GOVERNMENT OF KERALA
KERALA STATE PLANNING BOARD

FOURTEENTH FIVE-YEAR PLAN
(2022-2027)

WORKING GROUP ON

A PROGRAMME TO MODERNIZE AND UPDATE STATISTICAL DATABASES IN AGRICULTURE

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 "A programme to modernize and update the statistical databases in agriculture." The Co-Chairpersons of Working Group were Dr.Madhura Swaminathan and Sri. P. V. Babu. 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.G. C. Roshni, Agronomist, 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 support provided by Sri. Jayakrishnan.R and Smt. Shahida. M. N in bringing out this report is appreciated. 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 on agricultural development in the State.

Dr.Madhura Swaminathan
Expert co-chairperson

Sri. P. V. Babu
Official co-chairperson

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A PROGRAMME TO MODERNIZE AND UPDATE STATISTICAL DATABASE IN AGRICULTURE

HIGHLIGHTS

- Available statistical databases have several drawbacks such as the limited coverage of crops in estimating productivity and costs of cultivation, absence of key statistics on homestead production, horticulture, and floriculture, limited availability of information at local, and agro-ecological levels.
- Key areas identified for intervention (1) improving crop coverage and the changes related to current practices, (2) strengthening statistical system, (3) integrating data on an electronic platform, and (4) budgeting for some of the proposals.
- Nineteen recommendations have been made in these key areas.

EXECUTIVE SUMMARY

The Expert Subgroup on "A Programme to Modernize and Update the Statistical Databases in Agriculture" assessed the current status of statistical databases in agriculture. Several gaps in the existing system were observed, such as the limited coverage of crops in estimating productivity and costs of cultivation, absence of key statistics on homestead production, horticulture, and floriculture, limited availability of information at local and agro-ecological levels. Given the scale of requirements in addressing these gaps, the sub-group made 19 recommendations on the following: (1) improving crop coverage and the changes related to current practices, (2) strengthening statistical system, (3) integrating data on an electronic platform, and (4) budgeting for some of the proposals.

These suggestions are:

1. A systematic collection of area, production, and productivity statistics for horticulture (fruits and vegetables) and floriculture.
2. A group of experts may be constituted for developing a methodology for collection of statistics related to homestead farming.
3. CCE (Crop Cutting Experiments) to be conducted for all crops.
4. Cost of cultivation survey must be extended to cover the entire State.
5. The scope of agricultural statistics must be extended to post-harvest data with information on product diversification and component wise marketed produce/ produce from other states.
6. Frequency of reporting to be improved.
7. A group of experts can be entrusted with the task of integrating forest statistics with agricultural statistics.
8. Further improvement on forest statistics to be explored by the DES along with concerned agencies.
9. Strengthen the existing system of DES to collect the required data at Block panchayat level.
10. Appoint data managers at the level of LSGs
11. Further expansion of Malappattam model with alternate collection frames.
12. Modernisation with tab & app and automated data recording with lat-long information
13. Pilot programme on linking land use with Survey number/ thandapperu as the unique key/basic unit for linking the available data bases..
14. Coordination mechanisms among producers of statistics and line departments should be strengthened.
15. The possibilities of providing unit-level agricultural statistics for research can be explored by the DES.
16. Yearly district-level workshop with DES and agri-officials, local self-government officials, and researchers.
17. Constitute a group of experts/pilot project to examine the issues in detail, setting up a data centre for integrating all relevant data, and to build a prototype of the dashboard.
18. Provide additional funding for DES.

19. Allocate funds to initiate a few special studies/expert groups for estimating output on homesteads, aligning forest statistics, preparing a structure for a dashboard, etc. under the aegis of the Kerala Statistical Commission.

1. INTRODUCTION

The Expert Subgroup on "A Programme to Modernize and Update the Statistical Databases in Agriculture" had the following terms of reference:

1. to critically assess the status and robustness of Kerala's statistical databases in agriculture and identify areas of concern.
2. to suggest measures to improve the design, collection, analysis and dissemination of statistical data, such as area, production, yield, costs of cultivation, trade, farm harvest prices, wholesale prices, retail prices, market arrivals and so on, related to agriculture.
3. to provide a framework for a better use of new technologies to improve the statistical system related to agriculture.
4. to suggest ways in which Kerala's statistical system in agriculture should be geared towards meeting the challenges posed by integrated multiple-/inter-cropping based in homesteads and garden lands, apart from wetlands; and
5. to examine the possibilities of integrating all data on agriculture collected by different agencies in a single electronic platform.

The sub-group met on September 10, 16, and 29, 2021, to deliberate on the terms of reference and to prepare the report. Further information on the functioning of the Department of Economics and Statistics (DES), Government of Kerala, the principal agency for collecting and reporting agricultural statistics, and information on previous reviews of statistical systems, existing schemes and projects were obtained by the sub- group. This report is organised in the following sections:

1. review of the existing database of the DES along with identification of gaps.
2. strengthening statistical databases in relation to addressing concerns in quality and for obtaining data on different levels of aggregation/disaggregation.
3. steps to integrate agricultural statistics on an electronic platform, and
4. specific recommendations of the expert sub-group.

2.REVIEW OF THE EXISTING DATABASE OF THE DES ON AGRICULTURAL STATISTICS

The Department of Economics and Statistics (DES), Government of Kerala, is responsible for collecting and reporting agricultural statistics in Kerala under the Government of India sponsored scheme "Establishing an Agency for Reporting Agricultural Statistics" (EARAS). The scheme was initiated in the year 1975-76 with an intention to cover 20 per cent of selected villages in each year and cover the entire state within a five-year period in a phased manner. A revision of the scheme was done in 1987-88 to generate crop statistics at the district level and its break up at the block/municipal/corporation level and the sampling scheme adopted was stratified multistage random sampling method. Further this scheme was reoriented in 1993-94 by adding investigator Zone within block/municipal/corporation to generate Agricultural Statistics at Block /Panchayat level.

The present sampling scheme adopted was stratified multistage random sampling with strata as community development block/municipalities/corporation. Investigator Zones within the block/municipalities/ corporation are the first stage sampling units and clusters within investigator zones are considered as the second stage units. Survey numbers within each selected clusters are the ultimate unit of the sampling.

Coverage of Crop Statistics (Area, Production, Productivity, Cost of Cultivation, and Farm Prices)

The details of the crops covered by the DES for area, production, and productivity statistics are given in Table 1.

