



നാറ്റോണൽ ഫോക്കസ് പേപ്പർ

स्टेट फोकस पेपर

2019-20

State Focus Paper

State : Kerala

राष्ट्रीय कृषि और ग्रामीण विकास बैंक

National Bank for Agriculture and Rural Development

केरल क्षेत्रीय कार्यालय, तिरुवनंतपुरम

KERALA REGIONAL OFFICE, THIRUVANANTHAPURAM



दृष्टि

ग्रामीण समृद्धि के लिए राष्ट्रीय विकास बैंक

ध्येय

सहभागिता, संधारणीयता और समानता पर आधारित वित्तीय और गैर-वित्तीय सहयोगों, नवोन्मेषों, प्रौद्योगिकी और संस्थागत विकास के माध्यम से समृद्धि लाने के लिए कृषि और ग्रामीण विकास का संवर्धन.

VISION

Development Bank of the Nation for Fostering Rural Prosperity.

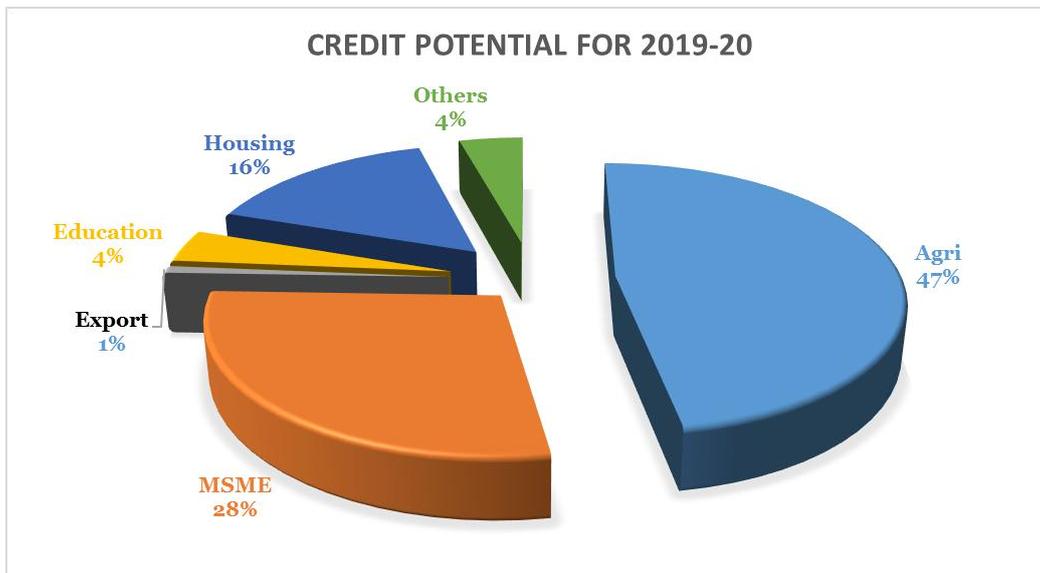
MISSION

Promote sustainable and equitable agriculture and rural development through participative financial and non-financial interventions, innovations, technology and institutional development for securing prosperity.

Sector wise Assessment of Credit Potential 2019-20	
Particulars	Credit Potential (Rs. lakh)
Credit Potential for Agriculture	
Farm Credit	
Crop Production, Maintenance and Marketing	4,760,364.98
Water Resources	118,841.87
Farm Mechanization	105,094.25
Plantation and Horticulture	580,009.97
Forestry and Wasteland Development	21,305.72
Animal Husbandry - Dairy	300,540.29
Animal Husbandry - Poultry	77,292.47
Animal Husbandry - Sheep, Goat, Piggery, etc.	86,639.27
Fisheries (Marine, Inland, Brackish water)	61,336.52
Others - Bullock, Bullock cart etc.	1,088.06
Sub-Total	6,112,513.38
Agriculture Infrastructure	
Construction of storage facilities (Warehouses, Market Yards, Godowns, Silos, Cold Storage units/ cold storage chains)	38,541.91
Land development, soil conservation, watershed development	210,531.95
Others (Tissue culture, Agri bio-technology, Seed production, Bio pesticides/ fertilizers, Vermin composting)	15,871.50
Sub-Total	264,945.36
Ancillary activities	
Food and Agro processing	385,675.43
Others (Loans to Cooperative Societies of farmers for disposing of their produce, Agri clinics/ Agri Business centres, Loan to PACS/FSS/ LAMPS, Loans to MFIs for on-lending)	167,199.96
Sub-Total	552,875.39
Total Agriculture	6,930,334.13
Micro, Small and Medium Enterprises	
MSME - Working Capital	1,582,446.21
MSMS - Investment Credit	2,526,570.89
Total MSME	4,109,017.10
Export Credit	121,520.50
Education	570,288.70
Housing	2,266,054.24
Renewable Energy	26,233.11
Others (Loans to SHGs/JLGs, loans to distressed persons to prepay non-institutional lenders, PMJDY, loans to State sponsored organisations for SC/ST)	555,239.72
Social Infrastructure involving bank credit	37,590.98
Sub Total	3,576,927.25
Total Priority Sector	14,616,278.48

Broad Sector wise assessment of Credit Potential 2019-20

		(Rs.lakh)
Sl. No.	Particulars	Credit potential for 2019-20
I	Agriculture	
A	Farm Credit	
i)	Crop production, maintenance and marketing	47,60,365
ii)	Term loan for agriculture and allied activities	13,52,148
	Sub total	61,12,513
B	Agriculture Infrastructure	264,945
C	Ancillary Activities	552,876
	Credit Potential for Agriculture (A+B+C)	6,930,334
II	Micro, Small and Medium Enterprises	4,109,017
III	Export Credit	121,521
IV	Education	570,289
V	Housing	2,266,054
VI	Renewable Energy	26,233
VII	Others	555,240
VIII	Social Infrastructure involving bank credit	37,591
	Total Priority Sector (I to VIII)	14,616,278



EXECUTIVE SUMMARY

NABARD, as the apex developmental financial institution, is closely associated in the decentralized planning process with the preparation of individual district-wise potential based credit plans, on annual basis. At the state level, 'State Focus Paper' is prepared as an aggregation of all the district level credit potentials made in the Potential Linked Plans (PLPs). The basic objective of such planning exercise is to assess the credit potential keeping in view the sector specific physical potential, availability of enabling infrastructure, forward and backward linkages, local skill, natural resources and credit absorption capacity of the sector.

State Profile

Kerala State situated in the Southern tip of India, covers an area of 38.863 sq.km. The State lies within East longitudes 74° 52' and 77° 22' and North latitudes 8° 18' and 12° 48', and is bordered by the State of Karnataka to the North and North-East, Tamil Nadu to the East and South, and the Lakshadweep sea to the West.

Geographically Kerala roughly divides itself into three climatically distinct regions, these includes the eastern highlands (accounts for 48% of the total land area), the Central Midland (accounts for 40% of the total land area) and the Western Coastal Plains, (covers an area of about 4000 sq.km). The analysis of agro ecology of Kerala is primarily based on climate, geomorphology, land use and soil variability, results into its delineation of 5 agro ecological zones and 23 widely varying agro ecological units with significant yield gaps.

As per 2011 census of India, the State had a population of 334 lakh with a population density of 859/sq.km. More than 53% of the total population of the State is residing in rural areas. The population of Kerala forms 2.76% of India's population in 2011. Children in the age group of 0-6 years constitute 10.40% of the total population compared to 12% during 2001. Malappuram is the most populated district and Wayanad is the least populated district in Kerala.

In addition, Kerala is the home to 3.21 lakh indigenous Tribal Adivasis (1.10% of the populace). Some 63% of tribal reside in the eastern districts of Wayanad (35.82%), Palakkad (1.02%) and Idukki (15.66%).

Total population of the State includes 9.09% of Scheduled Castes and 1.45% of Scheduled Tribes.

Kerala has the highest literacy rate among Indian states, with an effective rate of 93.91 percent. Kerala Ranks 1st in the Human Development Index with a score of 0.784, among other States in the country.

The sex ratio of Kerala is 1084 and has improved by 26 points from 2001, which is much higher than the national average of 940 as per 2011 census.

Banking Profile

Kerala has good banking network which has been steadily growing to cater to ever growing banking needs of the population. As on 31 March 2018, banking network of the State comprised 43 Commercial Banks (27 Public Sector Commercial Banks and 16 Private Sector Commercial Banks), one RRB (Kerala Gramin Bank (KGB), Kerala State Cooperative Bank (KSCB) with 14 affiliated District Cooperative Banks (DCBs), 1647 Primary Agriculture Co-operative Societies (PACS) and Kerala State Agriculture and Rural Development Bank (KSCARDB) with 75 Primary Co-operative Agriculture and Rural Development Banks (PCARDBs).

Banking services in the State are provided through a network of 8909 branches (5717 branches of Commercial Banks and 632 branches of RRB and rest in Co-operative sector including PACS) with per branch population of 4285 persons as against all India average of 11,000 persons. Kerala accounts for 5.0% of the total number of bank offices, 3.53% of the total deposits and 3.15% of the total advances of the country.

Performance against Priority Sector Lending Goals

Item	Tgt. (%)	State Performance (%)						
		Mar 2012	Mar 2013	Mar 2014	Mar 2015	Mar 2016	Mar 2017	Mar 2018
Priority Sector Advances to Total Credit	40	57.34	56.72	59.14	59.68	57.16	56.52	58.74
Agri Advances to Total Credit	18	24.25	25.73	25.42	25.31	19.00	23.08	28.29
CD Ratio	60	75.57	76.41	68.66	68.37	63.89	62.81	75.88

(Source: SLRM 2018)

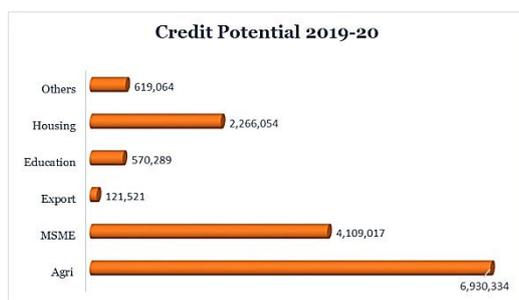
Theme of State Focus Paper

Rapid growth of agriculture is critical for inclusiveness and livelihood security. Even though agriculture accounts for only 9 percent of Gross State Domestic Product (GSDP), it is still the main source of livelihood for the majority of the rural population. The modern agricultural practices which are heavily dependent on the use of chemical pesticides, inorganic fertilizers and growth regulators has raised the agricultural production manifold. The realisation that this rapid increase in production was achieved at the cost of resource depletion, environmental deterioration and loss of crop diversity, lead to the concept of Sustainable Agriculture. The theme of the State Focus Paper for the year 2019-20, hence, is “**Sustainable Agriculture Practices**”. The relevance of sustainable agriculture practices in a state like Kerala which faces extreme pressure on natural resources endowments cannot be over emphasised. One of the Chapters of the Focus Paper is devoted entirely on this subject.

Sustainable Agriculture refers a set of agricultural practices which ensure enhanced production on an ongoing basis without causing ill effects to the carrying capacity of the soil, depletion of resources and environmental degradation.

Sustainable agriculture is in fact the successful management of resources for agriculture to satisfy the changing human needs, while maintaining or enhancing the quality of environment and conserving the natural resources. It is a balanced management system of renewable resources including soil, wildlife, forests, crops, fish, livestock, plant genetic resources and ecosystems without degradation and to provide food, livelihood for current and future generation maintaining and improving productivity and ecosystem services of these resources.

Credit Potential for 2019-20 for Kerala State



The State Focus Paper (SFP) 2019-20 document presents a systematic assessment of credit potential for the Kerala State. The SFP carries granular details of sector-wise, investment purpose-wise credit requirements (*estimated at district level and consolidated at state level*) as also assess the critical

infrastructure gaps and elucidates investment and budgetary support required for infrastructural development.

The total credit under priority sector for 2019-20 in the State has been assessed at Rs.1,46,162 crore. The credit projection for total Agriculture and Allied activities for 2019-20 are estimated at Rs.69,303.34 crore, with the share of credit for agriculture investment activities constituting around 47%.

The Focus areas of the SFP 2019-20 are summarised as under:

Chapter 4 of the document dwells on the sector-wise strengths and opportunities, issues and constraints and the actions required to be initiated by the stake holders to translate the relative strengths and opportunities into development action. A snapshot of the above is given in the following paragraphs.

a) Crop Production

Kerala agriculture is distinct from that of rest of country in terms of resource endowments, land-use and cropping pattern, scale of farming as well as socio-economic factors. The diversity in soil, climate and socio-economic endowments in the state favours cultivation of a variety of crops, contributing to a rich and varied crop cafeteria spread across its length and breadth. Cropping pattern in Kerala is dominated by cash crops, which constitutes 62.46 percent of the total cropped area, while food crops consisting of rice, tapioca and pulses constitute just 9.35 percent. Year on year there has been a drastic reduction in the area of food crops, and under rice recording a drastic decline from 1.96 lakh hectare to 1.71 lakh hectare.

Credit is one of the important supply side factors which contributes to agriculture production. In Kerala, agriculture advances has increased significantly in the last ten year period. As of now, it constitutes 5.64 per cent of the total agricultural advances in the Country. This year credit potential has been estimated on the basis of area under cultivation, additional area that can be brought under cultivation and realistic Scales of Finance.

The potential for credit support assessed for **Crop Production, Maintenance and Marketing for the year 2019-20 is Rs.47,604 crore**, which is 32% of the total allocation under Priority Sector for 2019-20.

b) Water Resources/Minor Irrigation

As against Kerala's total geographical area of 38.86 lakh ha, net sown area is 20.15 lakh ha and gross cropped area is 25.84 lakh ha. Out of this Gross Cropped Area of 25.84 lakh ha, about 4.97 lakh ha is reported to be irrigated (*as per Agricultural Statistics 2016-17*). The gross irrigated area which has been hovering around 18 per cent is below the all India share of about 45 per cent. A rapid expansion of irrigation system is therefore, critical for realizing the full potential of agriculture and enhancing farming incomes. A major constraint in expanding agricultural productivity in Kerala is the lack of irrigation facilities.

The water availability **per capita in Kerala is one of the lowest in the country** and has been declining overtime. The water availability of Kerala is dependent on rainfall and other climatic factors, particularly the spatial and temporal distribution of rainfall. Due to poor retention capacity of the soil, water available through rainfall cannot be conserved effectively. The net annual ground water availability for future irrigation development of the State is 30,364 ha. m.

The stage of ground water development of the State is 47 percent. In spite of large investment, there is still a wide gap in the creation and utilisation of irrigation potential across various types of irrigation systems. Infrastructure investment in the water sector includes expenditure on major and medium irrigation, minor irrigation and flood control and coastal zone management. The recent floods in Kerala has caused damages to check dams, terraces and water harvesting structures, which calls for an immediate drought proof management system. New farm ponds/ rainwater harvesting structures may also be promoted to maximise water availability.

The potential for credit support assessed for **Water Resources for the year 2019-20 is Rs.1,188 crore**.

c) Farm Mechanization

To ensure efficacy in farm operations and reduction of drudgery, farmers are showing interest towards farm mechanization. With the typical labour scenario prevalent in Kerala, selective mechanization can help the farmer in getting better returns. Further, due to the rising cost of labour during peak period of farming, farm mechanization is gaining significant in Kerala. Selective mechanization can help the farmer in getting better returns.

Govt. of Kerala has different schemes to encourage farm mechanization. Through these schemes an individual farmer can purchase agricultural implement in a subsidized rate. Also an entrepreneur can purchase

implements in subsidized rate for setting up Custom Hiring Centres (CHC). The Farm Mechanization System (FMS) developed by NIC Kerala is a new boost in implementing ICT in the Department of Agriculture, Kerala. Govt is providing subsidy for farm mechanization under Rashtriya Krishi Vikas Yojana (RKVY) and Sub-Mission on Agricultural Mechanization (SMAM).

The potential for credit support assessed for **Farm Mechanization for the year 2019-20 is Rs.1,051 crore.**

d) Plantation and Horticulture

Kerala produces about 89.51 M.MT of horticulture produce from an area of about 13.87 m. HA and accounts for 3.22% of the total horticulture production in the country. Kerala stands first in production under plantation crops with an output of 5347.87 MT (provisional) during 2016-17 contributing to 32% of the total share of the country's production.

Plantation and Horticulture crops have a major stake in Kerala's economy as around 90 per cent of the net cropped area is under these crops. **Kerala has a substantial share in four plantation crops** of rubber, tea, coffee and cardamom. These four crops together occupy 7.04 lakh ha, accounting for 27.29 percent of the gross cropped area in the State. Kerala accounts for 5.03 percent of the area and 6.3 percent of the total domestic production of tea in the country.

The potential for credit support assessed for **Plantation Horticulture for 2019-20 is Rs.5,800 crore**, which is 9% of the total allocation under Priority Sector for 2019-20.

e) Forestry and Wasteland Development

The total notified forest area of the State is 19,239 sq.km, which is more than 50% of the total geographical area of the State of 38,863 sq.km. Idukki has the most forest cover (3770 sq.km) followed by Palakkad (1761 sq.km). Forests in Kerala form part of one of the 32 biodiversity hotspots in the World. As water scarcity becomes more and more acute and climate-change-related extreme events become more frequent, the role of biodiversity management will help to reduce long term economic and ecological vulnerabilities, ensuring that the unique plant and animal wealth are sustainably managed for the economic development of the State.

Community based approach to forest management, farm forestry and social forestry are some of the approaches to forest protection and management. In Kerala, 19 projects have been sanctioned so far under TDF, involving a financial assistance of Rs.34.11 crore. Of these, three have been completed and 16 are on-going. A cumulative amount of Rs.26.15 crore has been released under various TDF projects as on 31 December 2018.

The potential for credit support assessed for **Forestry & Wasteland for the year 2019-20 is Rs.213 crore.**

f) Animal Husbandry

In Kerala majority of rural households depend on livestock farming for supplementary income. Rearing livestock such as cows, buffaloes, goats, pigs, poultry etc., provides a subsidiary income to the families. Livestock sector in Kerala is one of the fastest growing sectors of the State's rural economy, which accounts for approximately 3 percent of the Gross State Value Added (GSVA) and can have a significant impact on the rural and urban livelihoods. Efforts in animal resource development can contribute to enhance nutrition, generate employment, alleviate poverty, provide food security and empower women.

As per the 19th Livestock census (2012), the livestock population in the State is 27.35 lakh. Amongst the cattle, 12.51 lakh (94 per cent) are cross bred and only 77,000 are indigenous, the indigenous breed recording decline of 35.18 per cent as compared to the previous census. Growth in milk, egg and meat production keep pace with steady rise in demand. Supplies of quality feed and fodder at affordable rates are necessary. Modern facilities in animal slaughter, need for multi-specialty clinics and ambulance service for diagnosis of new and emerging diseases is the need of the hour.

The potential for credit support assessed for **Animal Husbandry for 2019-20 is Rs.4,645 crore.**

g) Fisheries Development

Kerala is rich in marine, brackish water and fresh water fish resources. These water bodies are inhabited by a wide variety of aquatic fauna and flora. Kerala has a coastline of 590 km, a continental shelf area of 39,000 sq.km, an exclusive economic zone of 2.19 lakh sq.km, and an inland water spread of around 4 lakh ha. There are 222 marine fishing villages and 113 inland fishing villages in the State. The total fish production in Kerala during 2016-17 was 6.76 lakh tones, of which marine fish landing accounted for 4.88 lakh tonnes and inland fish production was 1.88 lakh tonnes.

Fisheries and aquaculture contributes around 8.5 percent of the Gross State Value Added (GSVA) from the primary sector which is of significance to the State Economy. The share of fisheries sector in the GSVA has declined from 1.12 percent to 0.95 percent in 2016-17. Kerala has made vital contributions in the export of marine products from the country. During 2015-16, export of marine products from Kerala was 159,141 tones valued at Rs.5,009 crore.

The potential for credit support assessed for **Fisheries Sector for 2019-20 is Rs.614 crore.**

Agriculture Infrastructure

h) Storage Godown & Market Yard

Agriculture infrastructure is the most essential input which contributes to agricultural growth rate. Govt aims to achieve food security through support price for procurement of food grains, better price realization to farmers, scientific storage facilities, maintenance of buffer stock and availability of grains to public at reasonable prices under Food grains Management System. The total storage capacity available with FCI is 360.68 lakh MT as on

30.11.2017. Storage capacities, both Covered and CAP, available with State Agencies for Central Pool stock of food grains is 365.68 lakh MT. As a result, total of 726.18 lakh MT of storage capacity was available for storage of Central Pool stock of food grains.

India has a total agri warehousing capacity of around 91 MMT at present to store and conserve such large quantities with State agencies owning to 41% of the capacity and the balance distributed among private entrepreneurs, cooperative societies, farmers etc. Though the storage capacity has increased at a CAGR of 6.7% during the last decade till March 2010, the irony remains that around 20-30% of total good grain harvest is wasted due to lack of availability of storage capacity, regional imbalance in warehouses, storage and in-efficient logistic management in the Country. At present a storage gap of approx. 4 lakh MT for warehouses and 1 lakh MT for cold storage has been estimated. Considering the fact that many of the existing storages do not form to scientific storage norms, the gap is estimated about 10 lakh MT.

The potential for credit support assessed for **Construction of Storage facilities for 2019-20 is Rs.385 crore.**

i) Land Development

Out of the total geographical area of 38.86 lakh ha of the State, roughly 14.76 lakh ha is prone to soil erosion hazards. It is estimated that around 3.82 lakh ha area has been so far treated with soil and water conservation measures and about 5.25 lakh ha of land is classified as low-lying areas. The activities identified for land development are land reclamation, soil & water conservation measures, command area development, land levelling, terracing, contour bunding, farm bunding, farm ponds etc.

The participatory approach, base level planning and ridge to valley treatment technique successfully adopted in NABARD Holistic Watershed Development Programme (NHWDP) watershed projects implemented under Prime Minister's special programme for distressed districts may be critically evaluated and positive features may be incorporated in watershed programmes being undertaken in the state.

