultry rearing, which needs hardly any infrastructure set up, is a potential tool for the upliftment of the poorest of the poor. Besides subsidiary income generation, rural backyard Poultry provides nutrition supplementation in the form of valuable animal protein and empowers women. It has a very positive impact in improving the socio-economic status of the weaker sections.

Commercial egg production in Kerala is not very viable. However, to meet the requirements, commercial production with feed subsidy should be thought of. Backyard poultry rearing should be strengthened in areas having land for backyard rearing and at the same time, starting small units of commercial farms subsidized by Government. Even for backyard rearing we do not have enough day-old low input technology breed chicks and farmers are depending on the private farms of other States. To produce an additional 300 crore eggs through backyard, we need an additional 166 lakh birds in lay with a productivity of 180 eggs. This means that we need to produce an additional 332 lakh day-old layer chicks per

year in addition to the existing production. So, chick production must be decentralized with more breeder farms and mother farms.

Table 1. Egg production in the State

Year	Egg Production in Crores	Growth %
2006-07	119.39	
2007-08	137.92	15.552
2008-09	150.66	9.24
2009-10	163.30	8.39
2010-11	167.18	2.38
2011-12	170.48	2
2012-13	223.70	31.21
2013-14	247.69	10.72
2014-15	250.36	1.07
2015-16	244.25	- 2.44
2016-17	234.00	-4.19
2017-18	234.81	0.34
2018-19	239.17	1.85
2019-20	218.12	- 8.8
2020-21 provisional	217.68	- 0.2

Source: Economic Review various Years

Table 2. Poultry population

Year	2003	2007	% change	2012	%change	2019	% change
Fowl	109.92 L	142,18 L	29.36	217.11 L	52.69	272.11 L	25.33
duck	6.61 L	9.95 L	50.51	17.09 L	71.31	17.77L	3.96
Turkey				0.51 L		0.276 L	- 46.19
Others, Quails	5.63 L	4.72 L	- 16.2	3.74 L	-20.78	8.02 L	114.63

Source: Livestock Census various years

Suggestions

- Produce as much as day-old chicks through the government hatcheries by rearing more parent stock. The available infrastructure may be fully utilized and by setting up of new breeder farms.
- Start small layer breeder farms under Kudumbashree/ KEPCO/BDS so that hatching eggs can be bought back from them fetching a reasonable income for them and thereby increasing the hatching egg production in the State in an integrated manner

utilizing the funds of central/ State and LSGD funds.

- Setting up of more hatcheries in the State one in each block or Taluk.
- Give more emphasis to people in areas having enough land for backyard rearing and supply maximum birds to beneficiaries in these areas.
- Birds with more productivity of low input technology breeds may be supplied in backyard which will not only help in increased egg production but also Poultry meat production.
- Commercial egg production units may be started in the State and eggs should be bought back and sold under a brand name.
- These commercial farms may be provided with feed subsidy as done in the dairy sector.
- R&D may be done to produce a suitable backyard breed with more productivity and acclimatized to the agro-climatic condition in our State.
- Duck Farming may be expanded with micro units in backyard wherever possible.
- Action should be taken to conserve and develop the germplasm of the Kuttanadan duck breeds Chara and Chempally.
- More quail rearing units may be started as it can be reared in houses in pet bird cages.

Organic Poultry Meat and Egg Production - Export Potential

The primary objectives of value addition of chicken eggs and meat, with ultra high Nutraceutical ingredients like Beta Carotene, Selenium, Chromium, Inositol, Lysozyme with a variety of patterns for 'Quality Enrichment'. The incorporation of pharmaceutical ingredients with the intention of raising therapeutic values of 'Kerala egg and chicken meat' will be sustainable and Good Poultry production Practice in the future. The medicinal properties/qualities on feeding turmeric, ginger, tulsi, karuka (Dhruva or Bermuda grass) and amaranthus, etc. will increase 'export quality' potential of Poultry products. The Maximum Residue Level (MRL) value estimation for Antibiotics and Pesticides in these products will be made mandatory. Such entrepreneurship programs will be superior over commercial ventures in terms of microeconomic and welfare economic policies.

Research, Academic, Extension Education Entrepreneurial Projects with far reaching objectives will be initiated. Extensive 'faculty backup' will also be initiated. Multidisciplinary, Inter University Collaborative Programs are the need of the hour. Tangible results will be attained by establishing a 'Breeder, Hatchery, Feed (BHF) Poultry Integration Complex' consisting of Breeder Unit, Hatchery unit and Feed Mill unit at Kolahalamedu under the KVASU allocating Rs.30 Crores under the Idukki package. Likewise the 'BHF Poultry Complex' also may be established at Pookodu and Kannur under KVASU (in Collaboration with the Kerala Agricultural University and other Universities) under the Wayanad and Kasaragod packages respectively with project cost of Rs. 10 crore each.

Auxiliary/Supplementing/Supporting/Ancillary Activities in Poultry Sector

The natural biological production systems contribute heavily to the 'One Health' profile minimizing health hazards and the extraction Nano molecules from such products in certain cases will venture treatment purpose for Life Style Diseases. The projects enlisted below will have high nutritional security and extra ordinary food safety as adulteration is impossible. Entrepreneurship Development and employment generation among youth and women are highlighted. As Poultry production activities are not cumbersome to handle, the responses and results will be classic exemplary. Poultry Biodiversity will be preserved by widening the species of other avian species. Indigenous duck production is a semiintensive and semi industrial pattern of Poultry production. Innovative technologies and the applied aspects in Poultry Sector like debeaking, vaccination, artificial insemination techniques may be popularized among farmers imparted to the entrepreneurs through Farm Schools and Poly Techniques with a set pattern of curriculum for skill development. Household activities like hatching of eggs using Broody Hens serve the purpose of Mini Incubators in Households. Establishing Egg Depot and Mini, Small Hatcheries executing 'weekly One Hatch' prioritizing Custom hatching, is the key role of 'Kerala Chicken' Production Sector Component in 14FYP.

CHAPTER 2 POLICY SUGGESTIONS

Poultry Meat Production

The first suggestion would be to start more breeder farms in the government sector. Small breeder farms can be set up by Kudumbashree units, BDS, and KEPCO. The hatching eggs can be collected by these agencies and hatched in hatcheries. More hatcheries must be set up under government agencies.