Table1 Details of the statistical data currently collected by the DES

Crop groups	Area	Production	Productivity	Periodicity
Food Crops	Paddy-3 seasons Cholam/Jowar, Maize, Small millet, Wheat, Other grains.	Paddy-3 seasons District wise	1. District wise & season wise, irrigated and unirrigated, and local and high yield variety wise. 2. Nil	Yearly
Pulses	Tur/red gram, Other pulses (District wise).	District wise	District wise	Yearly
Sugar crops	Sugarcane, Palmira (Block wise).	Block wise	District wise	

Spices and condiments	Black pepper, Ginger, Turmeric, Arecanut, Tamarind, Clove, Nutmeg, Vanilla, Cinnamon, Garlic (Block wise)	Block wise	District wise	
	Cardamom (District wise)	District wise	District wise	Yearly
Fresh Fruits	Jack, Mango, Banana, Plantain, Pineapple, Papaya Orange, Lemon (big & small), Other fruits (Block wise)	Block wise	District wise	Yearly
Dry fruits	Cashew nut (Block wise)	Block wise	District wise	Yearly
	Tapioca (Season and block wise)	Season wise Block wise	District wise	Yearly
Tubers	Elephant foot yam, Colocasia, Yam, Sweet potato, Koorka, Nanakizhangu, other tubers	Block wise	Sweet potato (District wise)	Yearly
Vegetable	Drumstick, Amarathus, Bitter gourd, Snake gourd, Ladies finger, Brinjal, green chillies, Bottlegourd, Little gourd, Ashgourd, Pumpkin, Cucumber, Payar, Potato, Carrot, Beetroot, Cabbage, Tomato, Cauliflower, Beans, Onion, Other vegetables (Block wise)	Block wise	Nil	Yearly

Oil seeds	Groundnut, Sesamum, Coconut, Others (Block wise)	Block wise		
Fibre drugs and Narcotics	Cotton, Betel leaf, Tobacco, Lemon grass (Block wise)	Block wise	District wise	Yearly
Non-food crops	Fodder grass, Green manure, Other crops, Teak, Medicinal plants (Block wise)	Block wise		

Source: Information provided by the Department of Economics and Statistics, Government of Kerala.

Based on Table 1, we note the following gaps in terms coverage of crops for statistics on area, production, productivity, and cost of cultivation:

1. Productivity of most of the vegetables except bitter gourd, cowpea, and drumstick are not available at the district level and block level and by seasons.
2. Production of most of the vegetables is not available.
3. Productivity and production of tuber crops except tapioca (season wise) and sweet potato are not available.
4. Season-wise area under tapioca is available but the productivity and production data are missing.
5. Production and productivity of cool season vegetables is not available.
6. Productivity and production of dry land and wet land paddy not provided separately.
7. The productivity measures are not provided according to size class of land holding.

The DES collects data on cost of cultivation for some selected crops:

1. Data on cost of cultivation per hectare of the following important 12 crops for small, medium and large farmers are available: 1. Paddy (three seasons), 2.Coconut, 3.Arecanut, 4.Tapioca, 5. Banana, 6. Pepper, 7. Ginger, 8. Turmeric, 9. Pineapple, 10. Bitter gourd (three seasons), 11. Cowpea (three seasons), and 12. Cardamom.
2. DES has also started collecting cost of cultivation of 11 more vegetables from 2020-21. These are: 1. Ash gourd, 2. Cucumber, 3. Snake gourd, 4. Ladies finger, 5. Cabbage, 6. Carrot, 7. Potato, 8. Beans, 9. Beetroot, 10. Garlic, and 11. Tomato.

About the cost of cultivation, the following points were observed as major gaps:

1. Cost of cultivation survey does not fully cover the State. At present only 38 taluks are covered.
2. Cost of production of only few crops is available.
3. Season wise/ block wise (if possible) cost of cultivation data of vegetable crops, cool

season vegetables and all the important and major crops is required (to finalize the procurement price).

At present DES is collecting farm wholesale price of 83 items and farm retail price of 60 items from all taluk centres. Farm harvest price can be collected as per the demand in the present system. However, data on farm harvest price of all the crops especially vegetables, paddy, fruits, is missing and is required for estimating farmer's income.

A major gap in terms of crop-wise data relate to the data on input use in agriculture. There is a need for data on fertilizer consumption disaggregated by organic and chemical fertilizers and plant protection measures (chemical and bio pesticides, and insecticides).

Homestead farming and related concerns

Within homesteads, area under a specific plot survey number is included in the current EARAS data collection system. However, information on whether a survey number/ cluster is a homestead is not recorded in the survey schedule and there is no coverage of homestead land outside these clusters of plots. Given the importance of homesteads in Kerala, this can lead to a situation where homesteads are not adequately captured in the current data collection process. A detailed methodology for collecting information on homestead farming, that suits the conditions in Kerala, is not available at present. There are complexities involved in case of mixed/inter cropping. There is also a need to provide area estimates separately for mono-cropped and inter-cropped plots.

There has been a recent increase in agriculture in urban and peri-urban areas such as grow-bags in rooftop gardens (terrace-based farming). Currently, these are outside the purview of agricultural statistics. However, if there is an increase in such cultivation in future, a methodology for capturing these also have to be devised under DES's efforts.

Horticulture and floriculture statistics

There are three sources for data on horticulture at present. First, Directorate of Economic & Statistics (DESMOA), Ministry of Agriculture, Government of India operates a Centrally Sponsored Scheme "Crop Estimation Survey on Fruits and Vegetables (CES-F&V)" for estimating area and production of horticulture crops.

Secondly, the State Departments of Revenue/ Agriculture/ Community Development or Statistics collect data through crop estimation surveys (GCES).

Thirdly, the National Horticulture Board (NHB) compiles and publishes estimates of area, production and prices of all important fruit and vegetable crops. The data is collected and compiled and brought out in the form of a publication namely Indian Horticulture. NHB collects the area and production data in prescribed format from the State Directorate of Horticulture/Agriculture for commercially important fruits, vegetables and flower crops and from respective Boards with regard to plantation crops.

DES, Government of Kerala, provides area and production estimates of the following crops to the Agriculture department on a quarterly basis which provides the data source for National Horticulture Board. The crops covered under this project are (listed in Table 1): Banana, Jackfruit, Mango, Papaya, Pineapple, Potato, Sweet potato, Tapioca, Areca nut, Cashew, Cocoa, Coconut, Betel leaves, Black Pepper, Clove, Ginger, Nutmeg, Tamarind,

and Turmeric. The district-wise estimates are also provided on these crops at the time of final estimates.

It must be noted that there is a mismatch in the data of CES – F&V and NHB.
There is no source of data on floriculture data at present for Kerala.

Forest Statistics

Forest Survey of India (FSI) is the source for forest statistics. Remote sensing based maps are developed exploiting ground-truthing.

Reports on Forest Statistics for Kerala are prepared by the Department of Forests. In relation to statistics that this group is interested, it provides detailed information on (1) aggregate forest area and forest area by different classification (reserve forest, vested forests, etc. and dense forest, degraded forest, diverted area,) (2) area under forest plantation and for different species of plants, (3) and out-turn of major forest produce, minor forest produce at different levels (division, range, or for the State as a whole).

Information on crops cultivated in encroached lands and under other diverted lands is missing currently. This could be a small area (around 3 % of total land under the Forest Department), but it may be important in areas/blocks with significant forest coverage.

There are also issues with definition of forests. The FSI includes any land above all patches of land with a tree canopy density of more than 10% and more than 1 ha in area, irrespective of land use, ownership and species of trees which makes Rubber, cardamom, coconut plantations, etc. marked as forest. This leads to mismatch of recorded forest land and FSI statistics.

Other Statistics

Table 2 shows the data on land and irrigation collected by DES. Along with these statistics, the department also collects (1) village-wise data through Mission Anthyodaya and (2) data under decentralized round surveys. Both these have important statistical information relevant for agricultural planning at the local level.