The potential for credit support assessed for **Land Levelling, Soil Conservation and Watershed Development** for 2019-20 is estimated at **Rs.2,105 crore.**

j) Food and Agro Processing

Kerala is a richly endowed agricultural state and is somewhat unique and distinct from many other states in India in terms of land utilization pattern and the cropping pattern. Kerala economy is undergoing structural transformation from mid-seventies by switching over a large proportion of its traditional crop area to more remunerative crops like horticultural crops, coconut and rubber. Kerala is a major producer of Spices, Marine Products, Cashew, Coconuts, Cocoa, Coffee and Tea, Fruits like banana and pineapple etc. It provides fertile bed for food processing industries to grow and flourish, with such a strong base food processing sector has established a linkage between agriculture and industry. It emerged as an important segment of our economy in terms of its contribution to State Domestic Product, employment and investment.

The developed world's food basket consists of 80 per cent of processed food, while the share is only 1.3 per cent in India, thus food processing industry has huge potential for sustainable and more inclusive growth, diversification, possibility of generating substantial employment and further advancement in respect of industrial development in urban and rural areas. The State has 13 agro-climatic zones favouring cultivation of a multitude of crops, vegetables and fruits round the year. Realizing the potential State Govt has initiated various measures through KSIDC and KINFRA through setting up of Food processing parks, Special Economic Zones, Food Zones, KSIDC Mega Food Park etc.

The potential for credit support assessed for **Food and Agro Processing** for 2019-20 is estimated at **Rs.3857 crore**.

k) Micro, small and medium enterprises

The MSME sector is credited with generating the highest rate of employment growth and also accounts for a major share of industrial production in the State. There is a relatively large presence of micro and small industries in Kerala, especially in rural Kerala. In 2010-11, the rural Kerala accounted for 8.6 percent of all non-agricultural establishments in the rural areas of the country. The industries coming under this sector include, handicrafts, handloom, khadi, food processing, garment making, textile, coir, wood, bamboo, rubber etc. The State with its excellent connectivity, communication network and availability of human resources is best suited for the growth of the micro, small and medium scale enterprises.

In Kerala, MSME sector is fast emerging into a major income generating and employment providing sector for various social groups. As per the MSME survey & Quick Results of the 4th census, Kerala has 5.62% of the total MSME enterprises in India.

The potential for credit support assessed under **MSME** for 2019-20 is estimated at **Rs.41,090 crore**.

l) Export credit

India exports approximately 7500 commodities to about 190 countries, and imports around 6000 commodities from 140 countries. As per the statistics there is a positive growth of 4.71 in the value of exports during 2016-17. The value of exports was 1,841,314.39 crore as compared to 1,716,377.99 crore during 2015-16.

Kerala plays an important role in the export prospects of the nation by contributing to spices and marine products exports. The external trade in Kerala is mainly operated through Cochin Port. Major items of trade are cashew, coir and coir products, tea, coffee, pepper cardamom, ginger, other spices and spices oil and marine products etc. Export of tea& cashew kernels through Cochin Port continued to decrease during 2016-17 as recorded in preceding years.

After a long period, the export of coir products showed a substantial increase of 69.89 per cent from 2015-16 to 2016-17 registering 211177 MT of exports. Export of sea foods and coffee increased by 16.43 per cent and 2.11 per cent

respectively during this period. Marine products exports from Kerala also, increased both in quantity and value, in 2016-17 to 193.54 per cent and 150.16 per cent respectively between 2010-11 to 2016-17. Export from the State, which touched 47.59 lakh MT in 2016-17 from 43.11 lakh MT in 2011-12, increased by 10.39 per cent over a period of six years.

The potential for credit support assessed under **Export** for 2019-20 is estimated at **Rs.1,215 crore**.

m) Education

Kerala is known for its investment in its people. The prime focus on the welfare of its citizens has been the hallmark of Kerala's development story. Kerala's achievements in human development are the basis of its national and international fame. Continuing its commitment towards people, Education is one of the four Missions of the Government of Kerala. The bedrock of Kerala's development achievements has been school education, because it was instrumental in making progress in other fields possible. Kerala has already achieved universal elementary education and has a system to meet the educational requirement of all children upto 18 years. The school drop-out rate in Kerala is the lowest in the country.

The potential for credit support assessed under **Education Sector** for 2019-20 is estimated at **Rs.5,703 crore**.

n) Housing

Secure shelter is a basic human need and adequate housing is a human right. Every individual has the right to a safe, secure and decent housing. As per census 2011, the total number of houses in the State is 112.18 crore of which 58.57 lakh are in rural areas and 53.60 lakh are in urban areas. The overall housing availability is better with 336 houses for every 1000 persons in Kerala (all India 273 houses per 1000 persons). Kerala is ahead of other Indian states both in terms of reducing housing deprivation and better quality of housing.

As per the State Planning Board Survey 2016, around 135,769 new housing units were constructed for the houseless and 10.186 households were provided with land during 2010-2015. Expert group assumed that the housing shortage would around 3.5 lakh units as on 31.March 2015. Various State/ Central Schemes are available, Pradhan Mantri Awas Yojana (PMAY) is a recent Central Government programme launched with the objective of achieving the goal of "Housing for All by 2022" and it includes two components PMAY (Rural) and PMAY (Urban). With an aim of eradicating houselessness in the next five years, the State Government has started the Total Housing Mission or Project LIFE (Livelihood Inclusion and Financial Empowerment), which aims a total of around two lakh dwelling units, which is expected to directly benefit about 4.32 lakh families.

The potential for credit support assessed under **Housing Sector** for 2019-20 is estimated at **Rs.22,661 crore**.

o) Renewable Energy Sources

Energy plays a vital role in the socio-economic development and human welfare of a State. An efficient, reliable and sustainable energy supply is a

prerequisite for accelerating economic growth and human development. Planning for the power sector in the current situation in India has become a more complex task than before; new demands have been placed on the sector in terms of climate change mitigation by reducing green gas emission and the promotional of renewable energy.

As per the 19th Electric Power Survey conducted by Central Electrical Authority, the projected energy consumption for the next 10 years for Kerala is 25, 480 mu in 2017-18, 29,924 mu in 2020-21, therefore, Kerala's energy is estimated by this survey to increase by approximately 52 percent above current consumption. Total installed capacity of power in the State as on March 2017 is 2961 mu. In order to overcome the future demand in the power sector, State Government has come out with a draft Kerala Power Policy 2019, and a new scheme called Solar Roof Top Project, which encompasses of three Models. Under Model 1 & 2, the Kerala State Electricity Board will install and operate the Panels and under Model 2, the consumer has to pay for the Panel.

The potential for credit support assessed under **Renewable Energy** for 2019-20 is estimated at **Rs.263 crore**.

p) Micro Credit Innovations

Kerala has been one of the forerunners in the SHG-Bank Linkage movement in the country with the advent of Kerala State Poverty Eradication Mission (Kudumbashree) the movement has got further momentum as on 30.09.2018, 2,89,714 SHGs are credit linked with the Banking system with an outstanding savings of Rs.1737.71 crore. The banks in Kerala has provided financial assistance to 140,577 SHGs totalling to Rs.3471.00 crore (outstanding as on 30.09.2018). With a view to improving access to credit by the SHGs and to help the bankers in making well informed credit decisions, NABARD has embarked on a programmed of digitisation of SHG data viz., **e-Shakti**. E-Shakti is envisaged to infuse vibrancy in the SHGs by digitising their data and updating the same on real time basis every month with an inbuilt concurrent grading mechanism and making it available to stakeholders primarily the banks for ensuring credit linkage of SHGs. So far, five districts of the State have been covered under the scheme. Further, extension of the projects to four more districts viz., Thrissur, Palakkad, Wayanad and Alappuzha are being considered.

q) Social Infrastructure

Creation of social infrastructure was mainly in the domain of public investments. But, growing population and the increasing demand for better educational infrastructure, health care and drinking water facilities led to private investments in these sectors which led to establishment of a host of private institutions. The available infrastructure in the State, especially private infrastructure is heavily concentrated in few places and the facilities are still not accessible in remote areas. To support the sector, the RBI has recently included bank credit for social infrastructure as part of Priority Sector.

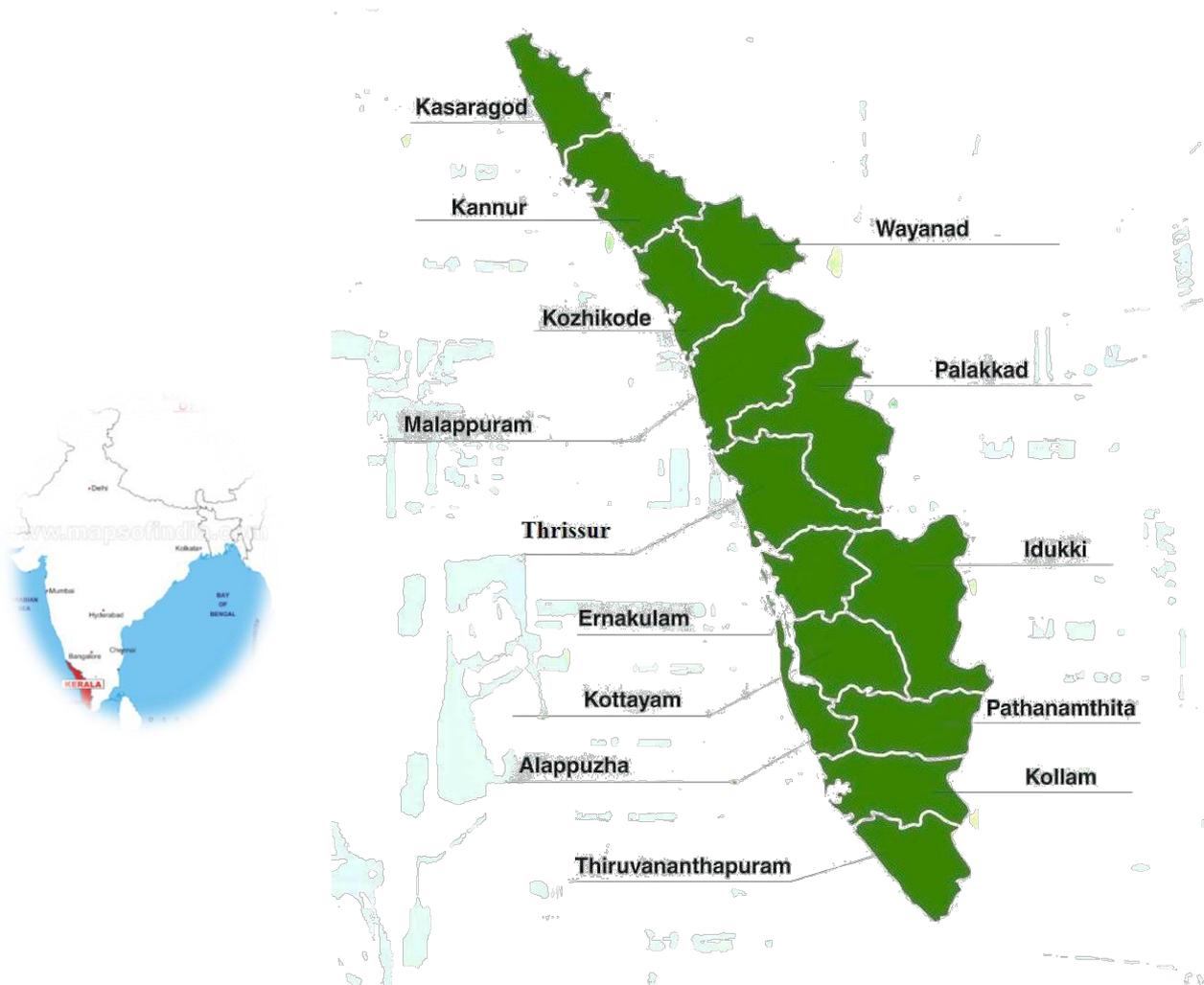
Accordingly, the potential for credit support assessed under **Social infrastructure** involving bank credit for 2019-20 is estimated at **Rs.376 crore**.

r) Building Critical Infrastructure Gaps

The Governments, both at Centre and State, cater to the investment needs through their planned expenditure. However, there remains some critical gaps that could not be filled up, wherein the large investments have already been made but are not yet completed. Relatively small investments can result in completion of these projects and unleash the benefits, which would augment the livelihood of the farmers. There are also projects of critical nature which could not figure in the State plan for various reasons. An attempt has been made to capture a list of such critical infrastructure gaps and is presented as Annexure III.

State at a Glance

- Area: 38863 sq.km
- Population: 33 million – 13th largest State in population
- **05 Agro Climatic Zones** and 6 different soil types
- **85% of the gross cropped area is under plantation crops**
- **1st in Human Development Index** with a score of 0.784
- **4th largest coastline** with a length of 580 km
- **1st State in the country to have four International Airports**
- **Largest producer of Banana in the Country**
- **2nd largest producer of Coffee, Pineapple, Sweet Potato, Tapioca and Cocoa**
- **4th largest cultivator of Passion Fruit**



India's Leading Producer

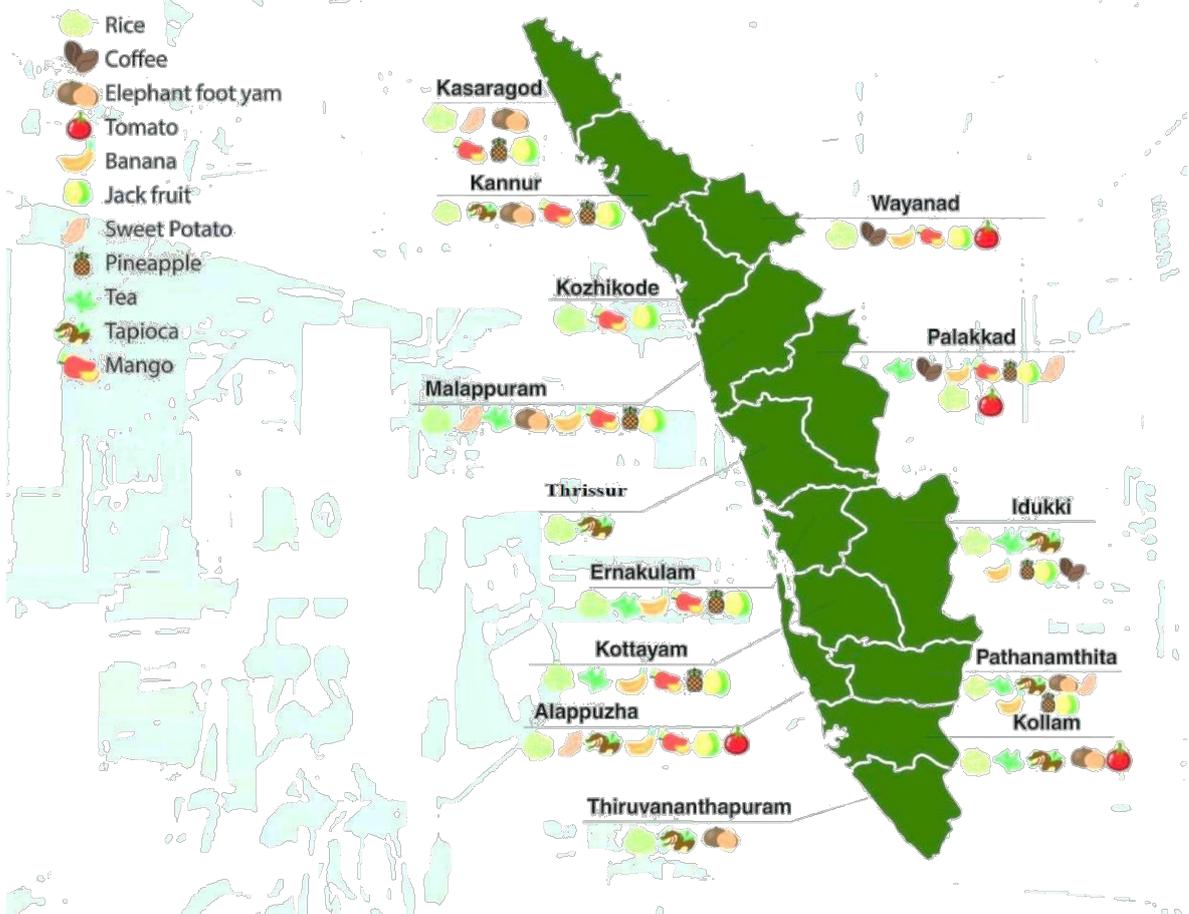


- *Plantation Crops*
- *Coconut*
- *Banana*



- *Arecanut*
- *Cocoa*
- *Tapioca*
- *Pine apple*
- *Sweet Potato*

Production Clusters



State Profile

State - KERALA

1. PHYSICAL & ADMINISTRATIVE FEATURES

Total Geographical Area (ha)	3886287
No. of Districts	14
No. of Blocks	152
No. of Villages	1535
No. of Panchayats	941

3. LAND UTILISATION [ha]

Total Area Reported	3886
Forest Land	1082
Land put to non Agricultural uses	419
Barren and uncultivable land	11.78
Permanent Pastures and Grazing land	5
Land under Misc tree crops	2.45
Cultivable waste	101.30
Fallow other than current fallow	55.53
Current fallow	72.00
Net area sown	2015
Total or Gross cropped area	2584
Cropping Intensity [GCA/NSA]	128

6. WORKERS PROFILE [in lakh]

Cultivators	7.4
Agricultural Labourers	16.5
Other workers	75.3
Workers engaged in Household Industries	3.6

8. HOUSEHOLDS [in No.]

Total Households	11,217,853
Rural Households	5,857,785
BPL Households	3,229,823

10. VILLAGE-LEVEL INFRASTRUCTURE [Nos]

Villages Electrified	1535
Villages having Post Offices	1512
Villages having Banking Facilities	1535
Villages having Primary Schools	1535
Villages having Primary Health Centres	852
Villages connected with Paved Approach Roads	1535

13. IRRIGATION COVERAGE [Ha] 2013-14

Total Area Available for Irrigation (NIA + Fallow)	377833
Net Irrigated Area (Total area irrigated at least once)	377761
Area irrigated by Canals / Channels	64335
Area irrigated by Wells	122478
Area irrigated by tanks	49657
Area irrigated by Other Sources	141291
Irrigation Potential Utilized (Gross Irrigated Area)	457573

15. AGRO-PROCESSING UNITS

Type of Processing Activity	No of units
Food (Rice/Flour/Dal/Oil/Tea/Coffee)	40
Fruit (Pulp/Juice/Fruit drink)	6
Spices (Masala Powders/Pastes)	12
Dry-fruit (Cashew/Almond/Raisins)	325
Cotton (Ginning/Spinning/Weaving)	82
Milk (Chilling/Cooling/Processing)	40
Meat (Chicken/Mutton/Pork/Dry fish)	237
Animal feed (Cattle/Poultry/Fishmeal)	5

17. ANIMAL POPULATION AS PER CENSUS 2012 [in '000]

Category of animal	Total	Male	Female
Cattle - Cross bred	2682.49	356.08	2326.41
Cattle - Indigenous	77.05	12.48	64.57
Buffaloes	102.27	71.18	31.09
Sheep - Cross bred	0.45	0.22	0.23
Sheep - Indigenous	1.00	0.67	0.33
Goat	1246.08	295.32	950.76
Pig - Cross bred	50.82	21.66	29.16
Pig - Indigenous	4.96	2.40	2.56
Horse/Donkey/Camel	0.73	0.44	0.29
Poultry - Cross bred	24281.93	24281.93	
Poultry - Indigenous			

2. SOIL & CLIMATE

Agro-climatic Zone	Western Plains and Ghat Region, Coastal Midland Region Zone 12
Climate	Dry, sub-humid and per humid
Soil Type	Laterite, red loamy, coastal alluvium

4. RAINFALL & GROUND WATER

Rainfall [in mm]	Actual	2014-15	2015-16	2016-17
	Normal	3046.6	1352.3	2652.0
Availability of Ground Water [MCM] (March 2013)	Net annual recharge	3097.0	2039.7	2900.3
	Net annual draft	6251.31	2635	3616.31

5. DISTRIBUTION OF LAND HOLDING (2010-11)

Classification of Holding	Holding (in '000)		Area (in '000 ha)	
	Nos.	% to Total	ha.	% to Total
<= 1 ha	6580	96.3	886	58.6
>1 to <=2 ha	180	2.6	282	18.7
>2 ha to <=4 ha	57	0.8	159	10.5
>4 to <= 10	12	0.2	64	4.2
10 and above	2	0.0	120	7.9
Total	6831	100	1511	100

7. DEMOGRAPHIC PROFILE [in lakh]

	Population	SC	ST	Literacy (%)	BPL
Total	334	3.04	0.49	95	

09. INFRASTRUCTURE RELATING TO HEALTH & SANITATION [Nos]

Anganwadis	33115	Dispensaries	23
Primary Health Centres	852	Hospitals	148
Primary Health Sub-Centres	5403	Hospital Beds	52128

11. INFRASTRUCTURE & SUPPORT SERVICES FOR AGRICULTURE

Total N/P/K Consumption [Ton] (2013-14)	266200	Pumpsets Energised [Nos]	446460
Farmers' Clubs [Nos] (as on March 2018)	2611	Krishi Vigyan Kendras [Nos]	14

12. INFRASTRUCTURE FOR STORAGE, TRANSPORT & MARKETING

Rural/Urban Mandi/Haats [Nos]	475	Wholesale Market [Nos]	214
Length of Pucca Road [Km]	218942	Public Transport Vehicle	817306
Length of Railway Line [Km]	1588	Goods Transport Vehicle	625792

14. AREA, PRODUCTION & YIELD OF MAJOR CROPS

Crop	2015-16		2016-17		Productivity (2015-16)
	Area (000 ha)	Prod. (MT)	Area (000 ha)	Prod. (MT)	
Coconut	790.22	5873	781.49	5384	
Arecanut (pdn in Million)	99.13	132453	97.69	116839	1196
Banana	59.83	536155	57.15	489322	8562
Paddy	196.87	549275	171.40	436483	2547
Pepper	85.95	42132	85.21	34065	400
Pulses	3.76	4263	1.74	1711	984
Rubber	550.84	438630	551.05	540400	981
<i>Production of coconut in million nut, productivity in numbers</i>					

16. INFRASTRUCTURE FOR DEVELOPMENT OF ALLIED ACTIVITIES

Veterinary Hospitals/Dispensaries [Nos]	1110	Animal Markets [Nos]	33
Disease Diagnostic Centres [Nos]	26	Milk Collection Centres [Nos]	3267
Artificial Insemination Centers [Nos]	2515	Fishermen Societies [Nos]	749
Animal Breeding Farms [Nos]	5	Fish seed farms [Nos]	86
Animal Husbandry Tng Centres [Nos]	14	Fish Markets [Nos]	1932
Dairy Cooperative Societies [Nos]	3683	Poultry hatcheries [Nos]	32
Improved Fodder Farms [Nos]	2	Slaughter houses [Nos]	31

18. MILK, FISH, EGG PRODUCTION & THEIR PER CAPITA AVAILABILITY

Fish	Production [Lakh Tonnes]	6.80	Per cap avail. [gm/day]	558
Egg	Production [Lakh Nos]	23481	Per cap avail. [nos/p.a.]	77
Milk	Production [000 MT]	2576	Per cap avail. [gm/day]	431
Meat	Production (poultry+other meat)	469	Per cap avail. [gm/day] (12-	70.00

Sources (if not mentioned against the respective item):

Item Nos. 6, 7 & 10 - Census 2011; Item Nos. 1, 2, 3, 5, 11, 12, 13 & 16 - Economic Review 2017, Farm Guide 2018; Item No. 14, 16, 17 & 18 - Dept. of Agr./Water Resources; Item No. 8 - NREGA Report; Item No. 14 - District Ind Centre/Dir. of Eco. & Stat.; Item No. 15 - DACNET; Item No. 16 - AH Census 2012; Item Nos. 17 & 18 - Eco Review 2017

1.1 Introduction

Kerala State situated in the Southern tip of India, covers an area of 38.863 sq.km. The State lies within East longitudes 74° 52' and 77° 22' and North latitudes 8° 18' and 12° 48', and is bordered by the State of Karnataka to the North and North-East, Tamil Nadu to the East and South, and the Lakshadweep sea to the West.