We must increase the number of commercial broiler farms in the state through LSGD schemes and under the government agencies. Minimum support price for broiler birds should be fixed by the government based on the production cost to avoid distress selling and attrition of farmers.

More chicken outlets must be started under government agencies and the price of the products should be uniform. Districts like Wayanad, Idukki, and the eastern districts must be given particular attention as the agro-climatic conditions are more conducive resulting in low FCR and better growth compared to the hot and humid areas.

Domestic egg production

Produce as much as day-old chicks through the government hatcheries by rearing more parent stock. The available infrastructure may be fully utilized and by setting up of new breeder farms. Start small layer breeder farms under Kudumbashree/ KEPCO /BDS so that hatching eggs can be brought back from them fetching a reasonable income for them and thereby increasing the hatching egg production in the State. Setting up of more hatcheries in the state one in each block or taluk. Give more emphasis to people in areas having enough land for backyard rearing and supply maximum birds to beneficiaries in these areas. Birds with more productivity of low input technology breeds may be supplied in backyard which will not only help in increased egg production but also poultry meat production. Commercial egg production units may be started in the state and eggs should be bought back and sold under a brand name. These commercial farms may be provided with feed subsidy as done in the dairy sector. R&D may be done to produce a suitable backyard breed with more productivity and acclimatized to the agroclimatic condition in our state.

Poultry feed production

About 70% – 80% of the cost of production of eggs and poultry meat is the cost of poultry feed. In commercial egg production, the cost of feed alone is 3.55 per egg. The present cost of broiler feed, the feed cost to produce one kilo live chicken is around 67 rupees at 1.6 FCR. At present, the total sale of commercial poultry feed in the state is to the tune of 13000 MT per month including both broiler and layer. These are all supplied by companies from outside the state except for a meagre sale of backyard poultry feed by KFL from its plant at Thodupuzha. If we have to produce 10 lakh broiler birds per day, the requirement of broiler feed alone would be 18750 MT per month and 2.25 lakh MT annually. If the requirement

of AHD for its various farms and both backyard and commercial layer feed are taken in to account, we must produce 15000–16000 MT per month. At present, no government agencies are producing commercial poultry feed in the state compared to cattle feed production by MILMA and KFL. Hence, the government has no control over the poultry feed price in the market and it is the monopoly of private feed companies from other States. KEPSCO started two mash type feed plants at Kottiyam and Kudappanakkunnu for its own use. Both broiler and layer feed were produced from these plants and good results were obtained in broiler birds with FCR of 1.7. Now they are not producing broiler feed as they do not have their own commercial broiler farms, but they are still producing the backyard feed for schemes and layer parent stock feed from these plants. At present only BDS is producing commercial broiler feed from its outsourced feed plant at Mangalapuram. It is high time for the government to intervene in commercial production of broiler and layer feed. There is already a feed factory of pellet type installed at Mala in Trichur district utilizing RKVY and State funds and it is kept idle for the last 5 years. The stand of KEPSCO that it will not be viable cannot be accepted as now KFL has started producing Poultry feed from its plant at Thodupuzha. Either feed production should be started from this plant by KEPSCO else it may be handed over to any other stake holders for full-fledged production. 4800 MT feed can be produced from this plant per month in 2 shifts. KFL may take one shift or two shift production from its Thodupuzha plant. Warehouses may be leased from Kerala State Warehousing Corporation for stocking the raw materials in surplus seasons as there will be volatile price changes of major ingredients like Soya and Maize. Marketing of Poultry feed can be done through the present KFL agencies so that it will help them to get an additional income and there by easing out of the procedures for starting new agencies. Not only broiler but also backyard layer feed is in good demand in the market. Broiler, layer, duck, turkey, quail, and aqua feed can be produced from these plants and marketed. Since BDS is now in the feed market, assistance may be given to them for augmenting feed production.

Production processing and marketing linkages

At present the production, processing and marketing is mainly in unorganized sector. Only less than 5% is in organized sector. Besides production by farmers, integration production is also there in our State. The birds produced by farmers are mostly sold to middlemen and they distribute this to retailers for selling through their outlets. The integrator sells it directly to the retailers. In the case of individual farmers, the middlemen decides the price of chicken and they take a margin and the retailers take their margin before reaching to the customers. At times, farmers are forced to distress selling as keeping the birds for more days will end up in bigger loss. So, if the retail price of the live chicken is 100 rupees the farmers get less than 80 rupees only. This often results in attrition. In integration, though the farmers are not at risk of distress selling they get an average rearing charge of 7.5 rupees per kilo only. This is a meagre amount considering their investment in infrastructure development and labour cost. At present BDS is only giving rearing charges from 9-11 rupees. Kudumbashree also is giving around 9 rupees per kilo compared to 6-8 by private integrators. Processing is also mainly in the unorganized sector as 96% of birds are unscientifically processed by Poultry butchers. Only less than 4 % is scientifically processed, packed,

and sold as fresh, chilled and frozen meat. KEPSCO has a processing plant to process 250 birds per hour, BDS has two processing plants to process 1000 birds per hour and MPI has the capacity to process 250 birds per hour. KVASU also has a processing plant of 250 birds per hour capacity. All together we have the capacity to process 1750 birds per hour only. So, the forward linkages need to be further strengthened for both processing and marketing. Marketing is now done through private retail outlets and the outlets of the government agencies (Both fresh, chilled and frozen) and 96% is in unorganized sector. More processing plants and outlets by government agencies may be started and the full capacity utilization may be ensured from the present plants. As part of maintaining the cold chain mechanism more cold storage facilities may be set up so that excess birds can be processed and stored to avoid distress sales.

Retail outlets

As mentioned earlier 96% of chicken outlets are in the unorganized sector. Here the birds are unscientifically processed and sold as meat. This is a country method of butchering and the blood is not drained out instead its mixed in the flesh. Blood cannot be digested by human intestinal system and the efforts taken by the body to digest it will increase the metabolic activity resulting in loss of calories. More over blood in the flesh makes it unhygienic and increase the bacterial load. Even government agencies selling live birds through their outlets are also doing the same procedure which should be avoided. The present facet of the live chicken outlets should be changed by slaughtering the birds using killing cones so that the blood is drained and then cutting the flesh using portioning machines within a glass chamber. This will avoid blood contamination and make it more hygienic. Since glass chamber is used, customer can see the processing of birds and make this a premium product compared to the country method of butchered birds. Facilities for sale of chilled meat can also be made available in these outlets. The name of outlet should be changed as Kerala Chicken Shoppe for all the government agencies.