Table 2 Details land-related, irrigation, and price statistics collected by the DES

Type of data	Variables covered	Periodicity
Land utilization	Land utilization13 ways (District wise)	Yearly
Irrigated details	Net area irrigated (source wise) and gross area Irrigated (crop wise) District wise)	Yearly
Land Holdings wise data	1.Number and Area of operational holdings by size class (Social Group wise)	Every Five years
	2.Average size of holdings (size class - Marginal, Small, Semi-Medium, Medium & Large)	
	3.Number and area of Operational Holdings according to tenure & tenancy status (Social Group wise (block wise)	

Source: Information provided by the Department of Economics and Statistics, Government of Kerala

The following details are available in village wise –yearly (Mission Anthyodaya data)

1. Number of households engaged majorly in farm activities
2. Number of households engaged majorly in non-farm activities
3. Availability of government seed centres
4. Whether this village is a part of the Watershed Development Project
5. Availability of Community Rain Water Harvesting System/Pond/Dam/Check Dam etc.
6. Does the village has any farmers collective
7. Primary Agriculture Cooperative Society (PACS)
8. Availability of warehouse for Food Grain Storage (Nearest facility)
9. Availability of primary processing facilities at the village level
10. Does the village have access to custom hiring centre (Agri-equipment)
11. Total cultivable area (in hectares)
12. Net sown area (in hectares)
13. Total net sown area: kharif rabi: other
14. Availability of soil testing centers
15. Availability of fertilizer shop
16. Main source of irrigation
17. Number of farmers using drip/sprinkler irrigation
18. Total area irrigated (in hectare)
19. Total unirrigated land area (in hectares)
20. Total no of eligible beneficiaries under Pradhan Mantri Matru VandanYojana
21. No of beneficiaries receiving benefits under Pradhan Mantri Matru Vandana Yojana
22. Total number of eligible households under National Food Security Act (NFSA)
23. Total no of households receiving food grains from Fair Price Shops
24. Total number of farmers registered under Pradhan Mantri Kisan Pension Yojana (PMKPY)
25. Total number of farmers in the age of 18-40 years subscribed to Pradhan Mantri Kisan Pension Yojana (PMKPY)
26. Total number of farmers
27. Number of farmers received benefits under PMFBY (Pradhan Mantri Fasal BimaYojana)
28. Number of farmers received the soil testing report
29. Number of farmers adopted organic farming during 2018-19

Assets created by the local self-governments during the period from 2015-16 to 2019-20 by the use of different plan funds are collected through the decentralized round survey. The year wise data are available at local level in digital format. Following data are available in agriculture sector.

1. Area and production of paddy, coconut, vegetable, banana, tubers, fruits and spices.
2. Details of fallow land utilized for cultivation.

3. Number of agricultural implements and machineries distributed.(no of tractors, mini-tractor, harvesting machine, power tiller, garden tiller, threshing machine, sprayers, replanting machine, brush cutter, coconut climbing equipment
4. Details of name and quantities of fertilizers, pesticides, bio fertilizers distributed
5. Number of newly constructed irrigation wells
6. Number of irrigation pump sets distributed
7. Number of Haritha bhavans
8. Number of grow bags distributed
9. Number of Bio-fertilizer units
10. Number of high breed varieties of coconut plant distributed
11. Number of eco shops
12. Number of Kudumbasree units
13. Panchayath weekly fairs
14. Bio pharmacy
15. Value added production units.

A gap identified in relation to the collection of statistics relates to home-based honey production. Apiculture units are not covered under the current scheme even though forest-based honey production is covered under forest statistics.

3. STRENGTHENING AGRICULTURAL STATISTICS

NEED FOR ESTIMATES AT AGRO-ECOLOGICAL UNIT LEVEL

There is a felt need for statistics at the level of agro-ecological units (AEU) as these are important in terms of cropping pattern etc, and quite distinct in the context of Kerala. The classification of agro-ecological zones and units along with component blocks and panchayats was undertaken by the National Bureau of Soil Survey and Land Use Planning, Bengaluru and Kerala Agricultural University (published as Agro Ecological Zones of Kerala – Delineation and Cropping Pattern by Directorate of Research, Kerala Agricultural University, 2020). At present, there are 23 agro-ecological units in Kerala (Figure A1 and Table A1 in Appendix A).

A few features must be noted in relation to these agro-ecological units (AEU).

1. AEUs like Kaipad (15 panchayats in 3 districts), Marayur hills (3 panchayats in Idukki), Attappady hills (parts of 2 panchayats in Attappady block), and Attappady dry hills (parts of 3 panchayats in Attappady block of Palakkad distict) individually cover less than 1 per cent of geographical area of the state.
2. Many AEUs (smaller AEUs like Kaipad, southern coastal, Pokkali) are distributed in different districts.

For generating estimates at the level of smaller AEUs and those that are spread across different districts, care may be taken for compulsory inclusion of a minimum number of clusters/zones from these AEUs in each district. There are also issues related to linking the cost of production data to the stratification of farming system categories within agro ecological units. These modalities of implementing methodological changes have to be worked out by the DES.

Data generation at local level

Along with the need for data at agro-ecological level, there is a need for adequate data at the level of grama panchayats. The DES has identified constraints in providing data at the level of panchayats and suggested measures for improvement. These are:

1. Small sample size and coverage of the present data collection system-Re-arrange the sample size suitably to get panchayat-level estimates. Technical expert support is required for this purpose
2. Lack of field investigators assigned to each panchayat for conducting field work. One Investigator each may be posted for each panchayat. The expert committee on agricultural statistics headed by Sri. M. Neelakantan (Retired Additional Director General, Ministry of Statistics and Programme Implementation, Government of India) strongly recommended creating an additional 103 statistical investigator posts for EARAS work.
3. Provision should be given to all local self-government departments (LSGD) to create a local work force (as Karnataka is doing) available to assist the Data manager (Statistical Investigator) of the panchayat for the smooth conduct of data collection and field work. Smart phones may be provided to them for date collection and transmission.

Remuneration for work force may be met from the own fund of the LSG.

4. In order to co-ordinate the work of the Statistical Investigator, IT infrastructure facility of the Directorate, district and taluk offices have to be strengthened.
5. New software may be developed for data compilation and report generation.
6. Digitalized land records –like FMB, Litho and BTR. The government of India is insisting on the use of digitalized land records for agricultural data collection.
7. Area, production and productivity data of Horticulture crops may be collected at local level.
8. Area and production details of floriculture crops may be collected at local level
9. Limited data in respect of production and productivity of vegetable and tubers. Crop cutting experiments can be conducted for arriving at production and productivity by engaging additional persons.
10. Season wise and block wise production and productivity of tapioca can be estimated from the existing system.
11. Dry paddy area. The Department has already initiated action to identify area under dry paddy, and its production and productivity
12. Identify the cool season vegetable producing area, its production and productivity
13. Data on inputs used in agriculture. District wise data on fertilizer consumption, plant protection measures, use of agriculture machineries, use of HY seeds, are available in the Agriculture Census of 2011-12.

A major limitation is the inadequate number of investigators at the level of panchayats. These suggestions also point to the fact that coordination with the network of Krishi Bhavans and local panchayats may be improved for preparation of statistics.