As per 2011 census of India, Kerala ranks 13th among states in population with 334.06 lakh inhabitants. The state has a lot to offer to the rest of the country in terms of exceptional human capital formation, high environmental standards, remarkable tourist sites, good decentralised governance and so on.

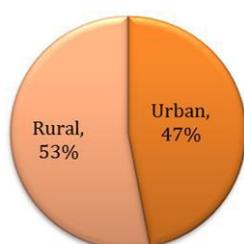
The State has a coastline of 580 km, **the 4th largest among all the States** after Gujarat (1915 km), Andhra Pradesh (1037 km) and Tamil Nadu (867km).

1.2 Geography

Geographically Kerala roughly divides itself into three climatically distinct regions, these includes the eastern highlands (accounts for 48% of the total land area), the Central Midland (accounts for 40% of the total land area) and the Western Coastal Plains, (covers an area of about 4000 sq.km). The analysis of agro ecology of Kerala is primarily based on climate, geo-morphology, land use and soil variability, results into its delineation of 5 agro ecological zones and 23 widely varying agro ecological units with significant yield gaps.

Profile of Kerala at glance	
Total area	38863 sq.km
Districts	14
Taluks	75
Block	152
Grama panchayats	941
Villages	1535
Municipalities	86
Corporations	06
<i>(source: Farm Guide 2018)</i>	

Rural/ Urban Division



1.3 Demographic Profile

As per 2011 census of India, the State had a population of 334 lakh with a population density of 859/sq.km. More than 53% of the total population of the State is residing in rural areas. The population of Kerala forms 2.76% of India's population in 2011. Children in the age group of 0-6 years constitute 10.40% of the total population compared to 12% during 2001. Malappuram is the most populated district and Wayanad is the least populated district in Kerala.

In addition, Kerala is the home to 3.21 lakh indigenous Tribal *Adivasis* (1.10% of the populace). Some 63% of tribal reside in the eastern districts of Wayanad (35.82%), Palakkad (1.02%) and Idukki (15.66%).

Total population of the State includes 9.09% of Scheduled Castes and 1.45% of Scheduled Tribes.

Kerala has the highest literacy rate among Indian states, with an effective rate of 93.91 percent. Kerala **ranks 1st in Human Development Index** with a score of 0.784, among other States in the country.

The sex ratio of Kerala is 1084 and has improved by 26 points from 2001, which is much higher than the national average of 940 as per 2011 census.

1.4 Economy

The estimate of Gross State Domestic Product (GSDP) at constant (2011-12) prices is Rs.4,80,878 crore during 2016-17 registering a growth rate of 7.41% in 2016-17 compared to 6.60% in 2015-16. The Net State Domestic Product (NSDP) at factor cost (at constant prices 2011-12) is Rs.4,40,513 crore in 2016-17 compared to the provisional estimate of Rs.4,09,070 crore during 2015-16, recording a growth of 7.69 percent in 2016-17. Kerala's per capita GSDP at constant prices in 2016-17 was Rs.1,40,107 as against the provisional estimate of Rs.1,31,056 in 2015-16, recording a growth rate of 6.88 percent in 2016-17.

During 2016-17, the contribution from primary, secondary and tertiary sectors to the Gross State Value Added (GSVA) at constant prices was 11.27 percent, 25.59 percent and 63.14 percent respectively. The contribution to GSVA (current prices) of the tertiary sector and primary sector increased from 62.9 percent in 2015-16 to 63.18 percent in 2016-17, and from 12.82 percent in 2015-16 to 13.36 percent in 2016-17 respectively.

The analysis of annual sector-wise growth rate of GSDP shows that tertiary sector recorded the highest growth rate of 6.7 percent in 2016-17 at constant prices followed by primary sector 5.19 percent and tertiary sector at 2.88 percent. During the period, the growth rate in primary sector increased from (-) 11.2 percent to 5.19 mainly because of the increase of production of some of the crops, livestock, fishing and aquaculture and mining and quarrying.

1.5 Land Use pattern in Kerala

The total cropped area of the State has been declining consistently, from 30 lakh hectare in 2000 to 25.84 lakh hectare in 2016-17. Net sown area has recorded a slight decline of 8.64 percent, and the area sown more than once has declined by 30.29 percent. Current fallows have decreased 7.5 percent whereas the "fallows other than current fallows" as well as "cultivable waste land" have recorded an increase of 63.38 percent and 71 percent respectively. Thus the land that is fit for cultivation but is not being cultivated is on the rise signalling the tendency of people to keep land fallow for various reasons.

Size of holding	No. (in '000)	Area (in '000 ha)
Below 1	658	886
1 to 1.99	180	282
2 to 3.99	57	159
4 to 9.99	12	64
10 above	2	120

(Source: Economic Review 2016)

Category	1975-76	2009-10	2014-15	2015-16	2016-17	% change in area between 2015-16 & 2016-17
Total Geographical Area	3885	3885	3886	3886	3886	0
Forest	1082	1082	1082	1082	1082	0
Land put to non-agricultural use	259	372	419	435	419	2
Barren & uncultivated land	78	22	13	13.1	11.78	-10
Land under Misc. Tree Crops	84	4.4	2.6	2.66	2.45	-8
Cultivable Waste	113	98	101	99.49	101.30	2

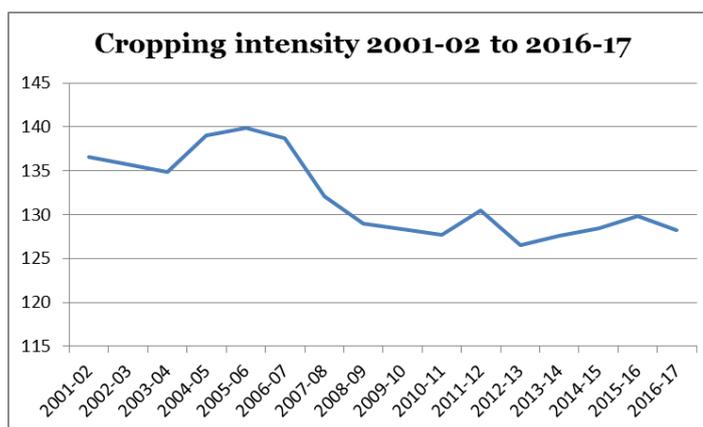
Fallow other than current fallow	23	45	55	55.28	55.53	0.49
Current Fallow	37	77	65	70.00	72.00	3
Net Sown Area	2189	2078	2043	2023	2015	-0.38
Total Cropped Area	2981	2669	2625	2627	2584	-2
Area sown more than once	792	590	582	604	568	-6
Cropping Intensity	136.2	128	128	160	128	

(Source: ER 2017, Kerala Planning Board)

The land utilisation of Kerala shows that in 2016-17, out of the 38.86 lakh ha. of geographical area, total cropped area was 25.84 lakh ha. (66%). Year on year, there has been a 2 percent decline in the gross cropped area. This is basically due to *decline in area sown more than once, diversion of economic activity from agricultural operations to non-agricultural operations due to high input prices and labour cost*, shift in cropping pattern skewed towards cash crops, division of agricultural land to non-agricultural uses, etc.

1.6 Agriculture

Kerala agricultural economy is undergoing structural transformation in the trend of decreasing cultivated area of crops like paddy, tapioca and increasing cultivated area of banana and plantain. The area under paddy has been declining continuously over the past several years. The gross cropped area of food crops increased to 36% of total cropped area whereas 57% are covered with oil seeds and plantation crops and non-food crops. Cropping pattern in the State is dominated by cash crops like rubber, cashew, pepper, tea and coffee, covering 62.8% of the total cultivated area. Coconut occupied largest area of crop cover followed by Rubber and Paddy.



As per 2011 census percentage of agricultural workers in Kerala is 5.96% and it was 7.36% as per 2001 census.

According to the data, the year-on-year growth rate of agriculture and allied activities were (-)3.1 percent in 2012-13, (-)3.8 percent in 2013-14, 0.75 percent in 2014-15 and (-) 7 percent in 2015-16. Thereafter, the sector witnessed growth of 2.5 percent in 2016-17.

Share of Agriculture and allied sectors in GDP at National and State level (Base 2011-12)

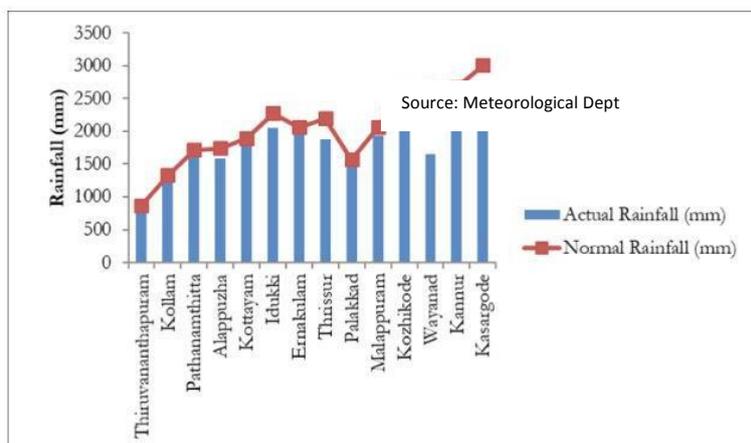
Sl. No.	Year	Share of agriculture and allied sectors in GDP (India)	Share of Agriculture and allied sectors in GSDP (Kerala) #
1	2012-13	17.8	13.76
2	2013-14	17.7	12.36
3	2014-15	16.5	11.91
4	2015-16	15.4	10.85 (provisional)
5	2016-17	NA	10.58 (Quick)

(Source: Economic Review 2017)

1.7 Rainfall

Agriculture in Kerala is mostly dependent on rainfall. The actual rainfall received in Kerala during Southwest monsoon (June to Sept 2017) was 1855.9 mm as against the normal rainfall of 2039.7 mm in 2017 showing (-9) percent departure from normal. Rainfall from October to November, the actual rainfall received in Kerala was 2363 mm against the normal rainfall of 3019 mm (22% lower than normal). The pre-monsoon rainfall received from March to May 2017 was normal with a departure of (-7) percent from normal. The actual rainfall received during the period was 354.3 mm against normal rainfall of 379.9 mm. The rainfall received during Northeast Monsoon (Oct to Dec 2017) was normal with a departure of (-8) percent from normal. The actual rainfall during the period was 441.8 mm against the normal rainfall of 480.7 mm.

Southwest Monsoon Rainfall Received from June 1 to September 30, 2017



1.8 Plantation Crops

Kerala has significant role in plantation sector of the country. Kerala has a substantial share in the four plantation crops of rubber, tea, coffee and cardamom. These four crops together occupy 7.04 lakh ha, accounting for 27.29 per cent of gross cropped area in the State. While there was a reduction in the total rubber output at all India level during 2015-16 to 2016-17, production of rubber in Kerala increased from 4.38 lakh MT in 2015-16 to 5.4 lakh MT in 2016-17.

Regarding Coffee, our production has slightly declined from 69,230MT in 2015-16 to 63,476 MT in 2016-17. Among the States, Kerala stands 2nd next to Karnataka which accounts for 70.4 percent of total Indian Coffee production.

Kerala accounts for 5.03 per cent of the area and 6.3 per cent of the total domestic production of tea in the country. In 2016-17, tea production increased by 3607 tonnes despite area remaining the same on account of increase in productivity.

India is the second largest producer of small cardamom and plays an important role in international trade of cardamom. In Kerala cardamom production has declined to 17147 tonnes in 2016-17 from 19500 tonnes in 2015-16.

1.9 Livestock sector

Livestock sector is an important sub-sector of the agricultural sector of the economy. It provides self-employment opportunity to unemployed in rural areas. The progress in livestock will directly reflect a more balanced development in rural economy up-liftment of weaker section of the society. In Kerala, the share of livestock in GSVA from agriculture sector is nearly 29 percent. However, it has shown a marginal fall from 29.35 percent in 2015-16 to 29.14 percent in 2016-17.

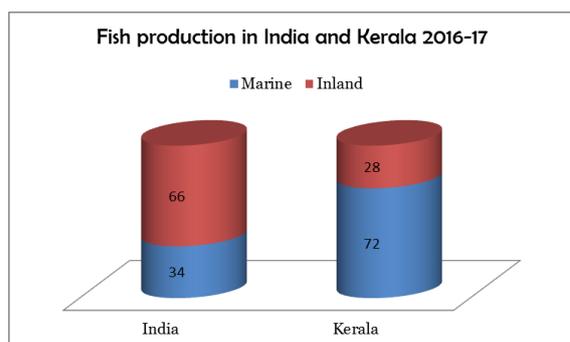
As per the 19th Livestock census (2012), the livestock population in the State is 27.35 lakh. It is 23 percent less as compared to previous census. The primary reason for this is

the decline in the population of cattle and goats. The poultry population of Kerala is 242.82 lakh, which accounts for 3.3 percent of the total poultry population in the country, registered 54 per cent increase over the 18th census. Kerala ranks 8th among States in poultry population in the country.

Among the milk producing States in the country, Kerala ranks 14th, with a share of 1.5 percent of the production. The production of milk declined from 26.49 lakh MT to 25.20 lakh MT in 2016-17, and the per capita availability of milk in Kerala has been declining during the 12th Plan period.

The total egg production in the State was at 2.23 billion eggs in the year 2012-13 and continued to rise and reached 2.50 billion in the year 2014-15. Since, then it declined to 2.44 billion in 2015-16 and further to 2.34 billion in 2016-17. Kerala ranks 9th among the States of India in egg production.

The meat production in Kerala, which was around 2 lakh MT in the beginning of 11th plan increased to 4.26 lakh MT in 2011-12, but since then it has hovered around 4 lakh MT. During 2016-17, there was a marginal increase to 4.69 lakh MT from 4.66 lakh MT in 2015-16. Kerala is the 7th largest meat producing State in the country contributing 6.3 percent of the meat produced in India.



1.10 Fisheries

Fisheries sector occupies a predominant place in the socio economic development of the State as it contributes to the economic growth and income generation to large number of people in Kerala. The total fish production in Kerala during 2016-17 was 6.67 lakh tonnes, of which marine accounted for 4.88 lakh tonnes and inland fish production was 1.88 lakh tonnes.

Fisheries and aquaculture contributes around 8.5 percent of the GSVA from the primary sector which is of significance to the State economy. Kerala's contributions in the export of marine products from the country during 2015-16 was 1,59,141 tonnes valued at Rs.5,008.54 crore.

1.11 Infrastructure

Roads: Kerala has a total road length of 2,18,942 km as on 31 March 2017 that criss-cross the length and breadth of the State. The snapshot of road categories is given here.

Ports: Kerala has the 4th largest coastline in India, covering a length of over 560 km long narrow strip of land bordering the Arabian Sea at the south western part of the peninsular India. Kerala has one major port and 14 minor ports and 3 intermediate ports. Kochi Port is the major port in Kerala and one of the largest commercial ports in India and the closest to international shipping routes (as well as safest for ships to dock).

Road Category	Length (km)
National Highway	1,781.57
State Highway	4,341.65
District Roads	27,470.46
Rural Roads	81,252.00
Road Density/100 sq.km	554.35
Road length/ lakh population	655.70

Kochi is an important hub of maritime commerce in India with a string of facilities like a container transshipment terminal (the only Indian port with this facility), shipyard for ship manufacturing and maintenance (largest in India), LNG terminal, oil terminal

of Kochi Refineries, marina for yacht-totters (only facility in India). Other proposed major port includes Vizhinjam International Seaport, which is under its final stage. Once commissioned it will serve as one of the largest sea port in India.

Airports: Kerala is the **first State in the country to have four International Airports**, viz., Thiruvananthapuram, Kochi, Kozhikode and Kannur. During the last financial year, Cochin International Airport touched the magic figure of 10 million passengers in single fiscal. The total passenger traffic in the State stood at 1.82 million in 2017-18. The recently opened Kannur International Airport (KIAL) is the largest civil air facility in Kerala.

Railways: The State has a total rail network of 1588 km. The two administrative zones, viz., Thiruvananthapuram and Palakkad carries 2.16 lakh and 2.6 lakh passengers respectively on a daily basis.

Banking Profile

State - KERALA

1. NETWORK & OUTREACH (as on 31/03/2018)

Agency	No. of Banks/Soc.	No. of Branches				No. of non-formal agencies associated			Per Branch Outreach	
		Total	Rural	Semi-urban	Urban	mFIs/mFOs	SHGs/JLGs	BCs/BFs	Villages	Households
Commercial Banks	38	5626	284	3956	1386	Nil			0.26	1993.93
Regional Rural Bank	1	630	51	540	39	Nil			2.30	17806.12
State Co-operative Bank	1	21	0	0	21	Nil	82358	Nil	0.58	4442.71
District Central Coop. Bank	14	804	0	0	804					
Coop. Agr. & Rural Dev. Bank	1	159	117	28	14					
Primary Agr. Coop. Society	1647	1647	1647	0	0					
Small Finance Banks	2	92	23	52	17					
All Agencies	1704	8979	2122	4576	2281		82358		3.14	24243

2. DEPOSITS AND LOANS & ADVANCES OUTSTANDING

Agency	Amount of Deposit [Rs.Crore]					Amount of Loan [Rs.Crore]				
	31 Mar 16	31 Mar 17	31 Mar 18	Growth (%)	Share (%)	31 Mar 16	31 Mar 17	31 Mar 18	Growth (%)	Share (%)
Commercial Banks	345,259	398346	430029	8	83	220489	242334	285373	18	80
Regional Rural Bank	16,334	12146	15372	27	3	11928	13741	16320	19	5
Cooperative Banks	59,734	64134	69718	9	13	36784	42018	47777	14	13
Small Finance Banks	0	0	1834		0	0	0	8490		2
All Agencies	421,327	474,626	516,953	9	100	269201	298093	357960	20	100

4. CD-RATIO

Agency	CD Ratio		
	31 Mar 16	31 Mar 17	31 Mar 18
Commercial Banks	61	66	66
Regional Rural Bank	113	106	106
Cooperative Banks	0	462	69
Small Finance Banks	0	0	3
All Agencies	64	63	69

5. COVERAGE UNDER PM FASAL BIMA YOJANA & RWBCIS

Agency	PMFBY		RWBCIS	
	No. of a/c	Loan Amt (lakh)	No. of a/c	Loan Amt (lakh)
Commercial Banks				
Regional Rural Bank				
Cooperative Banks				
All Agencies				

6. PERFORMANCE TO FULFILL NATIONAL GOALS (as on 31/03/2018)

Agency	Outstanding - Weaker Section		O/s SF, MF & AL		O/s - Artisans, V & C ind		SC Advances o/s		ST adv o/s	
	No. of account	Amount [Rs.lakh]	No. of account	Amount [Rs.lakh]	No. of account	Amount [Rs.lakh]	No. of account	Amount [Rs.lakh]	No. of account	Amount [Rs.lakh]
Commercial Banks	3568782	5653216	3795842	3777097.00	10325	11212.00	302567	505811.00	78020	122369.00
Regional Rural Bank	1411769	1190139	1141845	823997.00	16009	2731.00	32230	18832.00	16099	9412.00
Cooperative Banks	78697	176507	189621	256782.26	18252	8345.21	12145	21106.29	3145	3021.11
Small Finance Banks	1027	1066	803	736.00	0	0	349	99.98	47	7.43
All Agencies	5060275	7020929	5128111	4858612	44586	22288	347291	545849	97311	134810

7. AGENCY-WISE PERFORMANCE UNDER ANNUAL CREDIT PLANS (Rs. in crore)

Agency	2015-16			2016-17			2017-18			Average Ach [%] in last 3 years
	Target	Ach'ment	Ach'ment [%]	Target	Ach'ment	Ach'ment [%]	Target	Ach'ment	Ach'ment [%]	
Commercial Banks	59996.22	62455.25	104	66713.60	62931.40	94	91157.25	134139.20	147	115
Regional Rural Bank	7912.95	8875.80	112	8588.02	12460.40	145	12055.98	13672.84	113	124
Cooperative Banks	36463.69	36218.98	99	41105.92	32102.30	78	69865.28	55511.97	79	86
Others	564.74	572.44	101	540.85	418.35	77	0	0	0	60
All Agencies	104937.60	108122.47	103	93124.06	97690.78	105	173078.51	203324.01	117	108

8. SECTOR-WISE PERFORMANCE UNDER ANNUAL CREDIT PLANS (Rs. in crore)

Broad Sector	2015-16			2016-17			2017-18			Average Ach [%] in last 3 years
	Target	Ach'ment	Ach'ment [%]	Target	Ach'ment	Ach'ment [%]	Target	Ach'ment	Ach'ment [%]	
Crop Loan	34722.43	41854.18	121	39392.52	40409.61	103	42516.5602	48242.795	113	112
Term Loan (Agr)	13178.34	10519.38	80	14873.45	1386.40	9	15566.2785	18846.638	121	70
Total Agri. Credit	47900.77	52373.56	109	54265.97	54270.01	100	58028.8388	67089.433	116	108
Non-Farm Sector	19169.85	19277.38	101	26920.71	21737.31	81	30252.334	31093.069	103	95
Other Priority Sector	37866.98	36471.53	96	35761.71	31905.13	89	38673.6641	40104.588	104	96
Total Priority Sector	104937.60	108122.47	103	116948.39	107912.45	92	126954.84	138287.09	109	101

Source: SLBC

2.1 Introduction

Kerala has good banking network which has been steadily growing to cater to ever growing banking needs of the population. As on 31 March 2018, banking network of the State comprised 43 Commercial Banks (27 Public Sector Commercial Banks and 16 Private Sector Commercial Banks), one RRB (Kerala Gramin Bank (KGB)), Kerala State Cooperative Bank (KSCB) with 14 affiliated District Cooperative Banks (DCBs), 1647 Primary Agriculture Co-operative Societies (PACS) and Kerala State Agriculture and Rural Development Bank (KSCARDB) with 75 Primary Co-operative Agriculture and Rural Development Banks (PCARDBs).