Quality and safety of poultry products

Quality and safety of Poultry products can be ensured by scientific processing and packing as mentioned earlier. Antibiotic treatment or feeding should be stopped 5 days before catching the birds Salmonella and E.coli presence in the meat should be avoided by maintaining good shed management and ensuring the quality of chicks, feed and water. Supervision of veterinary surgeon twice in one batch will be worth for ensuring the quality and safety. Traceability of meat will make it a premium product for which there is a provision in the existing Kerala Chicken Project Random samples may be tested for antibiotic residues using the facilities at SLMAP in Marad under A.H department. Quality of feed also can be tested for proximate principles, Aflatoxins, etc. in the approved labs.

Waste management

This is a major concern in Poultry meat processing and without addressing this Poultry industry cannot move forward. There are few dry rendering plants in the State owned by private people and some government agencies. Under government agencies, MPI, BDS, KVASU have rendering plants at present. In Kerala Chicken Project there is provision for 5

more rendering plants. The Poultry waste must be collected from the source and transported to the rendering units and rendered so that this meal can be used as pet food and Poultry feed ingredient. A certain amount can be collected from the private chicken outlets for this purpose. Reefer vans and cold storage facilities are required for this purpose. Two rendering plants in each district may be set up initially and extended to more areas according to the necessity arising.

CHAPTER 3 CURRENT TRENDS IN POULTRY SECTOR

Poultry meat production: demand and Supply

The present demand for Poultry meat in the State per day is 1400 Tonnes. This requires 10 lakh birds per day. Our internal production is only less than 500 Tonnes. The gap is 900 Tonnes. This means that there is an inflow of 9000 T (6 lakh birds). To produce 10 lakh birds per day, we need 10.5 lakh day-old broiler chicks per day (315 lakh chicks per month). This requires 366 hatching eggs per month. The monthly production of day-old chicks in Government sector is somewhere around 3.2 lakh day-old chicks (1.2 lakh by KEPSCO and 2 lakhs by BDS). The output from private hatcheries are around 40 lakhs per month (They are procuring H.E from private companies outside the State). So, the gap is 270 lakh day-old chicks in one month which are now brought from other States. In order to increase the internal production of Poultry meat in the State, a project was sanctioned under RKI to the tune of 63.11 Cr (KERALA CHICKEN PROJECT) but it is yet to take off in full swing. What was envisaged in the project was to increase the stake of Poultry meat market in the State by 5% in the first year and 20% by second year by the Government agencies which is less than 1% in 2019-20. With implementation of this project additionally 6 lakhs chicks can be produced per month (1.5 by KEPSCO and 4.5 by BDS). Other stake holders have not yet come up with new breeder farms in the State. Even then the supply demand gap of day-old broiler chicks will be huge. The grant parents of main breeds of broiler like Ross and Cobb are with private companies. We have not yet developed a competitive breed in our State so far. Regarding broiler commercial farms in Government sector Kudumbashree owns 200, BDS -120 and KEPSCO – contract farms. All other farms are in unorganized sector which includes individual and private integration farms.

KVASU feed production

From the year 2006 onwards the feed for all regional Poultry farms under AHD are being supplied from the feed production unit under RF Poultry Project, Centre for Advanced Studies in Poultry Science, and from the year 2017 onwards from the feed production unit, Avian Research Station, Thiruvazhankunnu also. Altogether these two units under KVASU produce and supply around 2800- 3000 MT of Poultry feeds per year to AHD farms

CHAPTER 4 FORMATION OF POULTRY CO-OPERATIVES

Poultry sector being one of the most promising sectors of food production in Kerala, organization of unorganized sectors can play a key role in promoting Poultry Production Processing and Marketing systematically. Self-reliance and self-sufficiency can be increased in Poultry sector by direct intervention at grass root level. 'Poultry Farmer Groups' (PFGs) in each LSGD under the supervision of the Veterinary Surgeon in every Panchayat can start new production activities effectively. KSPDC, PSU, KVASU must facilitate the supply of high-quality broiler and egg type day-old chicks (DoC) at reasonable price, regularly, as per the requirement. Establishment of 'Poultry Parlor cum Eco shop' will exercise marketing with the support of Kudumbashree and KSPDC. All the Poultry farmers will form the links to form a chain service in the respective Poultry production groups (PPGs). Feed and other consumables including medicines may be made available through Kudumbashree and KSPDC.

License Fee may be waived by the Panchayats for all the members in the PFGs and PPGs. Poultry Entrepreneurs may be classified under the Agriculture sector by enforcement of law and thereby the bank loans up to Rs.3 lakhs at the rate of 4 % interest can be availed, like agriculture loans. Poultry house construction loans may be sanctioned by the Kerala bank and service co - operative banks. The Interest for the Poultry Loans may be paid by the Govt. as a Subsidy in order to promote Poultry as a Vocation in Rural and Semi Urban sectors.

In order to attract more youth in to the Poultry sector, a novel approach of production oriented performance package for confidence building is to be prepared. This in turn will create employment generation. NABARD Loan of Rs.56000, and the procedure for subsidy loans may be made liberal. More stakeholders will undertake Poultry production systems, if direct support by the Government is extended to the farmers for developing Confidence in production activities. These farmers after starting the new units, will form Poultry producer cum marketing Societies (PPMS). These societies will deal with all post production activities including packing and sale of Poultry Manure at reasonable price. Promote better chance of marketing produces, by-products including manure which is presently being sold cheaper and the income from this component /by-product is meager. A 'manure dryer' has to be designed suitably by the Agriculture Engineering Division. For the purpose drying, pelleting and packaging manure, thereby the demand will be increased by several folds and the income from this item will be accounted high.

The 'micro level planning at the 'lowest level' of production as per the unit size and volume of operation, for increasing the income from the egg and meat production can be raised substantially during the 14 FYP. Apex societies must monitor the lower societies very closely on daily basis thereby correcting the shortfalls immediately then and there. Never allow the negative factors to accumulate in the units. Stress should be minimized. All the PFGs should be made vibrant at every point by the Veterinary Surgeon and by the field supervisors from time to time. KSPDC and Kudumbashree must be able to mitigate

the real problems of PPGs. A 'Mobile Poultry Clinic' exclusively set up under the Society with ultra-modern lab facilities also may be designed for providing door step services like vaccination, artificial insemination, treatment, disease surveillance including post mortem services in the Poultry Units, as it is a most urgent and an inevitable service, as well.