While these points relate to the generation of agricultural statistics, with regard to the use of statistics, it must be noted that the data should be made accessible to end users, especially local panchayats. The local bodies are deprived of actual statistics in the present system of vertical data reporting.

A few initiatives have been carried out in the past to generate agricultural statistics at the local level. One such example is the enumeration carried out at Malappattam grama panchayat, which can be used to put in place and scale up statistical systems at the level of local self-governments. Further mechanisms can be thought of to make Malappattam model of local level or decentralised data generation more regular by constituting ward-level expert committees in panchayats.

Other comments on improving Agricultural Statistics

1. There is a need for improving the statistical frame.
2. A general approach of estimating productivity and then multiplying with area estimates for getting production estimates is not valid in case of perennial crops wherein proportion of non-bearing trees is to be considered. Hence the share of non-bearing trees needs to be estimated along with area estimate.
3. Confidence interval of estimates needs to be provided. Since yearly values are just estimates, year to year variations can be due to sampling. So it needs to be given much importance by planners. For long term plans, quinquennial averages may be used.

4. Mechanism for two streams of data generation and integrating them has to be developed: (a) Numbers at block level (existing-sampling based) and (b) maps (geo-spatial data) at individual holding level (proposed-automated enumeration).
5. Data in map form needs to be over-layed with land use (crops/ forest/ roads/ water bodies/barren land) along with data on markets/industrial points, soil fertility maps, weather maps, etc.
6. Mobile/tablet app-based data collection, currently in the phase of implementation, can be utilized for the improving the speed of data collection.
7. The availability of unit-level data collected by the DES for universities, institutes, and individual researchers will help in understanding specific changes at local level, which cannot be addressed by DES at the State or district levels.

The comments made by previous reviews of the existing statistical system (Kerala State Statistical Strategic Plan 2011 and comments made during the Workshop on State-Level Statistics in 2019) can be taken into consideration while preparing necessary changes for strengthening statistical systems in Kerala.

4. INTEGRATING ALL DATA ON AGRICULTURE INTO A SINGLE ELECTRONIC PLATFORM

A dashboard that showcases statistics and real-time information on various aspects of agriculture will provide a useful resource for researchers and policy makers at all levels. An existing dashboard of the Government of Kerala (https://dashboard.kerala.gov.in/agriculture-aims.php) shows data from the Agricultural Information Management System (AIMS).

For building an electronic platform of the scale that we envisage, the following steps are required:

1. identify data sources (products of different statistical agencies, different dynamic sources, etc.),
2. prepare dashboard architecture (levels of disaggregation, how different sources interact, etc.) and frameworks for collecting data, and
3. create systems to store and retrieve collected data (visual presentation).

Identifying data sources

a. Prominent published sources of data (frequency of reporting is annual or more - with a time lag):

1. Annual Reports on Agricultural Statistics by Department of Economics and Statistics, GoK
    a. Land use classification
    b. Area, production, and yield data on different crops
    c. Irrigation
    d. Wholesale farm prices
    e. Rainfall, temperature, etc.
    f. Cost of cultivation data
2. Forest Statistics Reports by Department of Forests, Govrnment of Kerala.
    a. Forest coverage
    b. Quantity, price, and value of various forest products (major forest produce, non-timber forest produce, minor forest produce, etc.)
3. Other relevant information from different departments reported in the Economic Review
4. Agricultural Census (information related to Kerala; frequency of 5 years with the last one in 2015-16)
5. National Sample Survey (NSS) Situation Assessment Surveys (information related to Kerala; frequency of 5 years with the last one in 2018-19)
6. Data on Agricultural Credit (State Level Bankers' Committee, Reserve Bank of India - Annual)

b. Real-time/dynamic data sources (frequency of reporting for most of them is either daily or weekly):

1. AIMS

2. Rice (paddy) procurement data from Civil Supplies Corporation
3. Data from Krishi Bhavans
4. Market arrivals and prices in vegetables markets of Vegetables and Fruits Promotion Council Keralam (VFPCK) and Government-regulated markets (e-Nam may be used)
5. Data on prices from Horticorp
6. Fertilizer prices
7. Information on prices of inputs from KAU (KAU Services website), VFPCK, Department Farms
8. Other cooperative market information
9. Export data pertaining to Kerala (Directorate General of Commercial Intelligence and Statistics, Spices Board)

While these real-time/dynamic data sources may not be statistically representative, it is an important source of information to know about the impacts of shocks like demonetisation, Covid-19, etc.

Dashboard architecture and framework for collecting data

This process involves two levels: (1) extracting data from the published reports prepared by different agencies and (2) integrating real-time (dynamic) sources.

For the first step, providing different levels of disaggregated data is a challenge (eg. forest statistics are reported at the level of divisions and cannot be easily merged with other data reported at level of blocks or districts.

The major difficulty lies in the second step. Real-time data are collected and reported in different places using different software and systems. Uploading them in a uniform format or obtaining data in particular machine-readable format needs a detailed study of these sources.

Systems to store and retrieve collected data

The data can be fed into an existing system (such as the Kerala Government dashboards) or a new dashboard/portal can be developed. Further study is required in ways of displaying the information in a useful manner (tables and charts - but in a user-friendly method) and on storing the collected information in the long term.

5. RECOMMENDATIONS

Improving crop coverage and the changes related to current practices

1. A systematic collection of area, production, and productivity statistics for horticulture (fruits and vegetables) and floriculture has to be undertaken for Kerala. This exercise may adopt the existing methodology developed for the "Crop Estimation Survey on Fruits and Vegetables (CES-F&V)" carried out by the Directorate of Economics, Ministry of Agriculture and Farmers Welfare, Government of India. Related agencies may also approach the Government of India for inclusion of Kerala under this scheme and funding for such statistical exercise.
2. A group of experts may be constituted for developing a methodology for collection of statistics related to homestead farming. This group may look into the current process of data collection under EARAS scheme that covers some homesteads and propose methods to cover homestead farming in other situations. A pilot project for homestead-based data collection can also be instituted based on the recommendations of this expert group.
3. CCE (Crop Cutting Experiments) to be conducted for all crops to get the productivity of vegetables and cool season vegetables at block level and season wise (where applicable) and for other crops.
4. Cost of cultivation survey has to be extended to cover the whole State (remaining taluks) and to other crops for getting cost of cultivation data of all the crops especially for vegetables.
5. The scope of agricultural statistics has to be extended to post-harvest data with information on product diversification and component wise marketed produce/ produce from other states.
6. Frequency of reporting to be improved – especially for the information currently reported annually by the DES.
7. A group of experts can be entrusted with the task of integrating forest statistics with agricultural statistics and to examine the issue of crops cultivated in forest lands. This may include experts from the College of Forestry, Kerala Agricultural University. This group may also look into the feasibility of using remote sensing data to collect information on forest lands.
8. Further improvement on forest statistics such as sub-grouping of evergreen and deciduous forests, collection of data on social forestry and tree species outside the forest as part of survey on area and land use statistics have to be explored by the DES along with concerned agencies.

Strengthening statistical system

9. Strengthen the existing system of DES to collect the required data at Block panchayat level to cover more panchayats and local bodies. There is a need for increasing sample size for deriving estimates at the AEU level.
10. A provision for data managers at the level of local self-government institutions can be explored for strengthening agricultural statistical systems. The data managers would

act as the nodal points within this structure and can liaison with DES statistical investigators and other line departments. The LSGD may explore the feasibility of this proposal.