Strong cooperative credit delivery of the State with their historical association with the rural households, have the potential to become most important medium of financial inclusion. Canara Bank is the Convenor of the State Level Bankers’ Committee (SLBC) in the State.

Banking services in the State are provided through a network of 8909 branches (5717 branches of Commercial Banks and 632 branches of RRB and rest in Co-operative sector including PACS) with per branch population of 4285 persons as against all India average of 11,000 persons. Kerala accounts for 5% of the total number of bank offices, 3.53% of the total deposits and 3.15% of the total advances of the country.

2.2 Achievement of National Goals by banks in the State

Banks in the State continued their good performance in achieving the overall goals set by Reserve Bank of India (RBI). The outstanding loans under priority sector to Adjusted Net Bank Credit (ANBC) remained more than 55% during the previous years against the National Goal of 40%.

Marginal improvement is also observed in case of agriculture advances during the last three years at 24% constantly against the target of 18%. Advances to weaker sections as on 31.03.2018 were Rs.68,434 crore, which constituted 24% as against the stipulation of 10% of ANBC.

The share of agri-term loan to total agricultural lending was 25% during 2017-18. Banks need to ensure that the agricultural term credit is dispensed to facilitate capital formation in agriculture.

Performance against Priority Sector Lending Goals

Item	Tgt. (%)	State Performance (%)						
		March 2012	March 2013	March 2014	March 2015	March 2016	March 2017	March 2018
Priority Sector Advances to Total Credit	40	57.34	56.72	59.14	59.68	57.16	56.52	58.74
Agri Advances to Total Credit	18	24.25	25.73	25.42	25.31	19.00	23.08	28.29
CD Ratio	60	75.57	76.41	68.66	68.37	63.89	62.81	75.88

(Source: SLRM 2018)

As may be seen from the above table, banks have surpassed benchmarks set by RBI under priority sector advances during 2017-18. The performance under annual credit plans, details of deposits, loans and advances outstanding etc. are given in the Banking Profile.

2.3 Performance under Agriculture Term loans Low share of Agriculture Term loan

Credit flow to Agriculture Sector during 2017-18 (Rs. crore)

Agency	Crop loan		Term Loan		Total Agri	
	Target	Ach.	Target	Ach.	Target	Ach.
Commercial Banks	23890.57	31712.08	8325.39	11720.61	32215.96	43432.69
Cooperatives	13848.25	8506.49	5884.43	4932.30	19732.68	13438.79
Reg. Rural Banks	4777.74	8024.22	1356.45	2193.72	6134.19	10217.94
Total	42516.56	48242.79	15566.27	18846.63	58082.83	67089.42
% of achiv. (2017-18)		113.47		121.07		115.51
% of achiv. (2016-17)		102.58		93.19		100.01

(Source: SLRM, 2018)

The need for investment in agriculture is increasing due to a rising population and changing dietary preferences of the growing middle class in Kerala towards higher value foods (eg. pulses, dairy, meat, fish, fruits, vegetables, etc). Longer-term agricultural financing is needed for long-term investments for capital formation in various sectors of agriculture. (Most of the current longer-term financing goes to trade and working capital).

Performance of Cooperative Banks

Parameter	June 2018			Share of Coops to total
	Coops Sector	Comm Banks + RRB + SFB	Total	
Branches	984	6365	7349	13%
Total deposits	67452	462741	530193	13%
Total advances	46613	291520	338133	14%
Total business	114064	754261	868325	13%
Priority sector adv	27826	170161	197987	14%
% Priority Sector	60%	58%	59%	-
Agriculture adv	7022	71090	78112	9%
% agriculture adv	15%	24%	23%	-

2.4 Financial Inclusion in Kerala – Status

Government of India, RBI and NABARD launched programmes to promote financial Inclusion. Financial Inclusion Plans (FIPs) were drawn by all the Banks to ensure coverage to all unbanked and under banked villages through brick and mortar branches, Business Correspondents (BCs), Ultra Small Branches and also to ensure availability of all banking services such as Saving Banks accounts, Overdraft facilities, agriculture credit through KCC, entrepreneurial credit facilities through GCC, micro insurance, fund transfer, remittance, pension, etc. through ATMs, micro ATMs, kiosk banking and BCs.



With persistent efforts by the Bankers and the State Govt, all the unbanked villages in Kerala have been brought under the purview of banking operations. Hence, the focus is now to ensure smooth and easy access to credit and other facilities for the farmers and other needy sections of the rural population.

Financial Deepening

Financial inclusion, financial literacy and consumer protection are the three major pillars of financial stability. Financial inclusion acts from the supply side covering issues like financial markets, network of banks and other financial institutions, appropriate design of products and services, etc.

Inclusion becomes meaningful only when the usage of the system reaches a higher level. Usage could increase with the availability of appropriate products and services to the users and the awareness about the products. Financial Literacy Centres (FLCs) are expected to create awareness and enable the consumers to take informed decisions. With the persistent efforts of RBI, NABARD & SLBC, Financial Literacy Centres (FLCs) were established in all the 152 blocks of the State. All 14 DCBs and Kerala Gramin Bank have been supported with 24 FLCs and 07 FLCs respectively. As on 01 January 2019, a cumulative amount of Rs.202.07 lakh has been sanctioned and Rs.136.86 lakh has been disbursed towards grant support to FLCs, by NABARD out of Financial Inclusion Fund.

The FLCs / FLCCs / Livelihood and Credit Counselling Centres established and maintained by the banks serve as a beacon towards creating financial literacy awareness among the people by way of conducting camps / campaigns in the villages / blocks, door-to-door canvassing, debt restructuring, family budgeting, livelihood income generation counselling, etc.

Pradhan Mantri Jan Dhan Yojana (PMJDY)

Pradhan Mantri Jan Dhan Yojana is a scheme for comprehensive financial inclusion launched by Hon'ble the Prime Minister of India, Shri. Narendra Modi on 28 August 2014. PMJDY focuses on coverage of households as against the earlier plan which focused on coverage of villages. With a bank account, every household would gain access to banking and credit facilities. This will enable them to come out of the grip of money lenders, manage to keep away from financial crisis caused by emergent needs, and most importantly, benefit from a range of financial products. As 09 January 2019, more than 33.82 crore accounts have been opened all over India under PMJDY. Guinness World Records recognizes the Achievements made under PMJDY. Guinness World Records Certificate says "*The most bank accounts opened in 1 week as a part of financial inclusion campaign is 18,096,130 and was achieved by Banks in India from 23 to 29 August 2014*".

Second phase of PMJDY

As per PMJDY mission document, second phase of PMJDY will include the overdraft facility, Creation of Credit Guarantee Fund for overdraft accounts, micro-insurance, pension, coverage of households in hilly, difficult and tribal areas. The focus here would be covering the remaining adults and students. The 03 social security schemes, viz., Pradhan Mantri Jeevan Jyoti Bhima Yojana (PMJJBY), Pradhan Mantri Suraksha Bhima Yojana (PMSBY) and Atal Pension Yojana (APY) were launched on 9th May 2015. *Kottayam DCB was given a National award as the Best DCCB for opening maximum number of accounts under Atal Pension Yojana.*

Financial Literacy Programmes

It has been decided that need based support will be provided to the banks on financial literacy as assessed by them in tune with their approved Financial Inclusion Plans. The support will be provided for financial literacy programmes conducted by bank branches/FLCs beginning from 01 April 2018. Banks have to ensure that at least two programmes per FLC per month are conducted for different target groups. As on 11 Jan 2019, Rs.59.00 lakh has been sanctioned to various Commercial Banks (for State specific projects), Kerala Gramin bank and DCBs for conduct of 1291 camps has been sanctioned.

Demonstration of Banking Technology through Mobile Van

In order to promote digital financial literacy, the demonstration of banking technology through mobile van has been supported under Financial Inclusion Fund (FIF). The scheme aims at spreading Financial Literacy, demonstration of various digital banking technologies, to sensitize and enable merchants and end customers to use digital payment system, create awareness among the users about the measures while using different banking technologies, demonstration of micro ATM, ATM, POS, RuPay card transaction etc.



to precautions and safety demonstration of micro ATM, ATM, POS, RuPay card transaction etc.

During 2017-18, an amount of Rs.90.00 lakh has been sanctioned for 6 mobile vans to Kerala Gramin Bank, Kannur DCB, Ernakulam DCB, Malappuram DCB and Idukki DCB. An amount of Rs.11.39 lakh has been released so far during 2018-19 under the scheme.

2.5 Core Banking Solutions (CBS) – A NABARD initiative

In Kerala, of the 14 DCBs and Kerala StCB, 9 banks opted for NABARD facilitated project for CBS and all these banks have migrated to the CBS platform. Cooperative banks in the State have started offering RuPay debit cards, SMS alerts, ATM facilities, RTGS / NEFT, CTS and DBT facilities to their customers. In addition to providing the above mentioned banking services including KCC facilities to the members of PACS through different models.

2.6 Coverage of live KCCs of Cooperative Banks with RuPay Kisan Cards

Hon'ble Prime Minister has indicated that 3 crore Kisan Credit Cards are to be converted into RuPay Cards. An estimated number of around 3 crore Kisan Credit Cards are with cooperative sector (Rural Cooperative Banks and their affiliated Primary Agricultural Credit Societies), hence, it is important to support cooperative sector for conversion of Kisan Credit Cards into RuPay Cards. The support is available up to 80% of the cost of the RuPay Kisan Card or Rs.25 per card, whichever is lower. It is estimated that around 8 lakh KCC accounts are with Kerala Gramin Bank and DCBs as on 30 September 2018. A total of 3.41 lakh Rupay Kisan Credit Cards have been issued by KGB and DCBs as on 30 September 2018.

2.7 Operationalisation of Central KYC Records Registry

Government of India vide notification dated July 7, 2015, amended the Prevention of Money Laundering (Maintenance of Records) Rules, 2005, (Rules), for setting up of the Central KYC Records Registry (CKYCR). The Central Registry of Securitisation Asset Reconstruction and Security Interest of India (CERSAI) has been authorised to act as and to perform the functions of Central KYC Records Registry. The DCBs and RRBs are required to upload the KYC data pertaining to all new individual accounts opened on or after from April 1, 2017, with Central KYC Registry. Sanction of Rs.62.23 lakh has been accorded to Kerala Gramin Bank, Kerala Sate Cooperative Bank and all DCBs in Kerala for establishment of Central KYC Records Registry (CKYCR).

2.8 Support for Capital Expenditure of RSETIs/RUDSETIs

A total of Rs.41.55 lakh has been sanctioned to all the 15 RSETIs of Kerala for purchase of training equipment. So far, Rs.38.13 lakh to 14 RSETIs/RUDSETIs has been reimbursed. This intervention will result in skill development of youth and improve their employability.

NABARD'S PERCEPTION ON THE DEVELOPMENT PERSPECTIVE OF THE STATE

3.1 Introduction

Kerala, with a population of 33.3 million, leads many other Indian States and territories in terms of per capita income, social development and Human Development Index. At constant (2011-12) prices, the quick estimates of per capita Net State Domestic Product in 2016-17 was Rs.1,28,347 as against provisional estimate of Rs.1,19,777 in 2015-16, recording a growth rate of 7.15% in 2016-17. During the period 2012-13 to 2016-17, the per capita state income at constant prices was higher than the per capita national income. Kerala's rating of **Human Development Index (HDI) of 0.79 is the highest in India**, thanks to achievement of State in the fields of health, sanitation, education and poverty-reduction. The State's **poverty** rate lingers at 7.05%, one of the **lowest in the country** as the national average stands at 21.92%.

A set of high material quality-of-life indicators distributed across nearly the entire population with relatively low per capita income formed the basis for Kerala Model Development, which still puzzles economists. Kerala's strength in high technology, human resource, education and healthcare adds to the Country's comparative advantages. Kerala's economic goals to improve infrastructure, increase agricultural productivity through technology adoption and strengthen its knowledge economy adds to India's economic goals.

3.2 Kerala Agriculture --Current status

Agriculture in Kerala is distinct from the rest of India in terms of cropping pattern and the extent of commercialisation. It has a strong association with the ecological and physiological peculiarities of the State. There has been a discernible shift in the cropping pattern towards cash crops especially rubber. **Nearly 85% of the gross cropped area is under plantation crops.** Agriculture has suffered considerable setback in the recent years, particularly in terms of loss in area under food crops, declining productivity in some niche crops like pepper, tea, coffee, coconut etc. and decline in price realisation to farmers from cardamom and rubber. Only three major crops viz., rubber, banana, and arecanut showed increase in area under cultivation over the years.

The agricultural sector in Kerala is facing a serious crisis of growth. According to data from the Directorate of Economics and Statistics (DES), using 2011-12 as base year, agriculture and allied sectors recorded a growth rate of 1.43 % in the first year (2012-13) of the Twelfth Plan period. The sector witnessed a negative growth rate during the following three years with growth rate of (-) 6.31% in 2013-14, (-) 1.09 % in 2014-15 and (-) 2.9% in 2015-16.

Hunger Free Kerala

The 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development were adopted by world leaders in September 2015. The SDG focuses on ensuring food and nutrition security through five well defined targets to be achieved by 2030 - ending hunger and ensuring access for all, safe, nutritious and sufficient food all year round; end all forms of malnutrition; double agricultural productivity and incomes of small-scale farm producers; ensuring sustainable food production systems; and maintaining the genetic diversity of seeds, cultivated plants and farmed and domesticated animals.

The Zero Hunger Framework through its 2030 agenda aims to end hunger and malnutrition in all forms and in all parts of the country by 2030. Kerala has initiated measures to end hunger in all its form in the State by 2030.

The Government has started a scheme to provide one free meal a day for the needy. In 2017- 18, the scheme has been proposed to be implemented in two selected districts as a pilot project with the help of Kudumbashree units and other voluntary organizations/non-government organizations, who have prior field experience. In line with the State Government policy, several Local Self Government units have directly initiated the scheme to cater the needy.

(Source: Economic Review, 2017)

The average size of operational holding is only 0.22 ha, which is one of the lowest in the country and makes investments in farm sector inherently unviable. The low level of farm mechanisation and area under irrigation combined with high agricultural wage rates have an adverse impact on the production and productivity of agriculture in the State.

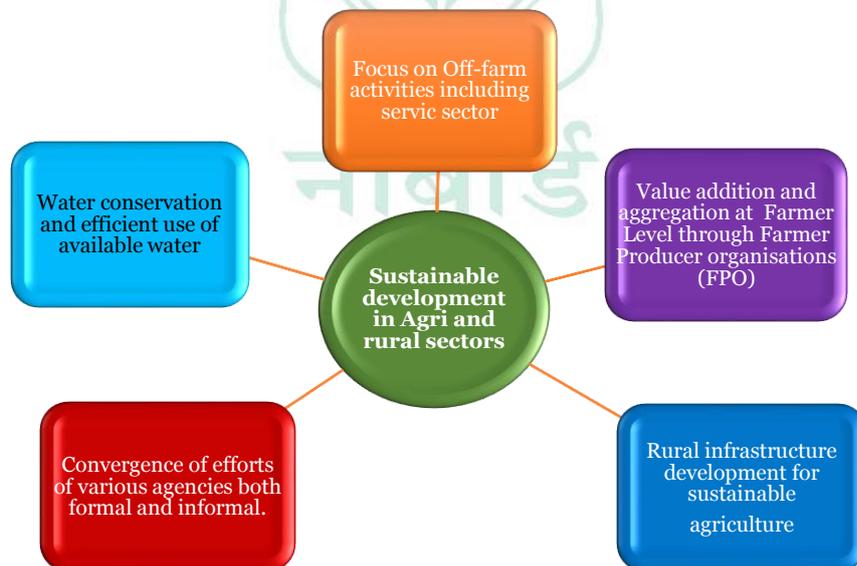
Notwithstanding this, agriculture still forms the backbone of Kerala's economy as approximately one- fifth of the workforce is in the primary sector, directly dependent on agriculture and allied services. It also forms the resource base for a number of agro based industries and agro services.

3.3 NABARD's Perspective for Kerala

The agricultural sector in Kerala has undergone wide-ranging changes in terms of farm size, cropping pattern, cultivation practices and productivity. There has been a phenomenal growth in the number of agricultural holdings leading to the emergence of a large number of very small holdings. Kerala which had a low base in food production in the country continued to face serious challenges in retaining farming area and improving production and productivity of important crops.

With small and marginal category constituting 98% of the total holdings, one of the major challenges faced by the Kerala economy is enhancing the viability of agriculture to improve the growth prospects of the economy. Input use levels have to be continuously increased to maintain the yield at the existing level. This poses a threat to the economic viability and sustainability of crop production. Therefore, the goal of long-term food security can be attained only if agriculture is made sustainable through reforms in agricultural policies and agronomic practices.

The Potential Linked Plans prepared by NABARD reveal five broad, but interrelated themes for the development of the State:



Areas for Focussed attention

The nature, extent and causes of the distress may be viewed from the perspective of the two interrelated strands, agriculture and agrarian. The former is a function of crop production and relates to the inadequacies and inappropriateness of the agricultural development programmes and their impact on the farm. The latter is an impact of distribution and therefore more closely linked to the farmer and livelihood of the people involved in agrarian activities.

Therefore, the development discourse needs to link the distress in agriculture to livelihood issues of people dependent upon the agrarian economy. NABARD perceives that focused attention requires in areas as discussed below:

i. Focus on small and marginal farmers

In terms of production, small and marginal farmers contribute more to diversification and food security. In Kerala, SF/MF contributes the major share in the farmer population. The challenge for Kerala and Indian agriculture is to migrate from tonnage-centric (food grain production level measured in tonnes) to farmer-centric even as the size of holdings shrink in a highly volatile ecosystem. NABARD aims at more concentrated development of SF/MF category of farmers.

ii. Cheaper credit to farmers

Modern agriculture, as distinguished from traditional cultivation, involves substantial investment of recurring nature for using high yielding varieties of seeds, fertilisers, insecticides and costly agricultural implements. In such a situation, arrangements for credit should go much beyond the simple provision of credit and must be linked operationally with productivity and other services. Production and productivity, marketing and raising the level of surplus and savings must, therefore, be the major functions of credit. The benefit of modern technology, the advantages of institutional credit, infrastructural arrangements etc., should accrue to all classes of farmers. Besides, on the supply side, there must be an arrangement for assessing the requirements of funds on the basis of actual cost and raising the resources therefor. NABARD is providing refinance for production purposes at concessional rate of interest to State Cooperative Banks (SCBs) and Regional Rural Banks (RRBs) by way of sanction of credit limits.

Investment credit induces technological upgradation resulting in increased production, productivity and incremental income to farmers and entrepreneurs. NABARD provides Long Term and Medium Term Refinance to banks for providing adequate credit for taking up investment activities by farmers and rural artisans etc. A segmentation approach could be adopted in credit delivery whereby the segment-/sector-specific credit requirements are assessed and differential rates of interest are enabled through subvention (keeping in view the net income per unit from a particular segment/ sector/ activity), to support activities that are critical but not picking up. NABARD's initiative of sanctioning Long term refinance at an interest rate of 4.95% for agriculture under Long Term Rural Credit Fund (LTRCF) to Cooperative Banks and RRBs is a positive step under this segmentation approach.

iii. Providing infrastructure for agricultural development

Infrastructure covers those supporting services that help the growth of directly productive activities like Agriculture and Industry. Infrastructure facilities consist of (a) Irrigation including flood control and commercial area development and (b) Energy, Transport, Communication, Banking etc. Infrastructure is crucial in all types of economy. In low income countries basic infrastructure such as irrigation is most important. In middle income economies demand for transport grows fast. In high income economies power and telecommunication occupy more importance. With the objectives of facilitating development and ensuring prosperity in rural sector, NABARD continued to support initiatives related to rural infrastructure. NABARD has played crucial role in the development of farm sectors like minor irrigation, horticulture and plantation, forestry, land development animal husbandry/fisheries, farm mechanisation, agriculture marketing etc., as well as non-farm sector activities. NABARD has initiated several measures to make the loans under Rural Infrastructure Development Fund (RIDF) more attractive and to increase the reach of such loans.

Besides RIDF, a dedicated Long Term Irrigation Fund (LTIF) is also created in NABARD for funding and fast tracking the implementation of incomplete major and medium irrigation projects. NABARD Infrastructure Development Assistance (NIDA) is a line of credit support for funding rural infrastructure projects. NIDA is available for state governments and other state-owned organizations, such as Corporations. A key feature of NIDA is that, it offers customized terms based on the requirements of the borrower, nature of the project, and risk profile of the borrower. The assistance provided under NIDA is available on flexible interest terms.

iv. Value addition and marketing initiatives for assured market price of agricultural produces

With a view to provide financial assistance to Producer Organizations (POs) to enable them undertake collectivization of primary produce, add value and enhance the income of primary producers, particularly small producers through improved access to quality inputs, modern technology and market linkages, NABARD had set up Producers Organization Development Fund (PODF) during 2011-12. The broad objective of the fund was to support Producers Organizations across three levels, viz. credit support, capacity building and market linkage to meet their end to end requirements and thereby ensuring sustainability and economic viability.