The PPGs and Societies should impart Trainer services, highlighting the importance of self-help, mutual assistance, earning and learning attitudes, reducing the cost items of expenditure, there by increasing income and returns, by critical analysis, action system. SOAR analysis and PESTLE analysis will improve the business over and above Error finding techniques in and most critical applied aspects of Poultry Rearing. Analytical templates most suitable in Poultry Rearing shall be applied. SOAR Analysis, SWOT and PESTLE analyses will reveal that the Strength and Opportunities are very high in all Poultry Sectors in Kerala even under the non-industrial mode of production segments. The threats and weakness will be addressed appropriately through the societal leadership. Hence the formation of Poultry Co-operatives in all LSGD s will provide impetus in the production sectors of Poultry enterprise in the State.

CHAPTER 5

SELF-SUFFICIENCY IN EGG PRODUCTION IN KERALA

As per the Kerala development report 2021 States domestic production is about 218 crore eggs annually and our imports from neighbourhood States is about 254 cr. If we can produce 75 lakh eggs a day we will be self sufficient and that is the declared mission of the State government as per the manifesto. There are two strategies to attain this goal.

Production in masses

Highly industrialized and commercialized layer Poultry farms involving intensive cage rearing systems usually done by commercial entrepreneurs using commercial layers laying 330+ eggs in 50 weeks of production is happening in other States and countries. It requires huge finance capital and bird population in each farm would be in lakhs to attain economics of scale. The producer will be making hardly 30 paise per egg as profit and one bird at the end of economically viable laying will be assuring only Rs 100 to the investor per bird. Though it is commercially viable/rather lucrative there are no commercial layer farms in Kerala due to lack of associated industries like hatcheries, central grower units, feed mills. Considering all these and due to high production cost compared to other States, the question will be same again regarding the viability in large scale commercial farming in our State.

Production by masses

Kerala is a land of alternatives models. Production by masses must be the strategy on a very large scale through people's participatory approach all over Kerala if 10 to 15% of households in every Panchayath puts in efforts and political will and sustained commitment to attain a backyard Poultry population of 1.5cr to 2.0cr so that at least 75 lakh eggs/ day can be attained. This involves backyard layer production systems with 10 to 30 layer birds according to land availability and mainly feeding on human food waste (pre and post cooking) and scavenging on insects and vermin supplemented with greens and grains according to availability and growth.

All the government farms under Animal husbandry department, veterinary university and KSPDC maybe producing around 15-20 lakh female chicks annually at the most and scaling up these infrastructure to produce 1.5 cr to 2.0cr chicks requires huge capital from government as land, construction of breedersheds, hatcheries, feed mills establishment of govt approved egger nurseries under private ownership to rear the birds up to 45-60 days etc and takes a lot of time even with finance capital.

What is the alternative?

Broiler industry has flourished in Kerala since late 90's though with the up's and downs with private capital since there is profit in the industry. Covid 19 pandemic associated lock downs, shutting down of hotels, catering units, tourism and restrictions on pompous marriage functions has catastrophically hit the broiler industry along with the exemption of tax on Poultry after implementation of GST. The chances of revival is bleak according to the major players in industry and most of their chick placements have gone down and is

reflected as increase in broiler meat prices which has actually doubled and the farm rate is above 140 Rs during recent times.

This is an opportunity and if State government can motivate, authorize to repurpose these broiler farms, and hatcheries to produce layer chicks and grow them up to 45 -60 days by bringing in layer hatching eggs/layer chicks female from anywhere possible in India these private capital and infrastructure as well as skills in rearing birds and marketing acumen of broiler farmers and integrators can be efficiently utilized to attain self-sufficiency in egg production within a very short time span.

If we could form farmer producer companies involving broiler integrators their desperations can be addressed, and allocate various districts/Panchayaths to these FPC's the above said backyard Poultry distributions can be implemented and self-sufficiency in egg production and even market linkages to sell surplus productions can be done in an all-inclusive model.

Kerala government's role will be as an organizer, facilitator and regulator, who will be monitoring the interest of each and every stake holder during the implementation of the project. It should be through mutually agreed and signed memorandum of understanding to distribute exclusively female birds at prefixed rates @ c120 per bird, to buy back male birds if any at prefixed rates @ reasonable rates and to implement egg packaging, labelling and collection at Rs. 5.50 /egg in paper pulp cartons for six eggs, transportation and marketing of backyard eggs at fixed rates Rs.7/egg in paper pulp cartons of 6 eggs.

The same farmer producer company should replace the layers free of cost or at nominal charges for the continuity of this project and the expenses can be to an extent met from converting the birds into meat and meat products suitable for its relatively fibrous texture.

Various phases of implementation of this project.

1. Decision to implement this project taken by the State government after conducting required discussions at ministry and department (LSGD& AHD) level.
2. Appointment & authorization of State level and district level nodal officers and a small team by deputation from various departments.
3. Investors (broiler integrators and broiler association representatives) meet to motivate, clarify, and assimilate suggestions on the feasibility/ workability of the project.
4. Official declaration of project through press and passing of government orders to various departments, investors to general public regarding the specific details and requesting their cooperation and investment in time and money for the fruition of the project.
5. District level meeting for the formation of farmer producer companies under the leadership of district collector and district animal husbandry officer and other

district level officers of LSGD, Kudumbashree mission, under the chairmanship of elected peoples representatives.