11. Additionally for local-level statistics, further expansion of Malappattam model can be tried in a few panchayats and alternate collection frames can be attempted in these experiments. A pilot project for the same may be launched for studying the feasibility of scaling up this model.
12. Modernisation with tab & app and automated data recording with lat-long information. This requires that field staff/ investigators be provided with tablet/hand-held devices for data collection and onward transmission of data to the central repository. This also implies that a suitable software be developed for quick data tabulation and report generation. Hardware and software upgradation can be planned using funds from the Central Government in a phased manner.
13. Resurvey of revenue land and digitisation is completed in many of the villages. A pilot programme on linking it to land use with Survey number/ thandapperu as the unique key/basic unit can be initiated for linking the available data bases. (Unique common key for integration of databases is to be decided from land holding/survey number/ house number/ration card/aadhar of family head). Further changes reported in village data base could be linked to this database and automatic generation of land use maps. This information can be used for generation of land use maps over a period of 5-10 years.
14. Coordination Mechanisms among Producers of Statistics and line departments should be strengthened.
15. The possibilities of providing unit-level data collected under the EARAS scheme and other agricultural statistics for the use of agricultural universities, institutions, researchers, and students can be explored further by the DES.
16. A yearly workshop at district level with DES and agri-officials, local self-government officials, and researchers can be organised as a mechanism of Consultation between producers and users of agricultural statistics.

Electronic platform for integrating data

17. Constitute a group of experts/launch a pilot project to examine the issues in detail, setting up a data centre for integrating all relevant data, and to build a prototype of the dashboard. This group may include statistical/data science experts, DES, and agricultural officials. This group will identify sources of data, study the challenges involved, and recommend the method for displaying the relevant data (whether to integrate with the existing dashboard or to go for a new dashboard/portal)

Budgetary implications

18. Strengthening of statistical systems will require additional funding for DES. We need to work out the cost of (a) increase in sample size to provide estimates at level of AEUs and panchayats, and (b) inclusion of more crops like vegetables in surveys. Increased allocations will be required for staff and for technological upgradation.

19. The 14th FYP may allocate funds to initiate a few special studies/expert groups as outlined above (methodology for estimating output on homesteads, aligning forest statistics, preparing a structure for a dashboard, etc). The work may be done under the aegis of the Kerala Statistical Commission.

Appendix A

Figure A1 Agro-ecological Units of Kerala

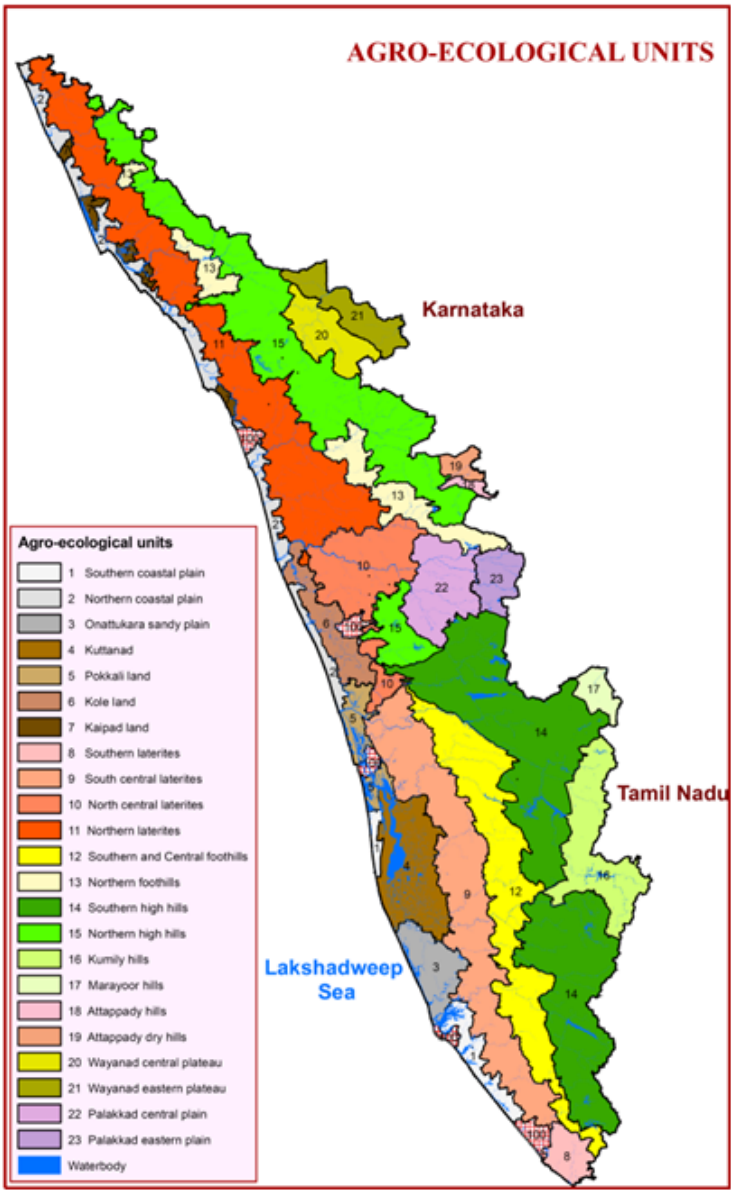

Table A2 Agro-ecological Zones (AEZ) and Units (AEU)

Agro-ecological zone/unit	Area, ha	% of TGA
AEZ I: COASTAL PLAIN	5,09,246	13.10
AEU 1.SOUTHERN COASTAL PLAIN	56,782	1.46
AEU 2: NORTHERN COASTAL PLAIN	1,22,970	3.16
AEU 3: ONATTUKARA SANDY PLAIN	67,447	1.74
AEU 4: KUTTANAD	1,26,931	3.27
AEU 5: POKKALI LANDS	39,765	1.02
AEU 6: KOLE LANDS	71,142	1.83
AEU 7: KAIPAD LANDS	24,209	0.62
AEZ II: MIDLAND LATERITES	10,56,385	27.18
AEU 8: SOUTHERN LATERITES	38,727	1.0
AEU 9: SOUTH CENTRAL LATERITES	3,65,932	9.42
AEU 10: NORTH CENTRAL LATERITES	1,71,469	4.41
AEU 11: NORTHERN LATERITES	4,80,257	12.36
AEZ III: FOOT HILLS	4,60,074	11.84
AEU 12: SOUTHERN AND CENTRAL FOOTHILLS	3,15,893	8.13
AEU 13: NORTHERN FOOTHILLS	1,44,181	3.71
AEZ IV: HIGH HILLS	1,553,225	39.97
AEU 14: SOUTHERN HIGH HILLS	6,72,675	17.31
AEU 15: NORTHERN HIGH HILLS	5,28,434	13.60
AEU 16: KUMILY HILLS	1,50,984	3.81
AEU 17: MARAYUR HILLS	28,968	0.75
AEU 18: ATTAPPADY HILLS	8,872	0.23
AEU 19: ATTAPPADY DRY HILLS	18,495	0.48
AEU 20: WAYANAD CENTRAL PLATEAU	74,471	1.92
AEU 21: WAYANAD EASTERN PLATEAU	70,325	1.81
AEZ V: PALAKKAD PLAINS	1,60,006	4.12
AEU 22: PALAKKAD CENTRAL PLAINS	1,12,957	2.91
AEU 23: PALAKKAD EASTERN PLAINS	47,049	1.21