Further, since the PACS and PCARDBs are also one of the legal forms of Producer Organizations, NABARD took special initiative to support PACS / PCARDBs for developing as Multi Service Centres. This enabled PACS / PCARDB to become "One stop shop" for providing ancillary services to its members and also to diversify its activities by providing additional services like custom hiring of agricultural implements, enabling collective purchase of inputs, having good quality storage capacity as per Negotiable Warehouse Receipt System, processing units, marketing facilities, etc. While the credit support to POs and PACS/PCARDBs were being provided out of NABARD's business budget, the grant support towards capacity building, market linkages and other promotional / developmental needs is being provided out of PODF.

Encouraged by the success of financing POs /PACS as MSC by NABARD during the last several years and the policy environment created by the State/ Central Governments in favour of promoting new Farmer Producers' Organizations (FPOs), Govt. of India during Union Budget 2014-15 announced creation of dedicated "PRODUCE Fund" in NABARD and contributed Rs.200 crore to be utilized for promotion and establishment of 2000 FPOs in the country.

Considering the need for specific and focused attention towards meeting the growing credit needs of FPOs, NABKISAN Financed Ltd, a subsidiary of NABARD as also other subsidiaries were given special responsibility to support credit needs of FPOs on affordable terms. Consequently, it was decided to restrict NABARD assistance only to grant support towards accompanying measures to POs/ PACS/ PCARDBs so as to ensure better utilization of loan extended by the lending agencies and achieve long term sustainability.

With a view to supplementing the efforts of the Govt. of India, particularly in 115 Aspirational districts for holistic development, NABARD is implementing "Integrated Water Management Scheme through watershed approach", covering more than 40 such districts to address issues relating to availability and efficient usage of water through FPO/ community participation. Besides, NABARD, through its Regional Offices at state level, has launched a massive awareness campaign on the role of FPOs in building

farmers' resilience against climate change, increasing agricultural productivity and bringing optimal efficiency in the agri value chain through achieving the economy of scale for ensuring enhanced income to the farmers, particularly small producers. In Kerala Wayanad district is covered under the above scheme.

Kerala RO has sanctioned 120 FPOs (including 2 at Lakshadweep) under PRODUCE fund set up in NABARD by the Government of India (GoI) with a total membership of more than 50,000 shareholders. These FPOs have mobilised share capital of nearly Rs.17.00 cr. To give a fillip, the guidelines regarding assistance to the FPOs have been recently revised and the quantum NABARD grant assistance to FPOs increased to Rs.11.440 lakh over a period of 3 years from the earlier limit of Rs.9.06 lakh. Further, the period of assistance is also made extendable up to 5 years on fulfilling certain eligibility criteria. Since Produce Fund assistance is limited to formation and nurturing of the FPOs and that too, for a limited period, FPOs need working capital assistance to commence and sustain their business operations. However, many FPOs have been facing difficulty in getting the loans from banks due to absence of collateral security. Ministry of Agriculture and Farmers Welfare, Govt of India, vide letter dated 22 October 2018, has advised that financing of FPCs by banks may be made a standing issue in the meetings of SLBC/DLBC so that all aspects of credit requirement of FPCs by the banking system is regularly monitored and reviewed. In view of the above instructions of GoI, it is expected that the banks will put in place necessary institutional arrangements to meet the credit requirements of FPCs. A few banks have formed tailor made products to suit the requirements of Farmer Producer Organisations which may be replicated by other banks also.

NABKISAN Finance Ltd, a subsidiary of NABARD, has introduced a number of innovative loan products for directly supporting FPOs besides creating a digital platform for on-line submission of loan applications. To further provide lending comforts to its subsidiaries, NABARD has introduced a Credit Guarantee Scheme on a pilot basis to provide guarantee cover to its lending subsidiaries. Based on the success of pilot, the scheme will be extended to other lending institutions in due course for facilitating adequate credit flow to FPO sector.

3.4 Kisan Credit Card / Rupay Kisan Credit Card (R-KCC)

The KCC Scheme was introduced in 1998-99 as a step towards providing adequate and timely credit to the farmers from the banking sector. Kisan Credit Card is an effective credit delivery tool for providing hassle-free timely and adequate credit. As per the reports available with the Convenor SLBC, 5,44,512 Kisan Credit Cards with an amount of Rs.7,754.03 crore was issued during the year 2017-18 by the banking sector in the State (*Source: SLBC Kerala, June 2018*).

The revised KCC norms also provide for inclusion of incidental requirements of the farmers and their consumption expenses. Banks are also expected to leverage their CBS platforms to provide value added services to farmers like ATMs, anywhere banking, debit cards etc.

In continuation of the Hon'ble Prime Minister's address on 31 Dec 2016 to convert three crore KCC to RuPay Kisan Cards by 31 March 2017 on a mission mode, NABARD is facilitating the RRBs and cooperative Banks under Financial Inclusion Fund.

3.5 NABARD's initiative in Kerala under Farm Sector

NABARD's farm sector initiatives aimed at conservation and management of natural resources, accelerating ground level credit flow by rural financial institutions, incremental agricultural production and productivity, generating rural employment and raising the standard of living of rural poor through credit and grant.

Tribal Development Programme: NABARD has been closely associated with tribal development and sustainable livelihoods through orchard based farming systems. As an integral component of NABARD's Natural Resource Management (NRM) policy of providing sustainable livelihoods, NABARD laid special emphasis on providing support for holistic development of tribal communities with orchard establishment as the core element.

Based on the successful experience of Adivasi Development Programmes, NABARD embarked upon an ambitious program of replicating the wadi model across the country. In this direction, NABARD created a Tribal Development Fund (TDF) with a corpus of Rs.50 crore, out of its profits in 2003-04. The corpus was augmented from time to time. All projects under TDF are implemented by partnering with State Governments, Government of India, NGOs and Corporates.

In Kerala, 19 projects have been sanctioned so far under TDF, involving a financial assistance of Rs.34.11 crore. Of these, three have been completed and 16 are on-going. A cumulative amount of Rs.26.15 crore has been released under various TDF projects as on 31 December 2018.

Aralam Tribal Resettlement Project: NABARD sanctioned Rs.2.58 crore to this integrated tribal development project which aims to provide sustainable livelihood systems for 596 tribal families in block Nos 11, 12 and 13 in Iritty block in Kannur district. The beneficiaries mainly belong to Paniyar and Kurichiyar tribes. This project is being implemented by the Centre for Research and Development (CRD), an NGO based in Kasaragod. An amount of Rs.1.96 crore has been released under TDF as on 31 December 2018.

Tribal Development Project in Vithura Gram panchayat: An amount of Rs.2.48 crore was sanctioned during 2017-18 to provide sustainable livelihood systems for 500 tribal families of Vithura gram panchayat of Thiruvananthapuram district. The beneficiaries mainly belong to Kanikkar tribe. This project is being implemented by the M S Swaminathan Research Foundation (MSSRF). An amount of Rs.0.40 crore has been released under TDF as on 31 December 2018.

Tribal Development Project in Kuttikol Gram panchayat: An amount of Rs.1.60 crore was sanctioned during 2018-19 to provide sustainable livelihood systems for 293 tribal families of Kuttikol gram panchayat of Kasaragod district. This project is being implemented by the FLAME Kerala, an NGO based at Wayanad.

Watershed Development Programme: The Union Finance Minister, in his budget speech for 1999-2000, had announced the creation of a Watershed Development Fund (WDF) in National Bank for Agriculture and Rural Development (NABARD) with broad objectives of unification of multiplicity of watershed development programmes into a single national initiative through involvement of village level institutions and PFAs. In pursuance thereof, WDF was created in NABARD with a contribution of Rs.100 crore each by Ministry of Agriculture, Government of India (GoI) and NABARD.

For Sustainable Development Plan (SDP) in completed watersheds, 65 projects were sanctioned in Kerala; 13 in Kasaragod, 22 in Palakkad and 30 in Wayanad. An amount of Rs.3.68 crore has been released under SDP upto 31 December 2018.

3.6 NABARD's initiatives in Kerala under Off Farm Sector

Promotion of Rural Off Farm Sector assumes significance in the context of the pressing need of reducing rural India's over dependence on agriculture by providing alternate livelihood options and thereby curbing large-scale migration of small and marginal farmers and agricultural labourers to urban areas. Over the past three decades, NABARD designed several refinance and promotional schemes for development of Rural Off Farm Sector and has been making constant efforts to broad base and refine them in response to field level needs. The focus has been on greater credit flow, provision of credit to the unreached and provision of linkages for small, cottage and village industries, handloom, handicrafts and other rural crafts and service sector in the decentralized sector in the rural areas.

Building an entrepreneurial culture and necessary skills among the rural youth and women has been a priority area for NABARD along with developing markets for the rural Off Farm sector. NABARD has also been actively involved in promoting innovations in rural areas in Farm and Off-Farm sectors.

3.7 Policy on Rural Off-Farm Sector

As per extant policy, NABARD provides financial support for providing end to end solutions for promotion of activities which generate or enhance livelihoods under the Rural Off-Farm Sector. A project is expected to cover potential survey, capacity building, infrastructure, support services, marketing aspects, etc., for viable activities under Rural Off-Farm Sector. One or all activities could be covered for support, depending on the availability of multiple stakeholders as part of end-to-end solutions.

- NABARD supports and provides marketing platform to rural artisans and producers to exhibit their traditional art crafts, produce and products through exhibitions which facilitate the artisans in not only utilizing their expertise as source of livelihood but also help them in enhancing their income.
- To enable the artisans not only to sell the products in marketing events, but to market their products and benefit directly from the market feedback for better value realization in future, NABARD extends financial assistance by way of grant for setting up of Rural Haats and Rural Marts. During the year 2017-18 NABARD sanctioned 01 Rural Haat and 03 Rural Marts to FPOs and Farmers' Clubs in the state.
- As an effort to institutionalize the Entrepreneurship and Skill Development initiatives, NABARD provides support to specialised institutions viz., RUDSETI/RUDSETI type of Institutions & RSETIs, which provide entrepreneurship development and training to rural youth/women on various skills, which can generate better livelihood options. Assistance is provided to these institutions, which comply with the criteria stipulated by NABARD. A portal, viz., Nabskill has been developed exclusively for the purpose.
- In order to ensure better income to the producers / artisans through improved technology, skill upgradation, procurement and supply of raw materials, aggregation and marketing of produce / products NABARD facilitates setting up of Off Farm Producer Organisations. The area of focus would be handlooms & handicrafts, agri & allied activities, food processing and small micro enterprises in rural areas.

3.8 Micro Credit Innovation

NABARD, through its' Micro Credit Innovations Department has continued its role as the facilitator and mentor of microfinance initiatives in the country. The overall vision is to facilitate sustained access to financial services for the unreached poor in rural areas through various microfinance innovations in a cost effective and sustainable manner. NABARD has been continuously focusing on bringing in various stakeholders on a common platform and building their capacities to take the initiatives forward. This has resulted in tremendous growth of microfinance sector in India through different approaches like:

- **Self Help Group – Bank Linkage Programme (SHG-BLP):** Based on the observations of various research studies and an action research project carried out by NABARD, the model of ‘SHG Bank Linkage Programme’ has evolved as a cost-effective mechanism for providing financial services to the unreached and underserved poor households. What started as a pilot to link around 500 SHGs of poor to the formal financial institutions during the year 1992-93 has now become the **largest microfinance programme in the world**, in terms of the client base and outreach? The success of SHG-Bank linkage programme attracted the policy makers of the Government to launch social and poverty alleviation programmes in different states. GOI’s flagship poverty alleviation programme the National Rural Livelihood Mission is also based on the SHG approach. NABARD continues with its endeavour to fine tune policies in terms of extending promotional support to NGOs for forming SHGs, capacity building of bankers, NGOs/ VAs, training the SHG members in setting up micro enterprises and livelihood promotion through MEDP and LEDP.
- **Financing of Joint Liability Groups (JLGs):** Apart from extending refinance support of 100% to the financing Banks, NABARD also extends financial support for awareness creation and capacity building of all stakeholders under the Scheme. NABARD also extends grant support for formation and nurturing of JLGs to Banks and other JLG Promoting Institutions (JLGPIs).
- **Micro Enterprise Development Programme (MEDPs):** NABARD since 2006 has been supporting need-based skill development programmes (MEDPs) for matured SHGs which already have access to finance from Banks. MEDPs are on-location skill development training programmes which attempt to bridge the skill deficits or facilitates optimization of production activities already pursued by the SHG members. Grant is provided to eligible training institutions and SHPIs to provide skill development training in farm/off-farm/service sector activities leading to establishment of micro enterprises either on individual basis or on group basis.
- **Livelihood and Enterprise Development Programmes (LEDPs):** As skill upgradation trainings alone have limited impact on livelihood creation among the SHG members, it was thought prudent to create sustainable livelihoods among SHG members and to attain optimum benefit out of skill upgradation and a new scheme titled Livelihood and Enterprise Development Programme (LEDP) was launched.

3.9 NABARD’s new initiatives

E-Shakti

Digitisation pilot project ‘E-Shakti’ has been launched to infuse vibrancy in the SHGs by digitising their data and updating the same on real time basis every month with an inbuilt concurrent grading mechanism and making it available to stakeholders primarily the banks for ensuring credit linkage of SHGs. Resilience of the movement be harnessed to provide seamless savings and credit services at affordable rate to the rural poor especially women. E-Shakti, on a pilot basis, implemented in Kasaragod District and in the third phase is being implemented in four more districts in Kerala viz. Kannur, Malappuram, Idukki and Kottayam. The project is likely to be expanded to 150 districts pan India and another four in the State.

Climate change—Mitigation and Adaptation

A significant share of the current agrarian distress in India may be, arguably, attributable to climate change. While this kind of widespread distress from climatic factors cannot be handled at an individual level, an aggregated solution is more complex to envisage and pre-empt. Management of agrarian distress due to calamities may be addressed through adaptation and mitigation measures.

Adaptation refers to the identification of the occurrence of calamity, location, duration, scale and extent, along with a responsive plan to protect life, property and income that may be necessary. An adequate number of well-equipped and well-manned weather stations, satellites and communication network, along with the capability to process data and information in real-time are prerequisites for an adaptation strategy to be successful.

There is a need to plan infrastructure with attention to detail, for instance, making the communication network capable of effectively delivering warning measures in local languages.

GoK – Thirteenth Five Year Plan 2017- 2022

The 13th Five Year Plan prepared by GoK focuses on regaining the momentum in the economic growth by more than doubling the plan size over five years. The strategy for the 13th Plan as a whole includes:

- Building a new Kerala through the four missions announced by the Government of Kerala
 - High-quality school education
 - People-friendly health facilities (Aardram)
 - Nature-friendly agriculture, waste management, a clean environment, litter-free Kerala, clean water bodies and enhanced water resources (Harita Keralam)
 - Secure housing and livelihoods (LIFE Mission)
- Increasing material production in agriculture and industry.
- Generating employment, skill development, livelihood security, and entrepreneurship.
- Strengthening Kerala's physical and social infrastructure.
- Strengthening the financial infrastructure.
- Expanding the role of modern science and technology in society and production, promoting sustainable development, and the modernisation of governance and administration.
- Deepening people are planning by local governments.
- Extending social protection and the struggle against social exclusion.
- Promoting activities centered on heritage, culture, the promotion of tourism, and building cultural and economic ties with non-resident Malayalis.

The plan size of the state for the 13th Five Year Plan period projected at Rs.2,00,000 cr.

NABARD has been accredited as the National Implementing Entity (NIE) for Adaptation Fund in July 2012 in India. NABARD in the capacity of NIE can access Adaptation Fund from AFB for implementation of feasible climate adaptation projects posed by eligible Executive Entities such as Central/State Government Departments, NGOs, Research Institutions and Technical Institutions etc.

NABARD is supporting projects many of which can be classified under climate finance. Over 28% of NABARD's cumulative disbursements have links with climate change adaptation and mitigation. Specifically, NABARD's thematic areas of forestry, agriculture, animal husbandry, land development, minor irrigation, etc., have projects / components with emission reduction potential. Apart from these, areas like farm mechanisation, Self Help Groups, Storage & Market Yards, etc. have some linkages with climate change adaptation.

Promotion of Integrated farming systems of Kaippad and Pokkali in coastal wetlands of Kerala

The project was sanctioned under NAFCC in 2015. The total cost of the project is Rs.25 crore. The period of the project is four years (2015-19). The Agency for Development of Aquaculture (ADAK), Department of Fisheries, Government of Kerala, is the Executing Entity of the project. The proposed area of the project is 600 hectares (300 hectares in Kannur District and 300 hectares in Ernakulam, Thrissur and Alappuzha districts). The broad objectives of the project are to strengthen the outer 'bunds' with sufficient height; use of tall varieties of salt tolerant paddy; integrating fishery to enhance paddy cultivation and maximize the inland fish production through sustainable aquaculture. The project will help simultaneous cultivation of rice and shrimp / fish in low-lying wetlands where there were no cultivation earlier. It will also improve the quality of life for local farmers through higher disposable incomes. It will improve access to fresh water, as peripheral 'bunds' will prevent seepage of sea water to fresh water sources, capacity building of farmers and will reduce displacement of labourers from nearby areas and provide

employment to women. It will also check carbon emission, as wetlands have good potential to act as carbon sink.

An amount of Rs.12.65 crore has been released under the project so far. Implementation of the project has led to revival of fallow land and approximately 250 ha Kaipad & Pokkali land were brought under cultivation. The productivity of land has increased, as also the per capita income of people. Overall wetland ecosystem is being utilized and the biodiversity is increased. The whole project wetland area is under transformation.

Financial Inclusion

Financial inclusion, financial literacy and consumer protection are the three major pillars of financial stability. Financial inclusion acts from the supply side covering issues like financial markets, network of banks and other financial institutions, appropriate design of products and services, etc. Financial Literacy Centres (FLCs) are expected to create awareness and enable the consumers to take informed decisions.

With the persistent efforts of RBI, NABARD & SLBC, Financial Literacy Centres (FLCs) were established in all the 152 blocks of the State. All 14 DCBs and Kerala Gramin Bank have been supported with 24 FLCs and 07 FLCs, respectively. As on 01 January 2019, a cumulative amount of Rs.2.02 crore has been sanctioned and Rs.1.37 crore has been disbursed towards FLCs.

The FLCs / FLCCs / Livelihood and Credit Counselling Centres established and maintained by the banks serve as a beacon towards creating financial literacy awareness among the people by way of conducting camps / campaigns in the villages / blocks, door-to-door canvassing, debt restructuring, family budgeting, livelihood income generation counselling, etc.

3.10 Doubling of farmers' incomes by 2022

Hon'ble Finance Minister Arun Jaitley in his Budget Speech on February 29, 2016 announced the scheme for doubling of farmers' income in the country over a period of seven years, by 2022-23. Subsequently, the Prime Minister's seven-point action plan for doubling farmers' income took shape and is as follows:

- i. Enhanced focus on irrigation with large-scale investments, with the aim of 'per drop more crop'
- ii. Availability of quality seeds and nutrients
- iii. Large scale investments in warehousing, cold chains and storage facilities
- iv. Value addition through food processing
- v. Risk management through introduction of crop insurance schemes
- vi. Setting up a national farm market
- vii. Promoting ancillary activities like poultry, fishery etc.

The Government of India has in the past, initiated several measures for providing adequate support to the agriculture sector in the country, keeping in mind the food security perspective as also the dependence of about half of the country's population (48.9%) on the sector for its livelihood. Some measures introduced by the Government in the past one and a half decades with an eye on the welfare of agriculture sector include the Doubling of Agriculture Credit Programme (DACP), Interest Subvention Scheme for Short Term (ST) crop loans, Agriculture Debt Waiver and Debt Relief Scheme etc. Doubling of farm incomes by 2022 is the latest in a series of steps by the Government to ensure the welfare of farmers in the country.

Kerala- state of agriculture

Kerala belongs to a high-rainfall zone, with average rainfall being about 2,500- 3,000 mm. The climate in Kerala is Agriculture in Kerala is distinct from the rest of the country, with plantation crops predominantly contributing to the overall value of output from the agriculture sector. Kerala is also unique for its homestead cultivation, with home gardens estimated at around 64 lakh in numbers.

Income patterns of farm households in Kerala

As per the report of the Ashok Dalwai Committee on “Doubling Farmers’ Income (DFI)”, the average annual income of the farmer at the national level in the base year 2015-16 is to be taken as Rs.96,703. Therefore, the targeted farmers’ income at national level, in 2022-23, is to be doubled to Rs.192,694 (at 2015-16 constant prices) or Rs.271,378 at current prices. This is inclusive of both farm and non-farm incomes. In case of Kerala, the average annual income in the base year at current prices is Rs.155,788, which in the target year 2022-23 is to be increased to Rs.3,27,708 at current year prices and Rs.2,47,682 at current prices. In order to achieve the targeted income levels by 2022-23, the farm and non-farm income growth has to grow at 9.85 per cent and 5 per cent in Kerala respectively.

The DFI Committee in its report has identified the following seven major sources of growth that will contribute to doubling the farmers’ income:

- i. Improvement in crop productivity
- ii. Improvement in livestock productivity
- iii. Resource use efficiency or saving in cost of production
- iv. Increase in cropping intensity
- v. Diversification towards high value crops
- vi. Improvement in real prices received by farmers
- vii. Shift from farm to non-farm occupations.