6. Selection and approval of required number of FPC's based on their infrastructure, financial capacities, marketing abilities and credibility. Allocation of various Panchayaths for each FPC, MOU must be signed legally and a security deposit for that matter must be thought of.
7. Organization of meetings at Panchayath level to motivate, clarify and assimilate peoples suggestions. Collection of 1200 Rs with proper receipts and depositing it in accounts maintained in cooperative banks /nationalized banks for future transactions. Installations of cages to provide night shelter, provisions of clean drinking water using nipple drinkers in empty plastic bottles etc. Arrangement of soft loans through Kudumbashree, cooperative banks, joint liability groups and all other alternative financial possibilities including donations from philanthropist agencies or individuals must be organized at Panchayath level (other than plan fund allocation unless decided by the Government)
8. Distribution of birds. Utmost care must be taken to distribute only female birds, as presence of cocks in the flock or even in neighbourhood would result in mating and adversely affect the shelf life of egg on marketing and consumer complaints may result if the eggs are not refrigerated. We have 140 legislative constituencies, and each constituency should populate 1.4 lakh to 2 lakh birds, which means the bird units of 10 birds need to be placed in at least 150 households of every ward. Municipalities and Corporation wards may be exempted because of urbanization or land limitations.
9. Rearing of birds. Predation especially by street dogs, and other carnivorous feral will contribute to loss of birds, a robust night shelter, and stockmanship is the only solution. The setup must be adequately weather proofed. Vaccinations, deworming, sanitation of water and litter must be incorporated. Feeding on household waste depends on available food waste which is a variable to each and every household and varies on a daily basis (pre- and post-cooking) in general food waste from one human being/day is sufficient for one bird. Birds depending on its nutrition and development of reproductive system may come to lay at around 24 weeks and at around 30-32 weeks may reach its peak production. Packaging, collection and marketing must be planned under the guidance of the team in each Panchayath by the FPC. State would have equipped to attain self-sufficiency on completion of phase 9.

Egg imports will continue until phase 9. By this time, consumer preferences must also be modified in favor of brown backyard eggs. This might require exclusive egg shops, supplying backyard eggs for noon meal program, anganavadis, hospital meals etc, and even home delivery systems and campaigns for locally produced eggs by farmers, students, Kudumbashree, youth clubs and political organisations.

The USP here is that the project is essentially not intended for huge profits. The producer will get Rs. 5.50 per egg, the FSSAI-registered FPC will supply paper pulp cartons to each household and labelling will be done by the farmer; each carton will be marked for traceability, and a trackable farmers code will be stucked/stamped. The producer gets Rs 33/- per carton of 6 eggs. Convenient arrangements can be made for collection and packing, with assemblers being provided an incentive of Re. 1 per carton of 6 eggs. Packaging and labelling costs will be around 2 Rs per carton. The transportation, marketing, accounting, and settling of accounts to be done by the staff employed by the FPC and they will be given 3 Rs per carton. Finally, the retailer will get a higher commission of Rs. 3. Thus, the consumer gets the most nutritive and organic eco-friendly antibiotic free farm fresh eggs produced locally with government monitoring for Rs 42 per carton.

This 10th phase, thus, is when imports can be phased out from the Kerala market.

Economics

The State spends about 5 crore rupees every day for commercial egg consumption which means 1800cr to 2000cr rupees annually. Kerala government can distribute 2 crore layer birds 45-60 days for free with 240 crores of plan fund. Anything given for free is futile and cannot generate peoples participation in masses. Allegations on favouring private interests and corruption charges for channeling public money, scams etc will come up. If government is implementing this project it requires a team effort to involve various stake holders and to collect funds, donations allocating big funds is not the need of hour but it shall maintain a corpus fund of 60 crore (25%) to create confidence amongst various stake holders and all the expenses met from the funds shall be recouped. Or utilize such funds to provide subsidy @ 25%/50%/100% to various sectors within the Panchayath in order to attain set targets in numbers.

CHAPTER 6 ATTAPADY POULTRY ESTATE

Sustainable Income for Attappady Tribal Women through broiler/ egger nurseries farming

As per the Kerala Development Report 2021, Poultry meat and egg has been the fastest growing revenue earning sector. Gross State Value Added (GSVA) of Livestock components have grown from 23 to 26.7% over the years 2012 – 2019. At the same time GSVA in the agriculture sector has fallen from 60 to 53.2%. The Govt. of Kerala envisage a growth of 4% per annum in the Poultry sector as a pre-requisite to attaining sustainable growth in the coming years. The fact that 10 crore broiler chicks are imported into the State annually reveals the huge potential for commercial and community rearing of broiler birds. In 2018-19 the egg production in the State was 218.1 crore and the imports stood at whopping 254.8 crore. Clearly the domestic broiler rearing & layer rearing if managed successfully can bring down the huge difference, thereby improving the financial status of the farmer community.

Attappady region of Palakkad district is a tribal inhabited zone with 192 tribal hamlets or 'Ooru' of which 142 belong to Irulaar, 24 to Mudugar and 19 to Kurumba tribes respectively. According to latest census the women population in this region is 16854. The project intends to utilize the women-power to achieve the target of enhanced Poultry production in the State. Broiler farming/ egger nurseries in the deep-litter method by the private broiler integrators in these farms will provide an employment of at least 100 man days per batch in 35-45 or layers up to 45 days, and 500 man days per shed of 5000 square feet considering 5 batches per shed in an year and thus help tribal women /men of Attappady with livelihood and an annual income of 60000/annum. Construction of 50 sheds of 5000 square feet each in the Poultry estate would require 5.5 crore to 6.25 crore at existing market rates of 220-250 Rs. per square feet. This can be either funded by government/ KIIFB or from private capital from interested broiler investors on BOT basis. 50 sheds if fully operationalized would provide 25000 man days to 250 tribal women/ men 100 man days @ 600 Rs / day, with less than normal rearing charges of Rs.6 per kg of meat produced. (normal rearing charge per kg of meat is Rs 8/- per kg depending on FCR, lower rates are recommended to create investor interest at covid 19 stricken lean time for broiler industry). Other requirements like electricity connections, provision for water supply, offices, minimal roads for transportation of feed and birds require government investment. Attappady receives less rainfall compared to the neighbouring regions and the THI (thermal heat index) is favourable for Poultry rearing. The proximity to Coimbatore district of Tamil Nādu is another encouraging fact due to the larger logistics /feed market opportunity.

Aim

To enhance broiler meat/egger nurseries production in the district of Palakkad. The manure/litter produced must be fully utilized to increase soil fertility of Attappady and thereby agricultural productivity of Attappady.

Objectives

1. To enhance broiler meat production in the selected region of Attapady in the district of Palakkad.
2. To improve soil fertility
3. To supplement livelihood of tribal women.
4. To facilitate social and economic upliftment of tribal women through enhanced earning possibilities.
5. To allow entrepreneurial skills to come to the fore in the tribal women of the locality.
6. To improve nutritional status of women and children in the tribal community of the region.

Target beneficiary

Ayalkoottam / tribal women groups or individuals must be enrolled, and a muster roll must be prepared with above 300-500 individuals from the neighbourhood. Labour must be provided on a turn basis from the muster roll. Basic training on poultry upkeep and cleaning, feeding etc. will be provided by LMTC.