Note: Yellow and red highlights denote smaller agro-ecological units

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 Agriculture and Cooperation – 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(1) 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 **Agriculture and Cooperation sector** 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 eleven 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. A PLAN TO IMPROVE THE EFFICIENCY OF WORKING OF KRISHI BHAVANS

Co-chairperson

- Dr C. Bhaskaran, Professor of Agricultural Extension (Retd), Kerala Agricultural University
- Mr T. V. Subash IAS, Director, Agriculture

Members

- Dr P. Jayaraj, Programme Coordinator, KVK, Kannur
- Dr Sreevalsan J. Menon, Associate Director of Extension, Directorate of Extension, KAU
- Mr V. G. Sunil, Assistant Professor, Agricultural Extension, Communication Centre, Kerala Agricultural University
- Mr P. V. Jinraj, Assistant Director, Agmark Laboratory, Thiruvananthapuram
- Ms Asha K. Raj, Assistant Director of Agriculture, Small Farmers Agribusiness Consortium, Thiruvananthapuram
- Mr Kariyam Ravi,115 Journalist colony, NCC Nagar, Peroorkada
- Mr G. K. Manivarnan, Agricultural Officer, Pallikkal Grama Panchayath
- Mr R. Ajith Kumar, Assistant Professor, IIITM-K

- Mr Joy Sebastian, MD, VCONSOL
- Mr Sidharthan A.K, Assistant Director of Agriculture (Q C),Kozhikkodu

Terms of Reference

- To assess the present functioning of Krishi Bhavans in Kerala and suggest how to improve their effectiveness.
- To identify advanced technologies for use in Krishi Bhavans to ensure better delivery of services and their convergence with LSGIs, Cooperatives, FPOs, and KAU.

2. A PLAN TO EXPAND AND MODERNIZE SUPPLY CHAINS IN AGRICULTURE

Co-chairperson

- Dr Poornima Varma, Faculty, Centre for Management in Agriculture, IIM-Ahmedabad
- Dr A. Prema, Professor & Head, Department of Agricultural Economics, College of Horticulture, Vellanikkara, Thrissur

Members

- Ms L. R. Arathi IES, Mission Director, State Horticulture Mission, Kerala
- Dr A. Suresh, Principal Scientist, CIFT, Kochi
- Dr S. Jayasekhar, Senior Scientist, Social Science Division, CPCRI, Kasaragod
- Mr Valsan Panoli, Kerala Karshaka Sangham, Vapushas, Koothuparamba, Kannur
- Mr.V. P. Unnikrishnan, MFH Flat No.2003, Vrindavan Garden, Pattom Palace P O Thiruvananthapuram
- Ms Deepthi S. Nair, Deputy Director, Marketing, Coconut Development Board, Kochi
- Dr S. Asharaf, Professor, IIITMK
- Mr Mathew Abraham, Assistant Director, Marketing, Department of Agriculture
- Dr Sangeetha K. Prathap, Assistant Professor, School of Management Studies, Cochin University of Science and Technology, Kochi.
- Ms Chitra K. Pillai, Assistant Director of Agriculture, Agricultural Urban and Wholesale Market, Maradu
- Mr L. Subhash Babu, Deputy Director (Retd.), Department of Agriculture and Farmer's Welfare
- Mr Joy Sebastian, MD, VCONSOL
- Mr Ashar Thattarath, PGP IIM, Ahmedabad
- Mr Manu K.G, Public Relations Officer, Directorate of AD & FW

Terms of Reference

- To suggest a design of a unified supply chain for farm inputs and outputs with specific reference to aggregation/procurement, storage, and marketing.

- To suggest a framework where LSGIs, Cooperatives and FPCs can be effectively integrated into the unified supply chain.
- To suggest ways to ensure that the supply chains are integrated with the objectives of trade, value addition and processing - domestic and global – as well as agricultural finance institutions.
- To suggest ways in which the private agencies in procurement, trade and marketing are integrated with the supply chains.
- To ensure that the supply chains meet the requirements of *niche* sectors, such as organic farming, in certification and traceability.
- To suggest the major technological changes and infrastructural investments required to equip the State's supply chain systems to meet the needs of the farming community as well as domestic and international trade.

3. HOW CAN KERALA DOUBLE ITS VEGETABLE PRODUCTION IN THE NEXT FIVE YEARS?

Co-chairperson

- Ms C. A. Letha. IAS, Secretary, Agriculture, Government of Kerala
- Dr T. Pradeep Kumar, Director (Planning), Kerala Agricultural University, Thrissur

Members

- Dr P. Rajasekharan, Chairperson, State Agricultural Prices Board
- Mr V. Sivaramakrishnan, CEO, VFPCK
- Mr J Sajeev, Managing Director, Horticorp
- Ms L. R. Arathi IES, Mission Director, State Horticulture Mission
- Dr K. M. Sreekumar, Professor of Entomology, College of Agriculture, Padannakkad
- Mr Sridhar Radhakrishnan, Thirunelly Agri Producer Company (TAPCo)
- Mr Reghulal, Deputy Director of Agriculture (Rtd)
- Dr K. Mini, Deputy Manager, VFPCK, Idukki
- Mr Prakash Puthanmadathil, Assistant Director of Agriculture, Vengara
- Ms S. K. Preeja, Kerala Karshaka Sangham, Pallichal, Nemom, Trivandrum
- Mr R Balachandran, Chithiramangalam, Ulloor Medical CollegePO, Thiruvananthapuram,
- Mr Reji Jacob, Kunnamkotu House, Nediyassala PO, Thodupuzha, Idukki
- Ms Bindu.J, Assistant Engineer, Office of the Assistant Executive Engineer, Malampuzha, Palakkad

Terms of Reference

- To assess the progress achieved in increasing area, production, and productivity of vegetables in Kerala over the past five years.
- To suggest a roadmap to double vegetable production in Kerala over the next five years with special focus on increasing productivity and farmer's income.

- To examine the ways in which the institutions of LSGIs, Cooperatives and FPCs can be utilised to participate in vegetable production efforts.
- To suggest ways in which existing systems of vegetable production are modernised and integrated with the different schemes of the government as well as post-production activities.
- To review the existing procurement and distribution systems, including government initiatives, and suggest a transparent, technology-driven platform with the active support of LSGIs, Cooperatives and FPCs.
- To suggest ways to reform the existing government schemes to support vegetable production.