The Dalwai Committee has also suggested improving the ratio between farm and non-farm income from 60:40 as of now, to 70:30 by 2022-23. It has suggested the following strategies in this regard:

- a) Adopting a “demand-driven approach” for efficient monetisation of farm produce and to synchronize the production activities in Agriculture & Allied Sectors.
- b) Improving and optimizing input delivery mechanism and overall input efficiency [technologies, irrigation methods, Mechanisation, Integrated Pest Management (IPM) Integrated Nutrient Management (INM), farm extension services, adaptation to climate change, integrated agri-logistics systems, Integrated Farming Systems Approach, etc.].
- c) Offering institutional credit support at the individual farmer and cluster levels.
- d) Strengthening linkages with MSMEs (micro, small and medium enterprises), so as to accelerate growth in both farm as well as non-farm incomes along with employment creation

Recommendations of the “Strategy Document for Kerala for “Doubling Farmers’ Income by 2022, by ICAR, New Delhi

The Indian Council of Agricultural Research (ICAR) had set up a State-level Co-ordination Committee, for states to chalk out strategies to double farmer’s income by March 2022. The committee, in consultation with various stakeholders and partners and with assistance from several documents, as chalked out a strategy for doubling farmers’ income in the state by 2022. A summary of the recommendations are as follows:

Strategy 1 Productivity enhancement	Strategy 2 Utilizing waste lands/fallow lands for enhancing production
<p>i. Integrated Farming System: Integrated farming systems should be promoted in Kerala for eg:</p> <ul style="list-style-type: none"> • rice-banana, • coconut + one rice +one fish model in Kuttanad ecosystem; • promotion of Pokkali farming, • cage farming of brackish water fish species, • Introduction of profitable and proven rotational cropping practices like Rice-prawn, Rice- fresh water fish etc. in suitable locations; • integration of suitable and profitable enterprises viz., fishery, duckery, piggery, livestock rearing, apiary etc. along with rice cultivation, for each agro-climatic zone; • Multistoried cropping (pepper+ teak+ mango+ jack); kitchen garden; poultry unit + vermicompost unit + cow; • Terrace garden+ water harvesting etc. • Establishment of seed production units for large scale production certified HYV seeds of rice; • Adoption of high yielding varieties of pulses and oilseeds suited to each locality and situation, • Plant protection measures, shade regulation, timely and adequate manuring, moisture conservation measures, open precision farming, timely under planting etc for spices; • Identification and popularization of location-specific improved varieties etc. • Improving water use efficiency by proper lining of channels and reducing runoff in the field by proper levelling, • Economizing water use by adopting phasic stress irrigation schedule, • Fertigation and foliar application of nutrients for yield enhancement of major crops of Kerala, Soil Test Based Site specific, Crop Specific Nutrient Management for enhanced returns. 	<ul style="list-style-type: none"> • Re-cultivation of fallow lands. • Reclamation of degraded lands • Terrace and contour making in difficult terrain lands for arable purpose. • Adoption of soil conservation measures and installation of bunds and other artificial structures to check erosion. • Growing cover crops in sloppy areas. • Consolidation of fragmented holdings. • Restricting conversion of farm lands for commercial purposes. <p>Strategy 3 Promoting Climate Smart Agriculture (CSA)</p> <ul style="list-style-type: none"> • Identifying and diagnosing impacts of climate change with reference to specific crops and local conditions. • Managing landscapes for improving sustainability, building resilience and mitigating adverse impacts. • Water management at watershed and river basin for minimizing vulnerability of production systems. • Promotion and extension of improved technologies i.e., seed, integrated nutrient management (INM) including micronutrients, soil amendments, integrated pest management (IPM), input use efficiency and resource conservation technologies along with capacity building of the farmers/ extension functionaries. • Demonstration and popularization of heat and salt tolerant crop varieties, promotion of micro-irrigation system, etc. • Training of extension functionaries/ farmers on climate change adaptation and mitigation practices.

3.11 Major changes in Ecosystem

Impact of Devastating Floods

Kerala had witnessed unprecedented rains during August 2018, which resulted in floods and landslide causing massive destruction to life, livelihood, property and infrastructure. 1,259 villages across 13 districts were declared as flood affected by GoK.

UNDP, after assessment of the damages, has estimated an investment requirement of Rs.31,000 crore for rebuilding Kerala.

Steps for mitigation

To help the State to tide over the situation, NABARD had initiated the following steps:

Increased the normative allocation under RIDF from Rs.500 crore to Rs.900 crore.

- For supporting crop production at concessional interest rate of 4.5%, refinance assistance under ST(SAO) was increased from Rs.1,100 crore to Rs.1,500 crore.
- For financing long term investments in agriculture and allied activities at concessional rate of 4.95%, State was allocated assistance to the tune of Rs.1,000 crore
- For financing Short term working requirements of artisans, industrial societies, etc., a credit limit of Rs.2,000 crore was allocated to the State.

State initiative

Livelihood Rehabilitation Plan: As part of the measures taken by the State Government for revival of economic activities in the flood and land-slide affected regions of the state, the Kerala State Planning Board has initiated a Livelihood Rehabilitation Planning Process to cover the flood affected areas. One of the important components of the package is the livelihood rehabilitation credit plan which focusses on credit flow to flood affected regions of all the 14 districts, covering agriculture, fisheries, animal husbandry and dairy industries etc. A rehabilitation credit plan aggregating to Rs.2413.23 crore was prepared in respect of Agriculture, Animal Husbandry, Fisheries, SME and other priority sectors in respect of the worst affected districts, viz., Wayanad, Idukki, Thrissur, Ernakulam, Alappuzha and Pathanamthitta. The same has been suitably incorporated while estimating credit projections in the PLP for the year 2019-20.

Resurgent Kerala Loan Scheme (RKLS): State Government accords sanction of a new financial aid scheme RKLS with an aim of giving support to regain the life and livelihood and to hold and pacify those who stands in misery of the worst hit natural disaster. The interest-free-loan of Rs.1.00 lakh is facilitated through Kudumbashree for purchase of domestic appliances and other purposes, and the Government will sub-vent the interest.

Ujjivana Loan Scheme: Kerala Government has come out with a scheme called Ujjivana Sahaya Padathi (Ujjivana Support Scheme) a programme for re-building livelihood victims of flood affected through Bank Loan. The scheme covers cultivators, dairy/ poultry farmers, ornamental bird hatchers, small and medium enterprises, shop and establishments. The Scheme Details are:

- Envisages Margin Money assistance on Term Loans availed for rebuilding livelihood to the extent of 25% subject to a maximum of Rs.25 lakh.
- Beneficiaries availing only Working Capital TL options are there for Margin Money up to 25% subject to Rs.1 lakh or interest subvention up to 9%.
- For KCC holders, an additional subvention of 4% over and above the interest payment and prompt payment incentive scheme of GoI, so that the loan becomes interest free.

3.12 Conclusion

The planning process is as important as the plan itself. A good plan created in isolation almost guarantees a lack of ownership among those who are expected to implement it. *NABARD envisages more convergence in implementation of such plans as convergence brings synergy between our plans and different government programmes and /or schemes in term of their planning, process and implementation.*

Perspective Plan 2030

- Foster global competitiveness, growth and profitability in the sector to attract new investment.
- Build lasting partnerships among public, private, and other community stakeholders.
- Increase creation of wealth in agriculture in rural areas.
- Improve investor confidence leading increased domestic and foreign investment in agricultural activities and rural areas.
- Promote sustainable use of agricultural resources.
- The average agricultural growth rate will be 2% per annum.
- Improved farming efficiency will be achieved despite the expected drop in agricultural area
- Expenditure allocation towards agricultural research and education will be raised to 1-2% of GSDP of Agriculture by 2030.

CHAPTER **POTENTIAL CREDIT OUTLAYS UNDER VARIOUS** **SECTORS**

4

Introduction

NABARD prepares State Focus Paper (SFP) on an annual basis to project credit potential under priority sector covering Primary, Secondary and Tertiary sectors, with emphasis on the Primary sector. These projections are based on parameters such as availability of exploitable resources, cropping pattern, technical feasibility, agriculture practices, availability of infrastructure, and other developmental indices such as access to markets, etc. Some of these parameters may have undergone a change in the State since the finalization of SFP for the previous year on account of factors such as changes in government's priorities and policies, strengthening of rural infrastructure, market forces, cost escalation, impact of the recent floods, etc., necessitating a relook at the credit potential for the year 2019-20.

Further, the State Focus Paper 2019-20 has been prepared to align with the revised Priority Sector Lending (PSL) guidelines issued by RBI. Priority Sector has been broadly classified into eight categories viz., (i) Agriculture (ii) Micro, Small and Medium Enterprises (iii) Export Credit (iv) Education (v) Housing (vi) Social Infrastructure (vii) Renewable Energy and (viii) Others. Agriculture Sector is broadly divided into three sub sectors viz.,

- (i) Farm credit
- (ii) Agriculture infrastructure and
- (iii) Ancillary activities

Factoring in the changes in the Government policies and priorities and based on the revised PSL guidelines, the credit potential for 2019-20 has been reassessed and presented in the following chapters.

Potential under Total Priority Sectors

The aggregate credit potential for 2019-20 for overall priority sector has been assessed at Rs.1,46,162.78 crore which is 6.50% increase over 2018-19. The sub sector-wise credit potentials assessed for 2019-20 is given in the Annexure I.

4.1 Credit Potential for Agriculture

4.1.1 FARM CREDIT

Short term credit for production, marketing and food security

Introduction

About half of the population of the country is either wholly or significantly dependent for their livelihoods on some form of farm activity – be it agriculture, horticulture, animal husbandry or fisheries. Thus increase in farm income is still the most potent weapon for reducing poverty. Non-farm income opportunities such as post-harvest operations, maintenance of farm equipment, etc., enable diversification and expansion of farm activity to that of rural non-farm income opportunities.

While rural income has increased and rural poverty has reduced over the years, the gap between urban and rural income has widened quite sharply more so because the pace of growth in agriculture has been slower than that of other sectors. Furthermore, the employment growth in non-agriculture has not been sufficient enough to reduce the population dependent on agriculture. Increasing the proportion of income due to farmers out of the price paid by the consumer should be the focus while improving farm production.

The agricultural scenario of Kerala is unique because of its land utilization and cropping pattern. The rainfall coupled with the undulating land topography leads to soil and water run off making soil and water management central to promote sustainable farming. The predominance of cash crops, especially rubber and pepper and other spices whose prices are determined based on international markets, high cost of labour and uneconomic size of operational holding render the farmer's income vulnerable.



Topography and Rainfall

Kerala has three natural divisions: lowland, mid land and high land, forming parallel belts across the length of the State. The low land (890 mm to 3560 mm annual rainfall) with stretches of sand and backwaters on the western fringe of the State along the sea shore is suited for the cultivation of coconut and paddy. The midland region (890 mm to 3560 mm annual rainfall) with hills, valleys and numerous rivers are suitable for crops like rice, coconut, pepper, cashew, ginger, tapioca and rubber. The highland (1400 mm to 3940 mm annual rainfall) which consists of mainly mountains covered by dense forests bordering the Western Ghats is home for plantation crops like tea, cardamom, coffee and pepper.

During the year 2018, the State witnessed devastating floods unprecedented since 1924, resulting in heavy loss of standing crops and damage to assets. This has severely impacted the agriculture scenario and the farming community of the state, which is still reeling under the after-effects of recent floods and heavy rains.

Soil and Soil health

Soil test based nutrient management has emerged as a key issue in efforts to increase agricultural productivity and production.

Kerala has in all 33 soil testing laboratories which include 14 district soil testing labs, 10 mobile labs, one central soil and plant healthcare lab, one central soil analytical lab and 7 regional soil analytical laboratories with an annual analysing capacity 2.22 lakh samples. Considering a net sown area of 20.43 lakh ha and 68.31 lakh operational holdings, there is scope for setting up more labs. The capacity of the laboratories may be upgraded for analyzing micro nutrient status of soil.

Soil health cards are being issued which are a part of the larger objective of Soil Based Plant Nutrient Management which is an ICT enabled farmer centric soil nutrient management and advisory system for Kerala. It is a multi-institutional project initiated by the Department of Agriculture, Govt. of Kerala.

There has been considerable change in the soil texture and quality due to the severe flooding and erosion of top-soil in the recent devastating floods. Hence, immediate measures have to be initiated for soil-amelioration and for regaining the soil health for augmenting productivity.

Inputs

a) Seeds

The State Seed Authority is involved in the production of good quality paddy seeds which is carried out in association with Kerala Agriculture University, State Seed farms, Krishi Bhavans and farmers of registered Padasekhara Samithies at the panchayat level. There are 64 state owned farms in the state out of which 50 are under the control of District Panchayat and 14 under the Department of Agriculture. These include 33 State Seed Farms, 13 district farms, 14 special farms. This is in addition to the network of the seed farms being maintained by the Commodity Boards like Coconut Development Board,

Rubber Board, Spices Board etc., State Horticulture Mission and Vegetable and Fruit Promotion Council Kerala (VFPCCK). Kerala produces around 8,000 MT of paddy seed and the requirement of the state is around 16,000 MT, which is being met through sources outside the state. The total vegetable seed requirement estimated for the State during 2015-16 was 690 MT against which the estimated availability is 193 MT.

The emphasis on high value agriculture by the State Government and promotion of fruit and vegetable cultivation in homesteads and terrace in urban areas needs to be supported by increased supply of quality seed/planting materials.

A viable seed supply chain can be developed for crops like rice, vegetables, roots and tubers, ornamental plants, etc., with tie-up between research institutes, KVKs, and farmers' collectives like co-operative societies and producers' organisations, SHGs, NHGs, etc. The 'One Village, One Product (OVOP)' movement practiced in Thailand, Japan and Nepal may be explored.

b) Fertilizers

The usage of fertilizers among the farmers of Kerala is relatively low. Another reason why Kerala consumes lower fertilizers could be that its cropping pattern is dominated by plantation crops where the consumption of fertilizers is dependent on the output price realized by the farmer. As per Agricultural Statistics at a Glance (2016) the average consumption of fertilizer of the state is 43.78 kg/ha as against the national average of 130.66 kg/ha.

Soil health being central to crop productivity, the use of bio fertilizers has gained prominence and there is a huge demand for it. There are 43 registered organic fertilizer manufacturers in the state. The State Government is coming up with Quality Control laboratory for bio fertilizers and bio pesticides at Pattambi, Palakkad district.

As Precision / High Tech farming and Micro Irrigation schemes are being taken up by progressive farmers, there is a demand for Water Soluble Fertilizers (WSF) / Liquid bio fertilizers for various crops as this provides optimum quantity of water & nutrients in well balanced proportion directly to the active root zone.

The State Government has embarked on a mission to promote safe to eat brand and make Kerala organic. There is a need to scale up existing capacities in respect of bio pesticides & fertilizers, regulate their quality, develop certification standards for safe to eat products and promote exclusive marketing channels for organic products

c) Irrigation

As per the Agri-statistics data (2016-17) published by Department of Economics & Statistics, Kerala, the gross irrigated area in the state as on March 2017, is 4.974 lakh ha and constitutes 19.23% of the gross cultivated area of 25.84 lakh ha. Other aspects relating to irrigation are discussed in the Chapter 'Water Resources'.

d) Credit

Credit is an important component for agricultural production. The Banking System has been working closely with the State Government to ensure availability of timely and adequate credit to the needy farmer without any hassles. The credit flow under crop loans has increased more than three-fold between the period from 2008-09 to 2017-18.

Credit flow for Crop loans through various agencies (Rs. crore)

Year	CBs	Coop. Banks	RRBs	Other agencies	Total
2008-09	8,134.17	4,393.65	2,057.96	19.33	14605.11
2009-10	10,877.95	5,978.67	3,022.43	2.17	19,881.22
2010-11	14,458.60	6,322.30	2,730.38	74.98	23,512.03
2011-12	24,611.99	3,166.96	2,727.33	-	30,506.28
2012-13	22,471.37	7,596.65	2,583.60	-	32,651.63
2013-14	24,628.28	8,366.33	3,873.81	3.24	36,871.66
2014-15	26,020.03	10,874.57	4,783.95	6.20	41,684.75
2015-16	25379.69	11235.47	5239.02	0	41854.18
2016-17	24735.17	8759.34	6915.10	0	40409.61
2017-18	31712.08	8506.49	8024.22	0	48242.79

During the year 2017-18, the achievement of Rs.48242.79 crore under short term credit represented 113.47% of the annual target. However, the pace of offtake of short term credit during 2018-19 is rather slow on account of the floods, as indicated by the level of achievement of 45% of the target as on 30 September 2018.

As part of the measures taken by the State Government for revival of economic activities in the flood and land-slide affected regions of the state, the Kerala State Planning Board has been entrusted with the task of formulating a Livelihood Rehabilitation Package to address the needs of the people. One of the important components of the package is the livelihood rehabilitation credit plan which focusses on credit flow to flood affected regions of all the 14 districts, covering agriculture, fisheries, animal husbandry and dairy industries etc. The credit plan has been prepared by the District level livelihood credit committee under the chairmanship of District Collector, involving DDM, NABARD as a member. The credit package will also suggest the grass root level plan for effective implementation in coordination with the local self-governments. The credit flow is expected to get a fillip with the enabling environment being created thanks to these policy measures.

The Interest Subvention Scheme of GoI which started in 2006-07 continues for the year 2018-19 under which, Short Term crop loans upto an individual limit of Rs.3.00 lakh are disbursed at 7% interest per annum. Interest subvention is also being extended for loans against Negotiable Warehouse receipts by GoI. However, there has not been any off take against this scheme.

An analysis of GLC flow to agriculture in Kerala has shown that, though it has been growing at a high pace during the last decade, there is no concomitant change in real sector indicators, pointing either to the negative marginal productivity of credit or diversion of agricultural credit (from formal sources) to other purposes. The instruments (and mechanisms) for distribution and monitoring of credit may, therefore, have to be fine-tuned for enabling better impact. Interest subvention claims for crop loan have to be duly certified by the bank manager on its utilization and wrong statement and claim need to be strictly avoided.

Kisan Credit Card

Kisan Credit Card is an effective credit delivery tool for providing hassle-free timely and adequate credit. As per the reports available with the Convenor SLBC, 5,44,512 Kisan Credit Cards with an amount of Rs.7,754.03 crore were issued during the year 2017-18 by the banking sector in the State (*Source: SLBC Kerala, June 2018*).

The revised KCC norms also provide for inclusion of incidental requirements of the farmers and their consumption expenses. Banks are also expected to leverage their CBS

platforms to provide value added services to farmers like ATMs, anywhere banking, debit cards etc.

The banks can use the Rupay network for issue of smart cards or debit cards with KCC so that the farmer is able to obtain all the services at convenience.

Progress in issue of KCC through various agencies

Name of implementing agency	Cumulative disbursement during the year 2017-18		Total balance o/s as on 31.03.2018	
	No.	Amt. (₹crore)	No.	Amt. (₹crore)
Comm. Banks *	244401	5202.22	555786	12237.61
RRBs	139469	1213.04	148611	1274.65
KSCB (DCBs)	159917	1325.60	991948	2966.22
KSCARDB	725	13.17	1196	18.21
Total	544512	7754.03	1697541	16496.69

* Including Private sector Banks

Source: SLBC Kerala, June 2018

Insurance

The small holdings of farmers, vagaries of nature make farming an inherently risky proposition and make the farmers vulnerable. Insurance is a risk mitigation mechanism. The extent of coverage of farmers under various insurance schemes and compensation disbursed during 2014-15 is given below:

Coverage of farmers under various insurance schemes

During 2016-17, 89,862 farmers were enrolled under the restructured State Crop Insurance Scheme covering an area of 53,161 ha and an amount of Rs.159.87 lakh disbursed towards claim amount for 2478 farmers insured under the scheme.

Under Restructured Weather Based Crop Insurance Scheme (RWBCIS), a component under NCIP, 10 crops (paddy, banana, ginger, turmeric, pineapple, arecanut, cardamom, pepper, nutmeg and sugarcane) were notified in 12 districts except Alappuzha and Pathanamthitta. Under RWBCIS, during kharif 2016, season, 31,532 farmers were insured covering an area of 21,435 ha and an amount of Rs.17.19 crore was paid as claims to 21,046 farmers and during rabi season, 27,459 farmers were insured covering an area of 18,703 ha. Cool season crops of Idukki and Wayanad districts viz. cabbage, carrot, garlic, French beans and potato was notified under RWBCIS for the first time during the period.

Coconut Palm Insurance Scheme (CPIS) is being implemented in all districts and a total claim of Rs.2.70 lakh was settled among 403 insured farmers covering an area of 250 ha.

During 2016-17 Rabi season, the State government had notified the scheme Prime Ministers Fasal Bima Yojana (PMFBY) covering the crops such as paddy, banana, tapioca and plantain. Paddy is notified in the districts of Alappuzha, Kottayam and Pathanamthitta. Under PMFBY, 18,415 farmers were insured covering an area of 12,961 ha and an amount of Rs.55 lakh paid to 341 farmers as claims (Source: Economic Review 2017).

Extension

The Krishi Bhavans, Agricultural University, Commodity Boards and agencies like VFPC and private players are the major players in the extension system for agriculture in Kerala.

Improving the effectiveness of the ongoing extension services and delivery mechanism by making them more responsive and accountable to the farmers should be prime focus of

the Government. Govt has taken the following initiatives to strengthen the extension services:

- Providing vehicles to increase the Mobility of Extension staff at Block level
- Providing extension services through select farmers as peer to peer interaction would help better information flow through LEAD scheme
- Extensive usage of the IT based applications and Audio video communications like TV Channels.

KISSAN Kerala (Karshaka Information Systems Services and Networking) is an integrated, unique, multi model, ICT enabled agricultural extension system, which provides several dynamic and useful information and advisory services to the farming community across Kerala. It is one of the leading citizen centric e-governance projects of the Department of Agriculture, Govt of Kerala

The multi models of KISSAN are;

- KISSAN Krishi Deepam (Agriculture based weekly T V Programme)
- KISSAN online Agri Advisory Service (www.kissankerala.net)
- KISSAN online video channel ([Youtube.com/kissankerala](https://www.youtube.com/kissankerala))
- KISSAN Tele services
- KISSAN SMS based agri advices
- KISSAN online audio portal

Issues, Constraints, opportunities & emerging trends

Land Reforms – Facilitating land use & Bringing more land under cultivation: The structural issues like small land holding, absentee landlordism, high cost of labour, low productivity etc. make the already vulnerable farmer face enhanced risks. In this context, pursuing farming has become a risky proposition.

Despite the intensive efforts of the Government to promote collective farming through groups like Haritashree, their weak linkage to the banking system is a clear pointer to the fact there is a requirement of intervention from the Government and banks.

The banks are not able to provide credit to these groups as the usage rights of the land being taken up for cultivation by such groups are not available. The Kerala Land Reforms Act, prohibits leasing of agriculture land. The legacy of land reforms prevents the owners from leasing the land for agricultural use. It is in this context, Government should initiate steps to provide a legal backing for transfer of usage right of land to lessees and protect the ownership of the land.

Digitization of land records could be one solution for separation of usage rights from the ownership rights. Many of the States have already commenced the work on digitization of land records. The Karnataka model of digitization of land records could be considered for replication by the Government of Kerala.