Facilitator

Govt. of Kerala. Building, water and electricity will be provided to the beneficiary units by the Govt. of Kerala. Three sheds of 5000 sq. ft each to be allotted to one Ayalkoottam group. Sheds to be built on Govt. owned land.

Integrators

Govt. or Govt. approved private integrators will bring in quality broiler chicks, feed, medicines, vaccines etc., to run their business. MoU's will be executed for this purpose between Govt. and integrator for a minimum of five years, and all the required management, nutrition rearing and sale of birds is the responsibility of the integrator.

The integrators will also pay Rs. 6 per kg of bird in case of broilers or 12 Rs per bird in case of layers at the office who looks after the labour allotment and settles wages (human resource manager provided from government staff under the ST department formed for this purpose).

CHAPTER 7 PROSPECTS OF DUCK PRODUCTION IN KERALA

Centre for Kuttanad duck Production and research

Duck is one of the earliest domesticated species of Poultry and its rearing started around 4500 years ago. Ducks can grow rapidly in free range; they scavenge in the backyard and paddy field for their nutrient requirement and also resist a number of diseases. They occupy an important position next to chicken in India. duck production is an alternate to chicken production which can contribute substantially to food, income, employment, and social security in a developing country like India. Duck can also be integrated with other farming such as fish farming and/or paddy cultivation.

In Kerala, where different types of farming and livestock production systems are in vogue, duckrearing offers enormous possibilities, and it is a promising enterprise socially and economically. Kuttanad ducks are the indigenous Desi ducks of Kerala which include Chara, Chemballi, Pulli and Blackvarieties. Among these four varieties Chara and Chemballi are the two familiar varieties. They are hardy waterfowl acclimatized to our geographical area and are resistant to many diseases. Even though Kuttanad ducks are dual purpose in nature, they are reared in large flocks in the paddy fields of Kuttanad area mainly for egg production. Although consumers prefer for Kuttanad duck meat for their tasty and nutritious meat, they are not reared by farmers exclusively for meat purpose due to low bodyweight, meat bone ratio and feed efficiency. Presently, exotic meat type duck breeds like Vigova Super-M and White Pekin are reared for meat purpose, but their major drawbacks are the low egg production, high day-old duckling cost and less consumer preference for the white feathered birds. With this objective in mind, University Poultry and duck Farm, Mannuthy have already started producing the meat line of Kuttanad duck under the State plan project. But due to the land, financial and manpower limitations, they are unable to achieve the desired improvement per year.

The 19th quinquennial livestock census (2012) revealed that the duck population of India has comedown by 15% from 23.54 million from the previous census. Kerala occupies 3rd position in duck production after Assam and West Bengal. In 2014, the seasonal nomadic farmers were worst hit by bird flu, which resulted in culling of around 2 lakh ducks. Similar cases were reported in 2016 and also intermittent mortality pattern was seen during this period due to other disease conditions like Pasteurellosis and duck plague. Above all, a total loss of around 50 crores has been estimated in the poultry sector alone due to very recent floods which also destroyed majority of duck population in Kuttanad areas. Hence a duck Research and Extension Centre is the need of this hour to meet the requirements of the farmers for superior quality duckling, duck feed, training on scientific duck farming, a proper disease diagnostic laboratory and ambulatory facility for prophylactic vaccination practices.

Every year, there are several thousands of mortality in ducks due to outbreak of duck pasteurellosis, duck plaque and New duck disease. Lack of knowledge about vaccination

against these diseases, lack of vaccination experts and also improper cold chain maintenance by the farmers or the country vaccination team leads to this loss. If the project is approved, most of the birds will be vaccinated with the help of the educated vaccination team by using Diploma holders in Poultry Production, BSc Poultry Production and Management graduates of Kerala Veterinary and Animal Sciences University.

Around 90 per cent of the ducks are reared nomadically in Kerala, where the ducks fully rely on spilled grains, grasshoppers, slugs, snails, small crabs, insects, mosquito and other larva and small fishes from harvested paddy fields, ponds, water ways, rivers etc. The main problem of this nomadic system is that frequently they encounter the wild migratory birds and contract illnesses like avian influenza. To avoid this problem, proper disease surveillance programme and vaccination of nomadic ducks are the need of this hour to prevent the Kuttanad ducks from mass death. To do this, a team of field workers are needed.

Anticipated Socio-Economic benefits

Every year this institute will produce and distribute 5 lakh ducklings to the needy duck farmers of Kerala. Farmers can produce replacement stock of ducklings from their own eggs by using the hatchery facilities available in this institution. Balanced diet for Kuttanad ducks will be produced and distributed to the needy farmers. Farmers will be trained on scientific management of ducks and the way to control diseases like avian influenza, duck plague, new duck disease and duck pasteurellosis. Young people will be attracted to the duck farming. The field workers will vaccinate the nomadic ducks at farmer's premises and avoid huge loss due to outbreak of the diseases. The disease surveillance programme will tell us the pattern of disease outbreak etc., by which we can take necessary precautions by forecasting the disease outbreaks.

We can evolve a meat type Kuttanad duck line which gains around 2 kg body weight at eight weeks of age with 2.5 FCR and propagate it among the duck farmers of Kerala. We can cross this meat type Kuttanad duck line with the White Pekin males to produce a commercial crossbred gaining around 2.5 kg body weight at eight weeks of age with 2.4 FCR.

We can evolve an egg type Kuttanad duck line which can produce around 280 eggs in a laying year with better feed efficiency. Research on unconventional and traditional feeding of ducks will be conducted to improve the nutritional base of the area. Research on duck product technology will pave way for value addition of duck meat and egg, which will fetch more income to the Kuttanad duck farmers. Research on waste management and efficient carcass disposal methods during mass deaths in the situations like flood and disease outbreak. Research on molecular marker assisted selection (MAS) of ducks will be done to get quick improvement in egg and meat production per generation. Augmentation of marketing and profit margins to the farmers will be achieved. Overall impact of this project will alleviate the problems of Kuttanad duck farmers, will increase the duck meat and egg production of Kerala and will improve the GDP.