4. CONSTRAINTS TO TECHNOLOGY ADOPTION AND THE POTENTIAL TO RAISE PRODUCTIVITY IN KERALA AGRICULTURE

Co-chairperson

- Dr C. Chandra Babu, Vice Chancellor, Kerala Agricultural University
- Dr K. C. Bansal, Former Director, National Bureau of Plant Genetic Resources, Indian Council of Agricultural Research (ICAR), New Delhi

Members

- Dr M.N. Sheela, Director, CTCRI, Sreekaryam
- Dr C. Thampan, Principal Scientist, CPCRI, Kasargod
- Dr Madhu Subramonian, Director of Research, KAU
- Dr Jacob John, Professor & Head, Integrated Farming Systems Research Station, Karamana, KAU
- Dr P. Indira Devi, Director of Research (Retd), KAU
- Dr R. Beena, Assistant Professor, College of Agriculture, Vellayani
- Dr Archana Sathyan, Assistant Professor, Agricultural Extension, CoA, Vellayani, KAU
- Dr P. Rajeev, Principal Scientist, IISR
- Adv. Thomas V T, Varacheriyil, Pala PO, Kottayam
- Dr Nishanth K. Raman, Assistant Professor, CoA, Padannakkad, KAU
- Mr Rijish Rajan, CEO, Simplified Enterprises Management, Palakkad
- Dr Thomas Aneesh Johnson, Soil Survey Officer, Office of the Deputy Director and Soil Survey, Thrissur (North)

Terms of reference

- To assess the status of productivity of major crops of Kerala and estimate yield gaps.
- To identify linkages between the adoption and use of modern technology and the gaps in yield in major crops.

- To examine the potential for raising productivity in major crops with the existing technologies.
- To identify gap in the availability of technology and suggest measures to hasten the development of these technologies.
- To suggest measures to improve the research-extension linkages in Kerala's agriculture.
- To suggest a policy framework to transform homesteads into profit centres through the practice of technology-driven agriculture.

5. PREPARATION OF SOIL AND LAND USE PLANS IN LSGIs FOR AGRICULTURAL GROWTH

Co-chairperson

- Dr Srikumar Chattopadhyay, Faculty, GIFT
- Mr S. Subramanian IIS, Director, Soil Survey & Soil Conservation, Trivandrum

Members

- Mr T. Gangadharan, Extension Faculty, KILA, KSSP
- Mr K. S. Hiroshkumar, Scientific Officer, IFSRS, Karamana, KAU
- Mr B. P. Murali, Member, Nagaroor, Kilimanoor Block (KBPA)
- Mr R. Sukhalal, Swararagam,Cherthala South PO, Alappuzha
- Mr A. Nizamudeen, Land Use Commissioner, Kerala State Land Use Board
- Mr K.P. Abdussamad, District Soil Conservation Officer, Kannur
- Mr Anand Vishnu Prakash, Agricultural Officer, Manakkad Krishibhavan, Idukki

Terms of reference

- To critically assess the status of preparation of land use plans by LSGIs in Kerala over the past five years and identify the reasons for the poor performance of LSGIs in this regard.
- To suggest and prepare a guidance note for the effective preparation and development of land use plans, and its integration with watershed plans and agricultural production systems.
- To suggest ways to integrate and converge the objectives and activities of multiple government agencies possessing data on land ownership, land use and agriculture to facilitate regular updating of land use plans prepared by LSGIs.
- To suggest a road map for a State-level people's campaign to complete the preparation of land use plans at the LSGI-level over a period of six months.

6. WATERSHED-BASED PLANNING AND AGRICULTURE: THE POTENTIAL IN KERALA

Co-chairperson

- Dr Ishita Roy IAS, Agriculture Production Commissioner
- Mr I. B. Satheesh, MLA, Kattakada Constituency

Members

- Dr K. K. Sathiyan, Dean, KCAET, Thavanur
- Dr Celine George, Senior Principal Scientist & Head, CWRDM, Manimalakunnu
- Dr Anu Mary C. Philip, Assistant Director, Soil Conservation; IWDMK, Chadayamangalam
- Mr S. U. Sanjeev, Assistant Director of Agriculture (Rtd.)
- Mr U. Janardanan, CEO, Mayyil Rice Producer Company Ltd., Kannur
- Dr A. R. Durga, Assistant Professor, Department of Agricultural Economics, College of Agriculture, Vellayani, KAU
- Mr M. Prakasan Master, Kerala Karshaka Sangham, Pranavam, Azheekode South, Kannur
- Mr T. K. Rajan Master, Nini Nivas, Edachery PO, Kozhikode
- Mr Jo Jose, Assistant Principal Agricultural Officer, PAO Office, Kottayam
- Mr Mohanachandran, Deputy Director (Retd), Kollam

Terms of reference

- To critically assess the status of preparation of watershed plans by LSGIs in Kerala over the past five years and identify the reasons for the poor performance of LSGIs in this regard.
- To suggest and prepare a guidance note for the effective preparation and development of watershed plans, and its integration with land use plans and agricultural production systems with active support of geospatial technologies.
- To suggest ways to integrate and converge the objectives and activities of multiple government agencies possessing data on water, water use, land use and agriculture to facilitate regular updating of watershed plans prepared by LSGIs.
- To suggest a road map for a State-level people's campaign to complete the preparation of watershed plans at the LSGI-level over a specified minimum period.
- To study the different successful models of watershed plans prepared by LSGIs in the State and study the possibilities of replications, and preparation of a set of best practices.
- To provide guidance on linking the existing schemes of the government with a broader watershed-based strategy of development planning.

7. A PROGRAMME TO MODERNIZE AND UPDATE STATISTICAL DATABASES IN AGRICULTURE

Co-chairperson

- Dr Madhura Swaminathan, Professor, Indian Statistical Institute, Bengaluru
- Mr P. V. Babu, Director, Dept of Economics & Statistics

Members

- Dr U. S. Mishra, Professor, Centre for Development Studies, Trivandrum
- Ms L. R. Arathi IES, Mission Director, State Horticulture Mission
- Dr Brigit Joseph, Professor, Dept of Agricultural Statistics, CoA, Vellayani
- Dr K. P. Chandran, Senior Scientist, CPCRI, Kasargod
- Mr T. Paul Lazarus, Assistant Professor, Agricultural Economics, CoA, Vellayani
- Dr Pratheesh Gopinath, Assistant Professor, Agricultural Statistics, CoA, Vellayani
- Mr Deepak Mercy Johnson, Senior Fellow, Indian Statistical Institute, Bangalore
- Mr S. Ajayghosh, Vrindavan, Vadakkan Mainagapally PO, Kollam
- Mr Ramesh P K, TA to Director of Agriculture, Directorate of AD and FW

Terms of reference

- To critically assess the status and robustness of Kerala's statistical databases in agriculture and identify areas of concern.
- To suggest measures to improve the design, collection, analysis and dissemination of statistical data, such as area, production, yield, costs of cultivation, trade, farm harvest prices, wholesale prices, retail prices, market arrivals and so on, related to agriculture.
- To provide a framework for a better use of new technologies to improve the statistical system related to agriculture.
- To suggest ways in which Kerala's statistical system in agriculture should be geared towards meeting the challenges posed by integrated multiple-/inter-cropping based in homesteads and garden lands, apart from wetlands.
- To examine the possibilities of integrating all data on agriculture collected by different agencies in a single electronic platform.