Credit flow and Production: Despite the increase in the credit flow, one of the major issues is the outreach of adequate credit to the needy in time. The credit flow to the sector has been distorted by indiscriminate issue of agri gold loans without reckoning the end use of such credit. Keeping this in view, there is a need to look into the end use of the credit from the banks towards crop loan.

The Cooperative Credit Institutions which are more close to the farmers, are not able to meet the requirements of the farmers due to structural issues relating to regulation. Thus the beneficial schemes of the Government like Interest subvention scheme are not able to reach the farmers under the cooperative fold to the extent desired. It is imperative that the financial health of these institutions are to be improved.

Capacity Building: There is an urgent need to bridge the skill gap of the farmers, especially when the State Government intends to make the farmers agripreneurs and also its emphasis on high tech farming / precision farming. The literate farming class in the State needs to be empowered by providing appropriate knowledge and new technologies and processes which can reduce drudgery and at the same time add value to their produce.

The present status of low share of the farmer / producer in price being paid by the ultimate consumer needs to be changed by appropriate institutional interventions like Farmer Producer Companies. The Government's initiatives in promoting FPOs are a step in the right direction.

Many a time, activities like grading, sorting can add value to the produce by a significant proportion. Farmers may be empowered to perform value addition activities at the farmer level either at his own level or in a group based approach.

The farmers clubs, promoted by banks, NGOs, KVKs and supported by NABARD, are association of farmers which could be utilized for the purpose of capacity building. They can be supported to act as pressure groups which can combine work for their common interests.

Weak Extension: The present extension network of the Government is not adequate to meet the demand of the farmers. The Krishi Bhavans which are the centres of extension activity are also saddled with many other responsibilities and are under staffed. Hence the quality of the services being provided by them is far from adequate.

Agriculture Marketing: The absence of marketing and storage facilities for the farmers at convenient locations has been a limiting factor for the farmers. The provision of such facilities also enable farmers to obtain credit on produce.

The attempts of the Government to facilitate marketing through HortiCorp, VFPCK could achieve limited success. The efficient backward and forward linkages in the farm value chain facilitates better value realization at the farmer level.



Suggested Action Points

Government

- Appropriate legislative mechanism may be evolved for promoting lease of agriculture land / fallow land to facilitate credit flow for farming
- Promote group farming activities and setting up of *in situ* processing units in group mode
- Continued facilitation of production and post-harvest activities in Special Agricultural Zones (SAZs) to intensify production and productivity
- Digitisation of land records facilitating easy transfer of usage rights and ownership rights
- Increase the capital expenditure towards agriculture which would enhance the productivity.
- Improve efficiency of State Farms and land use
- Develop a policy for lease of state farms to FPOs and JLGs for seed production / production of quality plant saplings
- Initiate steps for increasing the efforts for extension and agriculture research to bridge yield gaps
- Initiate steps for supply of quality inputs at appropriate time in required quantum
- Initiate measures for providing assistance for GAP certification
- Promote cultivation and processing of location specific crops particularly minor millets in

identified pockets to ensure food and nutritional security of local population.

- Promote setting up of incubation centres and common facility centres for value addition
- Improving the financial health of Cooperatives
- Setting up Automatic Weather Stations in all the Krishi Bhavans to expand the coverage of Weather based Crop Insurance
- Providing training for farmers in various aspects of farming especially in the new technologies and new farming practices
- Provide handholding support, guidance cell for farmers to venture into new areas of farming technology like precision farming, high tech farming
- Providing opportunities for marketing of produce and creating a network of marketing infrastructure for storage, transport and sale
- Create infrastructure for post-harvest processing and storage and accredit warehouses so that the receipts issued by these warehouses can be negotiable warehouse receipt and used by farmers for accessing cheap credit from the banking system
- Encourage peer learning, group approaches among farmers. The existing network of farmer clubs promoted by NABARD and groups promoted by ATMA, VFPC can be leveraged for the purpose
- Promotion of Farmer Producer Organisations
- Adopt a holistic and coordinated approach involving all the field level institutions in the process of development.
- Leverage funds available with the banking system and encourage the culture of good repayment ethics
- Adopt a need-based approach to support agriculture related subsidies.

Banks

- Actively promote investment in agriculture.
- Ensure end use of credit in respect of agri gold loans and follow instructions of RBI in this regard.
- Educate farmers about various products like KCC and make facilities available to them
- Issue KCC enabled Rupay cards for seamless transactions by farmers.
- All the bank branches to ensure coverage of all eligible farmers, including oral lessees, tenant farmers, etc. under KCC. All KCC holders have to be covered under PAIS.
- Continue to support farmers clubs and facilitate their graduation to a pressure group and / or micro enterprises.
- Actively support Producers organizations.
- Promotion of joint liability groups (JLGs) covering tenant farmers, share croppers, oral lessees, small/marginal farmers, etc., should be given utmost importance/attention by the banks.
- Improve the banking touch points in district with less credit intensity to make distribution of institutional credit more equitable, thereby reducing the huge disparities existing in GLC disbursement across districts.

Strategies for increasing Farmers' Income

Farm income can be increased through increasing yield of the produce; reducing cost of cultivation and through better price realisation. Increasing productivity can be achieved through application of proper nutrients, including micro nutrients based on soil testing and soil health, adoption of appropriate crops for cultivation, proper soil and water management and adoption of integrated farming. Cost of cultivation can be reduced through collective procurement of inputs through Farmer Organisations, farm mechanization and scientific farming methods. Better price discovery through collective marketing, value addition through Farmer Producer Organisations with tie up arrangements with established market would result in improvement in farmers income. Coverage of all farmers and crops under crop insurance and livestock insurance scheme will risk proof the farmers to a great extent. Establishment of Rural Outlets for purchase and sales of produce directly by farmers to buyers will eliminate middlemen which will result in better price realisation to farmers. In order to avoid labour shortage, labour

banks may be promoted to carry out timely farm operations. Adoption of Integrated farming system coupled with livestock farming including rearing of dairy animals, sheep & goats, pigs can be taken up for supplementary income. System of storage of farm produces by farmers in WDRA accredited warehouses should be encouraged for better price for the produces.

Climate Change impact

Vulnerability to climate change can be considered to be high in state due to its unique social, economic, environmental and physical conditions that amplify susceptibility to negative impacts and contribute to low capacity to cope with and adapt to climate related hazards. It is considered that climate change alters both average temperature and precipitation patterns, which in turn influence crop yield due to decreased water availability for crop production, pest and weed infestation, changes in growing season etc. Other Climate Change impacts in crops include increased risk of extinction of already threatened crop species, reduced quantity and quality of crop produced, reduced fodder productivity, increased susceptibility to pests and diseases, shift in cropping patterns etc. Extreme events, such as floods, drought and heat waves may be among the most challenging of Climate Change for agriculture, which will result in shift in the sowing time and length of growing seasons. Seasonal precipitation and its quantity could change due to climate change. With warmer temperature, evapotranspiration rates would rise, which would call for much greater efficiency of water use. Greater risk of crop failure and already reported crop loss due to weather anomalies imposed economic loss in the state and they are likely to get far more severe as global warming continues. Crop losses were considerably high during these weather extremes.

There needs a policy framework to align human development and climate change response efforts through adaptation. Strategy to address climate change issues include : Crop Improvement and Management, Integrated Pest Management, Sustainable Land Use and Management, Promotion of Organic Farming, Developing mechanism for Integrated Management of Rainwater, Surface and Ground water, Flood control and Drought Management, Preserving Buffer Stock of Seed, Set up of Agro Processing and Cold storage centres across agro climatic regions in the state and Developing Energy Efficient Technologies and Energy Conservation in Cold Storages, Promotion of Energy Efficiency and Conservation in Agriculture practice, Extending more Crop insurance Schemes, Developing Efficient Weather Forecasting, Identifying Vulnerable agricultural regions prone to various climate change impact and declare as Special Agriculture Zones, Assistance to farmers to improve agricultural practices and diversify livelihoods.

Credit Potential for 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the potential for **ST Credit for production**, marketing and food security the year has been assessed at **Rs.47,603.65** crore.

4.1.2 WATER RESOURCES

Introduction

It is often said that agriculture sustains the society while irrigation sustains agriculture. Judicious utilization of water resources through appropriate conservation and management measures assumes critical importance in sustaining life support systems. The demand for water in Kerala is mainly for domestic use, agriculture, prevention of salt water intrusion and generation of electricity. Industrial demand is concentrated in certain areas.

Water Resources Potential of the State

Annual yield of water in a normal monsoon year in the State is about 70,300 MCM. However, the net annual groundwater availability is estimated at 5651 MCM. Nearly 40 per cent of the available resources are lost as runoff. Kerala would require around 30,000 MCM of water for agriculture, 7500 MCM for domestic use and 12,200 MCM for prevention of salt water intrusion. The pattern of demand for water is undergoing gradual but continuous change towards increasing pressure for drinking, other household and commercial needs relative to the demand for irrigation for agricultural use.

Land Use Pattern and Status of Irrigation

As against Kerala's total geographical area of 38.86 lakh ha, net sown area is 20.15 lakh ha. and gross cropped area is 25.84 lakh ha. Out of this GCA of 25.84 lakh ha, about 4.97 lakh ha is reported to be irrigated (as per Agricultural Statistics 2016-17). The gross irrigated area which has been hovering around 18 per cent is below the all India share of about 45 per cent. Source-wise details of area under irrigation for the last seven years are indicated in the Table below.

Net Area Irrigated - Source wise (in ha.)

Source	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Government canals	85825	81737	80718	80007	85654	88817	63403
Private canals	5584	1971	2457	1448	1249	774	932
Tanks	51064	47112	43558	45283	47095	48459	49657
Wells (including B.W/ T.W)	137716	137193	122338	124850	163094	168620	164504
Other sources	134824	140901	146797	145588	117190	107163	99265
Total	415013	408914	395868	397176	414282	413833	377761
Gross irrigated area	466038	490585	457896	468324	469647	483648	497386
Gross Irrigated area to gross cropped area (%)	18	18	18	18	18	18.4%	19

Source: Agricultural Statistics - Directorate of Economics & Statistics / Farm Guide

It may be noted that the share of area irrigated by wells which was hovering about 33% upto 2013-14, has increased and from 2014-15 onwards and crossed 43% level by 2016-17. Further, the share of canal irrigation has shown a sudden decline during 2016-17. Both these are matters of concern.

Stage of Ground Water Development

Kerala is dependent on ground water. The groundwater potential of Kerala is limited as 88% of the total geographical area of the State is underlain by crystalline rocks devoid of any primary porosity. An analysis of last 20 years data shows that the number of safe, semi-critical, critical and over- exploited blocks/ areas in the state remained almost same. As per the assessment report of Dynamic Ground Water Resources as on 31 March 2013, published jointly by Central Ground Water Board and State Ground Water Department, the stage of ground water development for Kerala has been assessed is 47% as against an all India average of 62% (as of year 2016). Out of 152 Blocks in the state, 131 are safe category, 18 are semi critical, two are 'critical' category (Kasargod and Malamapuzha blocks in Kasaragod and Palakkad districts respectively) and one block (Chittoor in Palakkad district) is under 'over exploited' category.

The ground level credit flow to the sector during the last 3 years (2015-16, 2016-17 and 2017-18) were Rs.532.85 crore, Rs.618.70 crore and Rs.706.40 crore respectively. Agency wise credit flow to the sector for last three years is given in Annexure II.

Issues, Constraints, opportunities & emerging trends

Minor Irrigation Not Achieving its Potential

As per Perspective Plan of Kerala, a survey to assess the performance of minor irrigation in Kerala indicated that the minor irrigation initiatives were able to achieve only a little over 53 per cent of the targeted area coverage, the actual area irrigated is only half the potential created and they support 5 lakh beneficiaries as against the proposed 7.9 lakh.

One problem with minor irrigation schemes is the number of non-functional schemes. About 16 per cent of the minor irrigation schemes are not functioning due to physical damage. Non-availability of sufficient funds for maintenance and indifference of the beneficiaries for upkeep of the structures are the main reasons for physical damages.

Economic Pricing of Water

Over the years, the State Govt. has been investing substantial amount in creation of various irrigation assets. Though the per hectare development cost of irrigation potential has increased manifold, the pricing of water has not been effected to take care of, at least, the Operation & Maintenance expenses. While States like Maharashtra, M.P, Gujarat, Karnataka, etc., have revised their water tariff, the water tariff in Kerala has remained static. It does not reflect the value of water. It is imperative that tariff for water should have correlation to its economic value.

Micro Irrigation Schemes (MIS) - way forward

MIS implemented through the drip & sprinkler irrigation techniques is highly suited for coconut, species and other horticultural crops. The benefits of MIS vis-a-vis traditional method of irrigation include: increase in crop yield (20-30%), savings of labour (30-50%), water (30-40%) & power (20-40%). Therefore, with increase in yields & associated savings, MIS is one of the most environment friendly way of increasing farm productivity. According to the International commission on irrigation & drainage, the penetration under MIS in Europe and America stood at 61.7% and 50.9%. The penetration in India stands at 9% (6 MHa under MIS out of total of 70 MHa of irrigated area). In Kerala penetration is 7% only which is below the national average.



The ‘Pradhan Mantri Krishi Sinchayee Yojana’ (PMKSY) with the motto of ‘Har Khet Ko Paani’ was introduced during 2015-16 and will be implemented up to 2019-20. There is a need for seriously considering all options of popularising all types irrigation including Micro irrigation/ water conservation and ground water recharge for achieving this goal, keeping in view the doubling of farmer’s income by 2022. The vision of PMKSY is to ensure access to the means of irrigation to all agricultural farms in the country to produce ‘per drop more crop’, thus bringing much desired rural prosperity by following a holistic approach. Preparation of comprehensive District and State Irrigation Development Plans based on agro-climatic conditions and sources of availability of water is also envisaged under the project.

Haritha Keralam Mission

Major objectives of the mission are restoring and improving the existing water resources systems, maximise the rain water harvesting and ground water recharge within each micro watershed, conservation of land and water to prevent soil erosion.

Construction of Check Dams & inter sub basin water transfer

Even though, the State receives on an average, about 3000 mm rainfall per year, due to undulating topography of the State, more than 40% is wasted as runoff without adequate recharge to ground water. This has resulted in water scarcity even for drinking during summer. In order to overcome this problem and also to sustain the existing ground water based irrigation/ drinking water structures, Irrigation Department needs to evolve suitable strategy and formulate schemes for construction of series of check dams at appropriate locations.

The viability of inter sub basin water transfer during monsoon season to rain shadow regions and thereby to augment the ground water resource of the area should be worked out as a long term solution to the water problem of Palakkad and Kasargod districts.

Participatory Irrigation Management

Management of natural resources would be successful only with the active involvement of the stakeholders. Water Users' Association (WUA), which functions on the principles of Participatory Irrigation Management, is one such institutional mechanism which will ensure equitable distribution of water resources within the community and also will bring down the operation and maintenance cost of the government. WUA is also expected to manage the irrigation structures. Such associations have performed well in States like Maharashtra and Andhra Pradesh. Realising the efficacy of these institutions, State Governments have come forward to provide financial assistance for establishment of Water Users' Associations and its operations.

Initiatives by Central Government and NABARD

Long Term Irrigation Fund (LTIF)

The Government of India during 2016-17 set up Long Term Irrigation Fund (LTIF) in NABARD with an initial corpus of Rs.20,000 crore for fast tracking of incomplete major and medium irrigation projects. An additional corpus of Rs.20,000 crore was announced for 2017-18. A total of 101 identified incomplete projects are being put on fast track from LTIF during 2016-20.

Micro Irrigation Fund

In order to achieve the national objective of enhancing water use efficiency in agriculture sector and bringing about desired growth, the Govt. of India had set up a dedicated fund in NABARD titled "Micro Irrigation Fund (MIF)" with an initial corpus of Rs.5000 crore to be utilized from the year 2017-18 onwards. Main objective of the fund is to facilitate State Governments in mobilising resources for expanding coverage of micro irrigation schemes and incentivising farmers to install micro irrigation systems for overall improvement of water use efficiency and achieving "per crop more crop".

Infrastructure Support under RIDF

Under RIDF, NABARD has extended loan support to 1857 irrigation projects in the State, till 31.3.2018. These projects with a TFO of Rs.1759 crore involve RIDF loan amount of Rs.1612 crore. On completion, these projects would benefit an area of about 2.34 lakh ha.

Suggested Action points

Government Departments

- Special emphasis on creation of suitable Artificial Recharge Structures in the districts where the water table is declining i.e, Kasargod, Malappuram, Palakkad and Kannur.
- Creation of check dams across rivers/ streams in suitable locations in midland and high range areas.
- Expeditious completion of micro level survey in critical/ over exploited blocks to facilitate credit flow
- Micro Irrigation should be encouraged by providing appropriate incentives, creating awareness about the need for water conservation and efficacy for micro irrigation.
- Formation of "Water Users Associations (WUAs)" particularly in command areas of all major/ medium irrigation projects, Lift Irrigation and under Tank Commands to ensure efficient use of water and maintenance of these structures.
- Water tariff should be revised to reflect its economic price.

Banks

- The present level Ground Level Credit for the sector is not sufficient for creation of capital formation in Agriculture by private individuals. Bank may identify the suitable farmers for providing adequate credit for the sector. Keeping in view PMKSY and doubling of farmer's income by 2022, banks may ensure providing more funds towards creation of MI structures and micro irrigation systems.

Strategies for increasing Farmers' Income

- Focus on irrigation with large budgets, with an aim of "Per Drop, More Crop".
- Micro irrigation systems like sprinkler irrigation for field crops, drip irrigation for horticulture crops may be promoted for improved water usage efficiency and also to increase production.
- Adoption of technologies like mulching, zero tillage, microbial preparations, usage of gels, etc. for retaining water in stress-sensitive crops. Propagation of water saving techniques in Schools and colleges for making the future generation more aware.

Credit Potential for 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the district wise **credit potential for the year has been aggregated at Rs.1188.42 crore.**

4.1.3 FARM MECHANIZATION

Introduction

The growing shortage of agricultural labour and rising wage rates are not the only reasons for the accelerated mechanization of farm operations. Factors such as time-saving, efficient input application, transportation of farm inputs and produce, and reducing drudgery also stimulate demand for farm machines. The development and mass production of multi-utility mechanized devices to suit the requirements of different categories of farmers are the need of the hour. Agricultural productivity is directly correlated with farm power availability. However, the energy input in Indian agriculture is still meagre compared to developed countries. Besides, over half of the power derived from mechanical and electric sources is utilized mainly for stationary operations, notably water-lifting. Only 35% of the available mechanical power is used for draught or traction in farm operations. This content needs to be stepped up substantially to raise crop output.

Farm mechanization has been abysmally low in Kerala. Even though labour availability for agricultural operations has decreased in Kerala over the years, a commensurate improvement in mechanization did not take place. On a per hectare basis, the density of

implements was found to be very low in the state. For instance, the density of use in the case of power tillers and tractors were 0.60 and 0.72 respectively. These were much lower than those for Haryana (30.3 for tractor; 4.1 for tiller), Punjab (37.8 for tractor; 4.5 for tiller), and southern states like Tamil Nadu (9.4 for tractor; 1.9 for tiller) and Karnataka (5.3 for tractor; 2.4 for tiller). The relatively smaller size of farm holdings in Kerala, decreasing area under paddy and other field crops, predominance of plantation crops, etc., could be the key reasons behind this observed pattern.

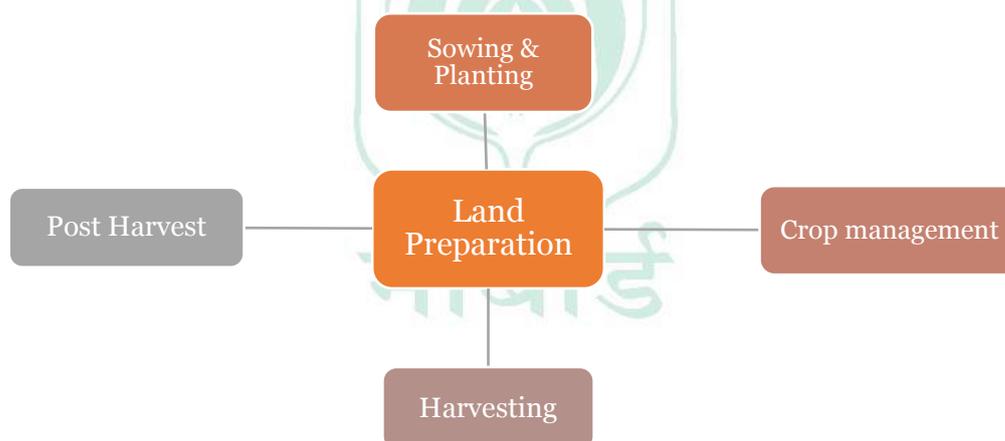
The ground level credit (GLC) flow in the State under FM sector during year 2015-16, 2016-17 and 2017-18 were Rs.877.39 crore, Rs.855.76 crore and Rs.950.41 crore respectively.

Need for farm mechanization in Kerala

The timeliness of operations has assumed greater significance in obtaining optimal yields from different crops. For instance, paddy harvesting and transportation has to take place within a very short span of time otherwise unseasonal rains can wipe out the entire effort of the farmer in one stroke. This is also correct in the case of other crops and for other farm operations like sowing, hoeing, irrigation, and marketing. Secondly, the quality and precision of the operations are equally significant for realizing higher yields. The various operations such as land leveling, irrigation, sowing and planting, use of fertilizers, plant protection, harvesting and threshing need a high degree of precision to increase the efficiency of the inputs and reduce the losses.

Issues, Constraints, opportunities & emerging trends

i. *Going beyond Land preparation*



The mechanization is skewed towards land preparation. There is need to introduce complete crop specific machination solution.

ii. Rice cultivation in Kerala requires very high labour input, as much as 1000-1200 man-hours per ha in the State compared to only 800 man-hours per ha in other States in India. At present, tillage operations in rice cultivation and harvesting are mechanized to a great extent with the help of tractors, power tillers and combine harvesters. Use of transplanters are also gaining momentum in the recent past. However, other labour-intensive operations such as weeding are performed manually. Commercial rice-farming machines like vertical conveyor reaper are yet to be adopted widely in the farms of the State mainly due to their high investment cost and sophisticated technology for operation and maintenance.

iii. Popularization of Kerala specific farm machinery: Considering the average small land holding (0.22 ha) it is important that small farm friendly equipment needs to be custom made to fit to the requirements of Kerala.