CHAPTER 8

BROILER BREEDER PRODUCTION

Broiler breeder pure lines are developed and improved by conventional mass selection in the nuclear breeding flocks for the past 60 years by the global breeders. The selection is based on quantitative traits like growth rate, breast muscle yield, body confirmation (measured by indirect measurement technologies like real-time ultrasonography, magnetic resonance imaging, computer assisted tomography and echography etc.,) feed conversion ratio, skeletal measurements, skeletal abnormalities like tibial dyschondroplasia, spondylolisthesis and (measured based on gait, morphology and X-ray imaging techniques), livability, disease resistance, heart and liver function (measured by oximetry and plasma levels of cardiac derived troponin-T enzyme to reduce ascites), fertility, hatchability, hatching egg production, plant condemnation along with limited use of molecular genetics. The best way is to incorporate all traits mentioned above in commercial hybrid broilers or layers by crossing different lines (4 to 8 lines) selected for different traits of importance. Transformation of genetic improvement from pure lines to commercial broilers alone needs around 4 years by crossing of great grandparents, grandparents and parents.

Constraints

Broiler breeder farms in hot and humid climate like that of Kerala will lead to increase in mortality percentage, reduction in production and reproduction performance by around 20% which will make the business non-viable. This is the reason why there is no breeder farm located in the western side of the western ghats of India. A large population of (1,00,000) significant numbers of active and reserve sire and dam lines (5 each) is required for exploitation of several component traits and also to reduce the inbreeding effects, which makes it difficult for smaller breeders and governments to contribute in the broiler and layer breeding. From the above mentioned 10 lakh breeder birds, we have to get one crore accurate data for doing selection of right birds for the next generation. We have to select 10,000 females and 2000 males from the 10 lakh (one lakh from each line) pure lines and the remaining should be discarded, which will make huge loss every year. Breeder operation needs several acres (about 1000 acres) of land for infra-structure development. This needs several crores (INR 1000 crores) for purchase of pure lines from the breeders and also to develop infrastructure for the breeders and related activities. There are only three broiler breeders globally, namely Cobb-Vantress (Tyson Foods), Aviagen (Erich Wesjohann group) and Venkateshwara Hatcheries group and five layer breeders including Hendrix genetics, H & N International, Venkateshwara Hatcheries group, BÁBOLNA TETRA Ltd. This monopoly limits our possibility of purchasing pure lines existing in the market to start our venture. Acclimatization of the pure lines purchased from temperate countries is another problem which we have to face.

APPENDIX -1

**PROCEEDINGS OF THE MEMBER SECRETARY
STATE PLANNING BOARD
(Present: Sri. Teeka Ram Meena IAS)**

Sub: - Formulation of Fourteenth Five Year Plan (2022-27) – Constitution of Working Group on Animal Husbandry and Dairy sectors – Revised Proceedings - reg.

Read: 1. Note No. 297/2021/PCD/SPB dated: 27/08/2021
2. Guidelines on Working Groups
3. This Office order of even number dated 08.09.2021

ORDER No. SPB/342/2021-Agri(2) Dated:14.09.2021

As part of the formulation of Fourteenth Five Year Plan, it has been decided to constitute various Working Groups under the priority sectors. Accordingly, the Working Group on **Animal Husbandry and Dairy sectors** is constituted. For the smooth functioning of the Sectoral Working Group (SWG), it is decided to split the Working Groups into Expert Sub Groups (ESG). Hence the Working Group is categorized into Five Expert Sub Groups as indicated in the proceedings. The names of the members of the SWG are indicated under each ESG. The Working Group shall also take into consideration the guidelines read 2nd above in fulfilling the tasks outlined in the ToR for the Working Group.

1. PREPARING KERALA FOR A SURPLUS IN MILK PRODUCTION: A PLAN

Co - Chairperson

1. Dr P. Sudheer Babu, Registrar, KVASU
2. Mr. K. S. Mani, Chairman, MILMA

Members

1. Dr G. R. Jayadevan, Assistant Professor, Dairy Technology, KVASU
2. Dr Archana Chandran, Asst. Professor, Dairy Technology, KVASU
3. Ms Mini Ravindradas, Director, Dairy Development Department
4. Sri K Sasikumar, Joint Director, Dairy Development Department
5. Mr.Prakash, Joint Director (Rtd), Dairy Development Department
6. Ms V. S. Harsha, Assistant Director, Dairy Development Department
7. Dr Denny Franco, Assistant Professor, Agriculture Economics RARS, Ambalavayal, Wayanad
8. Mr K. R. Mohanan Pillai, Karthika, Kottara, Kollam - 691537
9. Dr B. N. Shaji, Assistant Director (Rtd), Animal Husbandry Department
10. Mr Biji. V. Easo, Joint Director(Rtd), Dairy Development Department

Terms of Reference

1. To assess Kerala's progress in increasing milk production over the past decade, and its sufficiency vis-à-vis the domestic demand for milk and milk products.
2. To examine the potential of Kerala to produce a surplus in milk production and suggest measures for policy preparedness.
3. To assess the extent of infrastructural and institutional requirements to meet the challenge of surplus milk production in Kerala.
4. To suggest measures to modernise the functioning of dairy cooperatives in Kerala.
5. To suggest specific measures for diversification of milk use into value added products.

2. INCREASING PRODUCTIVITY AND PROFITABILITY IN LIVESTOCK: CHALLENGES AND PATHWAYS

Co - Chairperson

1. Dr M. R. Saseendranath, Vice Chancellor, Kerala Veterinary and Animal Sciences University
2. Dr Jose James, Managing Director, Kerala Livestock Development Board

Members

1. Dr Patil Suyog Subhashrao IFS, Managing Director, Milma
2. Dr C. Latha, Dean KVASU
3. Dr P. T. Suraj, Associate Professor, Livestock Production Management, KVASU
4. Mr V. S. Padmakumar, Kerala Karshaka Sangham, Anitha Bhavan, Edavakkode, Sreekaryam
5. Mr Koshy K Alex, Deputy Director, Dairy Development Department
6. Dr K. Sindhu, Director, Institute of Animal Health and Biologicals, Palode
7. Dr Murali, Managing Director, Malabar Milk Union
8. Mr N. K. Subramanian, Naduvil Purakkal Veedu, Mullassery P.O, Thrissur
9. Dr Shajil, Assistant Director, Animal Husbandry Department
10. Dr Easwaran, Deputy Director (Rtd), Animal Husbandry Department
11. Dr Binu Prasanth, Assistant Director, Animal Husbandry Department

Terms of Reference

1. To assess the productivity in Kerala livestock sector over the past decade.
2. To suggest measures to improve Kerala's productivity in livestock farming to the levels of best performing states, including through better breeding, feeding and management.
3. To assess the demand and supply of fodder in Kerala and suggest measures to increase fodder production in the short-term and medium-term.