8. A PLAN FOR VALUE ADDITION AND INDUSTRIAL INVESTMENT IN KERALA'S POST-HARVEST AGRICULTURE

Co-chairperson

- Dr K. P. Sudheer, Professor & Head, Department of Agricultural Engineering, College of Horticulture, KAU
- Mr Manu George, Strategist, Agency for the Development of Food Processing Industries in Kerala (ADFIK), KINFRA

Members

- Mr Rajeev Bhushan Prasad, Chief Coconut Development Officer, Coconut Development Board
- Dr E. Jayashree, Senior Scientist, ICAR-Indian Institute of Spices Research (IISR), Kozhikode
- Dr Lijo Thomas, Senior Scientist, ICAR-Indian Institute of Spices Research (IISR), Kozhikode
- Dr M. R. Manikantan, Principal Scientist, Harvest & Post Harvest Technology, CPCRI, Kasargod
- Mr K. K. Rajendrababu, Kunnath Veedu, Alappad PO, Thrissur
- Mr R. Manikuttan,Santhivila, Vandanmedu PO, Idukki,
- Dr V. R. Sinija, Professor & Head, Business Incubation Unit, IIFPT, Thanjavur
- Dr M. S. Sajeev, Principal Scientist & Head Crop Utilization Division, CTCRI, Sreekaryam
- Dr P. R. Geethalakshmi, Assistant Professor, Department of Post-Harvest Technology, College of Agriculture, Vellayani
- Ms K. Thulasi, Kerala Karshaka Sangham, Novelty, Matoor, Kalady, Ernakulam
- Dr P. Nisha, Principal Scientist, CSIR-National Institute for Interdisciplinary Science and Technology, Trivandrum
- Mr Abraham John Tharakan, Chairman, Amalgam Foods
- Mr Madathiveetil Ramesh, Director, Brahma Indic Nutriments Private Limited
- Mr Appu Anitha Muraleedharan, Theeram Agro World
- Ms Mini Srinivasan, Annam Flour and Batter Solutions, Coimbatore
- Mr Ajoy Sukumaran, Assistant Director of Agriculture, Directorate of AD and FW

Terms of reference

- To prepare a roadmap for the development of an entrepreneurship-driven system post-harvest value addition in agriculture while ensuring the generation of employment and skills.
- To suggest measures to effectively integrate the functioning of LSGIs, Cooperative institutions, including FPCs, and line departments towards the development of value chains in post-harvest agriculture.
- To suggest measures to ensure facilities for investment, quality control, traceability, logistics and export, including the necessary arrangements for payment systems.
- To suggest measures to augment Kerala's export of processed products, particularly in high value and *niche* segments.

9. EASE OF ENTREPRENEURSHIP IN AGRICULTURE: REFORMS IN POLICY AND ADMINISTRATION

Co-chairperson

- Mr S. Harikishore IAS, Director, Industries & Commerce Department
- Dr K. J. Joseph, Director, Gulati Institute of Finance and Taxation, Trivandrum

Members

- Dr Binoo P. Bonny, Professor & Head, Department of Agricultural Extension, CoA, Vellanikkara, KAU
- Dr K. P. Sudheer, Professor & Head, Department of Agricultural Engineering, College of Horticulture, KAU
- Mr G Prakash, Joint Director, MSME Institute, Thrissur
- Mr Roshan Kynadi, Agripreneur, Kynadi Plantations
- Mr T. Thulasidasa Menon, Krishnakripa,Thrithalangode PO, Malappuram,
- Mr M. Ramesh, Industry Expert, RABI-KAU Incubation Committee
- Mr Saji George, CEO, BIONEST
- Mr Shan Kadavil, MD, Fresh to Home Foods Private Ltd
- Mr Jamsheed, Agricultural Officer, Kannamangalam, Malappuram

Terms of reference

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

10. HOW CAN KERALA USE THE POWER OF COOPERATION TO RAISE AGRICULTURAL GROWTH?

Co-chairperson

- Mr P B Nooh IAS, RCS, Kerala
- Mr James Mathew, Ex- MLA, Taliparamba

Members

- Dr P. S. Geethakutty, Professor (Retd.), KAU
- Mr Salin Thapasi, Project Leader, SFAC

- Mr Paleri Ramesan, Chairman, ULCCS
- Mr James, Perambra Coconut FPC
- Fr John Choorapuzhayil, Chairman, BIOWIN, Mananthavady, Wayanad
- Dr J. Thomas, PDS Organic Spices, Kuttikanam, Idukki
- Mr G. R Rajeev, Kollam
- Mr Bimalghosh, MD, Aralam Farming Corporation
- Ms Rema K. Nair, Deputy Director of Agriculture (Retd.), Department of Agriculture
- Mr V Ravindran, Senior Manager, Kerala Bank

Terms of reference

- To critically assess the role and position of Cooperative institutions in Kerala's agricultural development pattern.
- To identify weaknesses in the cooperative institutional framework with respect to their contribution to the agricultural production processes.
- To chart out a pathway to effectively leverage Kerala's historical strengths in cooperative action – including both cooperatives and farmer producer companies (FPC) – to improve agricultural growth and farmer's income.
- To critically assess the performance of Kerala's cooperative credit system to finance agricultural activities.
- To suggest measures to modernise the functioning of Cooperatives in the State.
- To suggest measures on how cooperatives can contribute to the development of supply chains and value addition in agriculture.
- To suggest measures to improve coordination across line departments, LSGIs, Cooperatives and FPCs to contribute to agricultural growth.
- To suggest measures for transforming Kerala Bank to support the resource needs of the productive sector of the State.

11. COOPERATIVE BANKING IN KERALA: REVAMPING THE ROLE OF KERALA BANK

Chairperson

- Ms Mini Antony IAS, Secretary, Corporation

Co-Chairperson

- Dr Pallavi Chavan, Director, Reserve Bank of India, Mumbai

Members

- Mr Sasikumar M V,Director, Institute of Co-operative Management, Parasinikkadavu, Kannur
- Mr Jose T Abraham, Additional Private Secretary to the Finance Minister

- Mr K. C. Sahadevan, Chief General Manager, Kerala Bank
- Mr V. Raveendran, Senior Manager, PACS Development Department, Kerala Bank
- Mr Raja Kurup, Board Member, Kadirur PACS, Kannur
- Mr Anoop Kishore, Development Standing Committee Chairman, Wadakkanchery Municipality and District Facilitator of Decentralised plan
- Mr Romio Kattapana, President, Thankamony Service Co-operative Bank
- Mr K.C.S Nambiar, Director, Ancharakandy FSC Bank and Sahakari Coconut Processing facility
- Mr P. R. Sanjeev, Managing Director (Retd.), MILMA
- Mr R K Bhoodes Pillai, Chairman, Federation of Indian Cashew Industries, Former CEPCI
- Mr Sudheer K, Additional Director of Industries and Commerce
- Mr Damodhar, President, Kerala State Small Industries Association

Terms of reference

- To suggest broad measures to deepen and expand the participation of the cooperative sector in the process of economic growth of the State, and to involve youth in the cooperative movement in the State.
- To suggest measures to upgrade the use of technology in the functioning of primary cooperatives, such as the introduction of unified software.
- To suggest measures to improve professionalism in the functioning of cooperative societies in the State.
- To prepare a guidance note on Business Process Reengineering of the Kerala Bank to serve as a key provider of resources to the productive sectors, such as agriculture and MSMEs as well as tourism.

Convener

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

Co- Convener

Smt. G C Roshini, Agronomist, 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 TA 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

14/09/21

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