4. To suggest measures to increase investments in larger livestock farms in the State.
5. To suggest measures to improve the system of registration of all livestock in the State, especially dairy animals.

3. EASE OF ENTREPRENEURSHIP IN ANIMAL HUSBANDRY: REFORMS IN POLICY AND ADMINISTRATION

Chairperson

1. Ms Tinku Biswal, Secretary, Department of Animal Husbandry

Members

1. Dr A. Prasad (LPM, KVASU)
2. Dr Sajith Purushothaman, Assistant Professor, KVASU
3. Dr Syam Suraj (AP, DBM, KVASU)
4. Smt. Rejeetha, Deputy Director (IT), Dairy Development Directorate
5. Mr C. P.-Shyjan, Niranjana, Vayalambalam Temple Gate P.O, Kannur 670102
6. Dr. C.V. Thomas, Cherukarakunnel, Kalaketty P.O
7. Dr Pradosh, Assistant Director (Rtd), Animal Husbandry Department
8. Dr Selvakumar, Assistant Director, Planning, Animal Husbandry Department

Terms of Reference

1. To suggest a broad quantitative framework to regularly assess ease of entrepreneurship in animal husbandry in Kerala.
2. To identify the constraints to the flow of entrepreneurial capital into the processing and value addition segments in animal husbandry.
3. To suggest short-term, medium-term and long-term measures to improve the ease of entrepreneurship in animal husbandry.
4. To suggest legal and administrative measures to be initiated at different levels of governance, including LSGIs, to improve the ease of entrepreneurship in animal husbandry.

4. INCREASING MEAT PRODUCTION IN KERALA: THE ROLE OF PUBLIC POLICY

Co - Chairperson

1. Dr A. Kowsigan IAS, Director, Animal Husbandry Directorate
2. Dr B. Sunil, Prof & Head, Department of Livestock Products Technology KVASU, Mannuthy

Members

1. Dr.N.Ashok, Director of Academic, KVASU
2. Dr V. N. Vasudevan, Assistant Professor, Department of Livestock Products Technology KVASU, Mannuthy

3. Dr A. Irshad, Assistant Professor, Department of Livestock Products Technology KVASU, Mannuthy
4. Dr A. S. Bijulal, Managing Director, Meat Products of India
5. Mr A. Krishnaprasad, Chairman Brahmagiri Development Society, AIKS
6. Mr M. Sukumara Pillai, Plamoottil, Pathiyoorkkala, Keerikkad P.O. Alappuzha 690508
7. Dr Janakidas, District Epidemiologist, Animal Disease Control Project, Pathanamthitta
8. Dr T. R. Jayakrishnan, Veterinary Surgeon, Animal Husbandry Department
9. Dr Chandrababu, Veterinary Surgeon, Animal Husbandry Department

Terms of Reference

1. To assess the progress made in Kerala in increasing meat production over the past decade.
2. To assess the overall demand and supply of different types of meat in Kerala, and the level of dependence on inter-State trade.
3. To prepare a roadmap – a Meat Sector Strategic Plan (MSSP) – for increasing meat production in the next decade comprising production, processing and marketing of meat and meat products.
4. To suggest requirements of infrastructure and investment in the development of a value chain in meat, including aggregation, slaughtering, processing, integrated cold chains and retail outlets.
5. To suggest specific policy measures to prepare the State for better hygiene, quality and food safety in the meat sector.
6. To identify specific research gaps in the meat sector and suggest measures to improve the research-extension linkages.

5. THE POULTRY SECTOR IN KERALA: CHALLENGES TO GROWTH AND POLICY SUGGESTIONS

Co - Chairperson

1. Dr P. A. Peethambaran, Professor (Rtd) (KVASU)

Members

1. Dr P. Anitha, Professor & Head, Department of Poultry Science, KVASU, Mannuthy
2. Dr. Harikrishnan, Assistant Professor, Department of Poultry Science, Mannuthy
3. Dr R. Sudhi, Veterinary Surgeon, Animal Husbandry Department
4. Dr Binoj Chacko, Assistant Professor, KVASU
5. Dr Prakash T, Joint Director (Retd), Animal Husbandry Department
6. Dr Vinod John, Managing Director, KSPDC
7. Mr Mohandas, Panavilakom Veedu, Thirupuram P.O, Neyyattinkara -695133
8. Dr A Sajeev Kumar, Programme Officer, Animal Husbandry, Kudumbashree
9. Dr Sunil Kumar, Additional Director (Rtd), Animal Husbandry Department

Terms of Reference

1. To assess the progress made in Kerala in increasing chicken and egg production over the past decade.
2. To assess the overall demand and supply of chicken and egg in Kerala, and the level of dependence on inter-State trade.
3. To prepare a roadmap – as part of the Kerala Chicken Project – for increasing chicken and egg production in the next decade comprising production, processing and marketing.
4. To suggest requirements of infrastructure and investment in the development of a value chain in chicken and eggs, including production, aggregation, processing, integrated cold chains and retail outlets.
5. To suggest specific policy measures to prepare the State for better hygiene, quality and food safety in the poultry sector.
6. To identify specific research gaps in the poultry sector and suggest measures to improve the research-extension linkages.

Convener

Mr. S.S.Nagesh, Chief, Agriculture Division, State Planning Board

Co- Convener

Ms. Kumari Sangeetha K.R, Deputy Director, Agriculture Division, State Planning Board

Terms of Reference (General)


1. The non-official members (and invitees) of the Working Group will be entitled to travelling allowances as per existing government norms. The Class I Officers of GoI will be entitled to travelling allowances as per rules if reimbursement is not allowed from Departments.

2. The expenditure towards TA, DA and Honorarium will be met from the following Head of Account of the State Planning Board “3451-00-101-93”- Preparation of Plans and Conduct of Surveys and Studies.

The order read as reference 3 is modified to this extent.

(Sd/-)
Member Secretary

Forwarded By Order


Chief,
Agriculture Division

To

The Members concerned

Copy to

PS to Vice Chairperson
PA to Member Secretary
CA to Member (Dr.Ramakumar.R)
Economic Advisor to VC
Chief, PCD,SPB
Sr. A.O, SPB
The Accountant General, Kerala
Finance Officer, SPB
Publication Officer, SPB
Sub Treasury, Vellayambalam
Accounts Section, File/Stock File