Increasing adoption of coconut climbers can make a big difference in the harvesting operation of nuts. It can minimize time for coconut harvesting and at the same time reduce labour requirements and also reduce cost of harvesting. Similarly, there are several other small-farm friendly implements, like power operated levellers, ridgers, puddlers, harrows, furrow-bund formers, seed and fertilizer drills, planters, weeders, shellers, harvesters, etc., that are suitable for agriculture in Kerala, but are yet to find significant levels of adoption.

Introduction of credit linked back ended subsidy schemes for purchase of small farm implements, and for replacement of inefficient pumpsets by energy efficient pumpsets can encourage the adoption of such machinery.

iv. Customization of farm machinery for Plantation sector: Kerala has a substantial share in the four plantation crops of rubber, tea, coffee, and cardamom. These four crops together occupy 7.05 lakh ha, accounting for 35 percent of the net cropped area in the state. There is an acute shortage of labour which needs to be addressed.

v. Gender-friendly tools and equipment: High level of participation of women in agriculture in the state both in production and processing calls for - Ergonomically designed tools & equipment for reduced drudgery, enhanced safety & comfort.

vi. Promoting 'Custom Hiring Centers': Mechanization is all about scales of operation. If scalability is lacking farm mechanization will not be economically viable, this calls for promoting 'Custom hiring centers' rather than distributing 'Tractors' / Combined Harvesters at high top up subsidy. Agro Service centres promoted by GoK are offering good services to farmers.

vii. Quality certification: Lot of innovation, customization of farm machinery is happening in SME sector in the state there is a need for ensuring quality control of newly developed agricultural machinery through performance evaluation of newly developed agricultural machinery and equipment and certifying them at designated testing centres located all over the country.

Suggested Action Points

Banks should finance second-hand agricultural vehicles including tractors. Considering the large population of tractors and tillers in the state, a good market for financing second-hand tractors for agricultural use still remains untapped.

Monetary incentives like subsidy for promotion of small farm friendly farm implements and replacement of pumpsets are available under Central/ State schemes of submission of Agricultural Mechanisation (SMAM). Bankers have to encourage financing of farm equipment's leveraging subsidy and other incentives available. While fragmented holdings pose a problem for

SUB-MISSION ON AGRICULTURAL MECHANIZATION

Agricultural land area in the world has limit, but the demand for food is ever increasing due to population growth. To increase productivity in the limited land so as to meet the expanding demand arising from population growth, especially in countries like India, precise and planned interventions are required in the Agriculture sector. One of the most important input for increasing agriculture productivity is mechanisation of farm sector. In India, the national average of farm power availability is 2.02kW/ha and most states, with the exception of Punjab, Haryana, parts of UP & Rajasthan, especially in Eastern and North-East Regions, has significantly lower farm power availability. Keeping this in view, Government of India is implementing "Sub Mission on Agricultural Mechanization (SMAM)" with the objective of promoting the usage of farm mechanization in all the states and increasing the ratio of farm power to cultivable unit area up to 2.5 kW/ha.

The Mission has eight components, viz., Promotion and Strengthening of Agricultural Mechanization through Training, Testing and Demonstration, Demonstration, Training and Distribution of Post-Harvest Technology and Management (PHTM), Financial Assistance for Procurement of Agriculture Machinery and Equipment, Establish Farm Machinery Banks for Custom Hiring, Establish Hi-Tech, High Productive Equipment Hub for Custom Hiring, Promotion of Farm Mechanisation in Selected Villages, Financial Assistance for Promotion of Mechanized Operations/hectare Carried out Through Custom Hiring Centres, Promotion of Farm Machinery and Equipment in North-Eastern Region.

investments in mechanisation, the new models like Food Security Army promoted by Kerala Agricultural University are new hopes in the horizon.

Strategy for increasing Farmers' Income

Collective custom hiring of farm machinery reduces cost of cultivation. This would increase the profit margin available to farmers.

Credit Potential for 2019-20

Considering the infrastructure available, likely to be made available and discussions with the line departments, etc., the **credit potential assessed for the year 2019-20 in Farm Mechanisation is Rs.1050.94 crore.**

4.1.4 PLANTATION AND HORTICULTURE

Introduction

Kerala produces about 89.51 M.MT of horticulture produce from an area of about 13.87 m. ha. and accounts for 3.22% of the total horticulture production in the country. Kerala stands first in production under plantation crops with an output of 5347.87 MT (provisional) during 2016-17 contributing to 32% of the total share of the country's production.



Plantation and Horticulture crops have a major stake in Kerala's economy as around 90 percent of the net cropped area is under these crops. Kerala has a substantial share in four plantation crops of rubber, tea, coffee and cardamom. These four crops together occupy 7.04 lakh ha, accounting for 27.29 percent of the gross cropped area in the

State. Kerala accounts for 5.03 percent of the area and 6.3 percent of the total domestic production of tea in the country. In 2016-17, the tea production increased by 3607 tones despite area remaining the same showing increase in productivity.

Plantation and Horticulture (P&H) sector is the back bone of Kerala Agriculture, which provide livelihood to majority of the population as also provides employment to several thousand common people. The sector also contributes to the State and Central exchequer by way of taxes.

Coconut occupies the highest area (7,81,496 ha) among all other crops in Kerala. It accounts for the largest share in the Gross cropped area followed by rubber and paddy. However, on account of low productivity (6,883 nuts per hectare), Kerala's share in the area as well as production of coconut in the country is declining over the years.

Kerala is the home of Indian rubber and 90% of the farmers are small holders. The area under rubber as on 31.03.2017 is 551050 ha which constitutes 21% of the cropped area and the area has been increasing in the recent years.

Spices condiments that include pepper, cardamom, turmeric, ginger, cinnamon, clove, vanilla, nutmeg, etc., claim a share of 14 per cent. Banana and other fruits together constitute an area share of 11 per cent.

The marginal and fragmented land holding pattern, homestead farming practices have resulted in high cropping intensity. The dependence on world market conditions makes the sector highly vulnerable to volatile price movements of the commodities.

The expectation of substantial benefits to the Kerala economy from expanded trade resulting from globalization of agriculture has not materialized. At the same time disturbing impact of import of items such pepper, palm oil, soyabean and rubber which compete with local produce is being felt.

The latest developments in the negotiations of WTO with the objective to lower trade barriers around the world facilitating increased global trade will pose a major challenge for this sector.

Area, Production and Productivity of major crops

Sl. No.	Crops	Area (Ha.)		Production (MT)		Productivity(Kg./Ha.)	
		2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
1	Pepper	85948	85207	42132	34065	490	400
2	Ginger	4986	5151	22044	20478	4421	3979
3	Cardamom	39730	39080	19500	17147	491	439
4	Areca nut	99126	97696	132453	116839	1336	1196
5	Banana	59835	57158	536155	489322	8961	8561
6	Other Plantains	57863	57138	411626	395806	7136	6927
7	Cashew nut	43090	41661	24733	27944	574	671
8	Tapioca	69405	68664	2662610	2662610	38363	38363
9	Coconut *	790233	781496	5873	5379	7432	6883
10	Coffee	84987	84976	69230	63476	815	747
11	Tea	30205	30205	57898	61505	1917	2036
12	Rubber	550840	551050	438630	540400	796	981
13	Jack *	92969	91982	285	281	3066	3055

* Production in Million Nuts, Productivity in numbers. Source; Economic Review -2017, Farm Guide-2019

The ground level credit flow to the sector during last 3 years (2015-16, 2016-17 and 2017-18) were Rs.1925.28 crore, Rs.1985.87 crore and Rs.3290.58 crore respectively

Strengths of the sector

- Resource support from dedicated Commodity Boards (Spices, Rubber, Coconut Development Boards – All have their Head Quarters in Kerala; Tea Board, Coffee Board have their networks)
- Support from agricultural research establishments of the State and Central Govt. (CPCRI, IISR, CTCRI, KAU and KVKs).
- Collective farming through Kudumbashree.
- Scope for organic farming and cultivation of medicinal plants as many farms are relatively free from harmful inorganic residues.
- Conducive for maximum biomass production per unit area, because of favourable climate.
- The inheritance of sustainable land use, cropping systems and integrated farming – known as homestead farming.
- A proactive State Horticulture Mission.
- Extensive network of Commodity traders in all villages, making marketing easy for even small farmers.

Issues, Constraints, opportunities & emerging trends

- I. **Price volatility:** The price of all major plantation and spices were fluctuating during the past three years. Further, impact of climate changes, labour shortage, high input cost etc., were some of the adverse features affecting the sector. GoK and commodity

boards may formulate price support schemes to incentivise farmers when market prices are below economic threshold.

- ii. **Fruits:** Growing incomes, changing lifestyles has created positive vibes for traditional Kerala fruits, the processing and marketing challenges remains to be addressed. There is a need for public-private partnership model to plug the glaring loopholes in the entire value chain. The potential in respect of jack fruit, local variety of banana and exotic fruits like Rambutan have not been fully tapped.
- iii. **Coconut:** Though it is one of the principal crops, the States share in area and production is declining over time, the share being 40.2% of area and 42.12% of the production.
- iv. Productivity continued to decline, mainly on account of root wilt disease, poor management and existence of senile and unproductive palms. The attempt made by the Department of Agriculture and Farmers' Welfare to restructure two coconut development programmes through convergence approach at the Panchayat level during 2014-15 coupled with price advantage is expected to revive coconut production in the state. Further, attempts of production of dwarf coconut seedlings and hybrids need to be scaled up with the support of R & D institutions.
- v. A value chain approach to the sector as a whole concentrating on product diversification is the need of the hour – Neera, coconut sugar, jaggery, desiccated coconut, activated charcoal are some of the potential products.
- vi. The Producer Companies established with support from NABARD / Coconut Board / others are expected to take up various activities related to product diversification in the sector. The support of other stakeholders like Financial Institutions, Government is very crucial to scale up this initiative.
- vii. **Plantation Crops:** Nearly 14 lakh families are dependent on Plantation sector for their livelihood. The plant population in most of the estates has even crossed its biological life span. Replantation must be encouraged with soft loans, tax concessions and technology upgradation for the purposes like replanting, water conservation and value added products.
- viii. **Rubber:** The crash in price to almost one third of the previous peak price has put the planters across the rubber belt in dire straits and they are clamouring for relief to sustain their plantations. The industry is facing multiple challenges not only on the price front but also due to increase in the cost of production, shortage of skilled labourers especially tappers. In addition, there is a sharp fall in productivity. The yield (Kg/ ha.) which was 1481 in 2012-13 declined to 796 kg in 2015-16, and in 2016-17 has increased to 981 kg. Presently the farmers are going in for inter cropping in rubber gardens, like planting of pepper vines and pineapple, etc in their gardens.
- ix. **Spices, cardamom, pepper:** Kerala is considered as “**Spice Bowl**” of India and the export of raw spices from Kerala is known from age old days. In case of Pepper, though the prices almost doubled, the crop reported fall in productivity (from 547 kg/ha in 2012-13 to 400 kg/ha in 2016-17), However, the value addition of the products is not to the desired level.
- x. **Cashew:** The area under cashew in Kerala is showing declining trend (70,463 ha during 2006 has declined to 41,661 ha. in 2017). There is an urgent need to the



- improve production and productivity of cashew by resorting to replanting of old senile plantations with improved varieties such as Dhana, Priyanka, etc.
- xii. **Organic Agriculture** - The focus has shifted from “self-sufficiency” in vegetables to Safe-to-eat vegetables. The focus of the Agriculture Department is now on using Good Agriculture Practices (GAP) using permitted insecticides. It is planned to cover atleast 50,000 ha under vegetables with GAP, besides promoting organic vegetables through VFPCCK.
- xiii. **Cool Season Vegetables:** The climatic conditions prevailing in Wayanad, Idukki, and other hilly tracts are very conducive for cultivation of cool season vegetables such as Capsicum, Broccoli, Baby Corn, Litchi, Summer Squash, Lettuce, Celery etc. There is a demand for these vegetables for domestic use as also for export. However, the lack of appropriate infrastructure both in terms of physical and financial has hampered the growth of the sector.
- xiv. **Scheme for poly-house cultivation:** State Government has introduced a credit linked subsidy scheme for poly house cultivation. Under the scheme, a subsidy of 75% will be given to a polyhouse unit covering a 400 sq m area. Centre will give 50% subsidy, 25% by the state. 1095 polyhouse were established during 12th FYP in the state. One of the drawbacks of the poly house method of cultivation is that only self - pollinated varieties can be grown because the plants are insulated from insects. This effectively confines the utility of the greenhouse to the production of certain high value crops like tomato, salad cucumber, capsicum, and cowpea which have limited market demand. The issues like marketing and technical support need to be addressed for the development of high tech farming in the state.
- xv. **Collective farming through Kudumbashree:** The major crops cultivated are paddy, vegetables, banana, pineapple and tubers. More handholding support, including marketing arrangements is required for improving the livelihood and also for enhancing the production of these crops in the state.
- xvi. **A new concept of Special Agricultural Development Zone (SAZ)** was introduced during 2017-18 for convergence based result oriented scheme preparation and implementation for focused project based interventions in identified potential zones.

Suggested Action Points

- a) One of the problems with the Coconut sector is the “height” of the tree. A programme on mission mode for planting dwarf varieties may be taken up. 99% of Kerala’s coconut trees are of tall variety (40 ft.), making harvesting unviable due to acute shortage of climbers. The promotion of dwarf varieties would bring down the reliance on climbers.
- b) The use of innovative technology assisted climbers developed by various universities and research institutions could be promoted more aggressively.
- c) Model schemes in Plantation and Horticulture sector have been prepared by NABARD and are available in website www.nabard.org. Banks may adopt the same with suitable modifications to suit local conditions.
- d) The potential of coconut water as a beverage, in addition to Neera needs to be tapped.
- e) The Coconut producer companies established by the NABARD and CDBs should be nurtured, hand held and should be made a tool through which value chain interventions and product diversification should be attempted.
- f) Natural Rubber industry is passing through a tough time. There is an urgent need for the policy makers to work closely to find solutions to the problems being faced by the sector. The price of natural rubber, which is vulnerable to international prices needs to be stabilized by appropriate policy measures at the Central Government level. As regards the increase in production cost and labour cost, the Rubber Board, Govt.of Kerala and the farmers should work together to find a solution.

- g) Value addition at the primary producer level enables value retention leading to increased income at the hands of the producers. This aspect needs to be worked on. Value chain interventions through various models of aggregation, processing and marketing needs to be encouraged in the sector by provision of appropriate monetary and non-monetary incentives.
- h) Setting up of sector specific labour bank like that of trained coconut climbers created by CDB may be attempted by other Boards also. The guidelines on MNREGA could be leveraged for the purpose by the LSGIs.

Strategies for increasing Farmer' Income

- Plantation crops take longer duration for yielding revenue. Hence, farmers should go in for intercropping of lesser water intensive crops to sustain and earn additional income.
- By adopting sprinkler and drip irrigation, minimum use and judicious use of water instead of water logging, productivity can be increased and thereby income.
- Region specific scientific and ideal multi-tier or intercropping systems for horticulture crops to be standardized and adopted.
- Aggregation of produce on a village/cluster basis with minimal processing wherever required and association of FPOs functioning in the respective area.
- Promotion of beekeeping with major focus on increasing pollination and crop production and honey bee based by product.

Climate Change impact

Drought is the major constraint for the crop productivity, more so in plantation crops since they are widely grown in different soil types such as sandy, sandy loam, laterite and forest soils in the state. As these crops are mainly grown under the rain fed condition, productivity is affected due to the dry summer. During the dry period, soil water deficit coupled with changes in atmospheric parameters aggravate the situation leading to soil as well as atmospheric drought.

Strategy to address climate change issues include : Crop Improvement and Management, Integrated Pest Management, Sustainable Land Use and Management, Promotion of Organic Farming, Developing mechanism for Integrated Management of Rainwater, Surface and Ground water, Flood control and Drought Management, Set up of Agro Processing and Cold storage centres across agro climactic regions in the state and Developing Energy Efficient Technologies and Energy Conservation in Cold Storages, Promotion of Energy Efficiency and Conservation in Agriculture practice, Extending more Crop insurance Schemes, Developing Efficient Weather Forecasting, Identifying Vulnerable agricultural regions prone to various climate change impact and declare as Special Agriculture Zones, Assistance to farmers to improve agricultural practices and diversify livelihoods.

Credit Potential for 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the district wise credit **potential assessed for the year has been assessed at Rs.5,800.10 crore.**

4.1.5 FORESTRY & WASTELAND DEVELOPMENT

Introduction

Kerala has been blessed with a very good forest cover. As per the State of Forest report 2015, the forest cover is 19,239 sq. km constituting 49.5% of geographical area of the

State showing an increase of 1,317 sq.km over 2013, this is mainly due to increase in commercial plantations. All lands, more than one hectare in area with a tree canopy density of more than 10 per cent is included as forest cover in Forest survey. The forest area as recorded in Government record is 10815 sq. km. There has been an increase of 622 sq km in the forest cover compared to 2011 survey.

Forests in Kerala form part of one of the 32 biodiversity hotspots in the World. The forests in Kerala cover two bio-geographic zones of Western Ghats and the West Coast and vital for environmental protection, besides acting as repository of numerous, diversified, rare and endangered flora & fauna. 51% of the total state forest cover is in the southern districts and the remaining 49% is in the central and northern regions. Idukki, Palakkad, Pathanamthitta and Wayanad districts have the largest area under forest cover.

The forest area in Kerala has rich bio-diversity and is native for many species. There are about 550 species utilized as Non wood Forest products and valuable species like teak (75,767 ha; 43.8%), eucalyptus (14,274 ha; 8.3%), Bamboo & reeds (5,912 ha; 3.4%), Sandal wood (3439 ha), minor forest produce & fire wood. The share of plantations is 37% of the total area under forests.

As water scarcity becomes more and more acute and climate-change-related extreme events become more frequent, the role of biodiversity management will help to reduce long term economic and ecological vulnerabilities, ensuring that the unique plant and animal wealth are sustainably managed for the economic development of the State.

Under Forest Management policy, space was created for involvement of local communities in the conservation, protection and management of forests through Joint Forest Management (JFM) institutions. In Kerala, Vana Samrakshana Samithis (VSS) at the village level undertake the role of JFM.



Farm forestry

About 65 per cent of the requirement of timber and nearly half that of fuel wood in the country is met through farm forestry. Going by projections made by the Jhansi-based National Research Centre for Agroforestry (NRCAF), science-based farm forestry can make the country nearly self-sufficient in timber. That would, obviously, obviate the need for timber imports, which currently averages about six million cubic metres every year. Besides, it can sharply reduce the dependence on forests for fuel wood.

A carefully chosen combination of trees, shrubs and crops in agroforestry can help address the paucity of green fodder. Notably, a sizeable part of the biofuel requirement, too, can be satisfied by including suitable biofuel-producing trees in farm forestry, fruits, oilseeds and a host of other useful commodities can be produced through such ventures to improve nutrition and farm incomes. The employment generation capacity of agroforestry is estimated at 450 man-days per hectare, per year.

Kerala has favorable agro climatic conditions for farm forestry. Farmers have been traditionally growing tree for timber in their homesteads. The prevailing stringent policies and regulations relating to felling and transporting farm-grown timber and other products were hindering the growth of the sector. This is set to change as the new guidelines, issued on July 11, 2014 by GOI allow farmers and other tree growers to dispose and transport short-rotation timber species grown on their own property and not available in neighboring forests, with permission from village-level bodies. The Kerala

government has allowed felling of 30 species of trees in the private farm land without any permission. It is expected to give a big boost to the sector.

The ground level disbursement to the activities like Social forestry, Farm forestry, Wasteland Development, Forestry-misc., during 2015-16, 2016-17 and 2017-18 was Rs.41.87 crore, Rs.43.78 crore and Rs.32.07 crore, respectively.

Potential activities, emerging areas / activity

Forest based industries: Major wood based industries are saw milling, packing case, plywood, splints and veneers, pulp and paper etc. Of the 2,214 registered units in Kerala, more than 93% are small sized employing less than 10 workers. Even though there is stagnation in their activities, the recent relaxation in felling of trees from homesteads has opened for more agroforestry options in the State. The plantations, home gardens and estates form the major source of wood supply in the State.

Bamboo Sector: As per the 2013 figures Bamboo is spread over 5,912 ha under forest area. There exists immense scope for bamboo cultivation under farm forestry in private and government lands. Through indigenous population/ resource poor tribal, there is scope for undertaking bamboo plantations in the forest area too. With technical inputs and skill upgradation, the local communities may be encouraged to set-up units of various bamboo products.

National Afforestation Programme: The National Afforestation Programme funded by Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India has facilitated expansion of participatory forest management through forest development agencies, which are formed by federating Vana Samrakshana Samithies /Eco Development Committees (VSSs/EDCs).

Green India Mission: The Green India Mission aims to address key concerns related to climate change in the Forest Sector viz., Adaptation, Mitigation, Vulnerability and Ecosystem services. To this end the Mission also aims to take a broader landscape approach to address the drivers of forest degradation while supporting communities to meet their basic necessities of fodder, fuel- wood and livelihood. The general body and executive committees of the State Forest Development Agency (SFDA) has discussed the preparation of perspective plan in its meetings and has proposed the perspective plan to be implemented in the landscapes. 24 Forest Development Agencies (FDAs) are coming under these identified landscapes. Micro planning with the active involvement of local grama panchayats, NGOs and other development departments including Agriculture, Soil Conservation and Animal Husbandry have taken place at Joint Forest Management Committee (JFMC) and FDA.

The objectives of the plan are to address the environmental issues, improve quality of the forests, conservation of endangered and endemic species, to improve the tree cover, improve soil and moisture condition, improve livelihood by providing more employment to the dependent communities, reduce dependency over forests, conserve the ecosystem, conserve mangroves and sacred groves, combine activities of social forestry and agroforestry, increase forest cover in urban and semi-urban areas. The major activities proposed under Green India Mission include preparation of village level micro plan, capacity building programme of Vana Samrakshana Samithi/ Eco Development Committee (VSS/EDC), Soil & moisture conservation, Fire protection activities, Rehabilitation of shifting cultivation areas, restoration of mangroves, Bio-fencing, planting of Non-Timber Forest Product (NTFP) species etc.

Suggested Action Points

Increase productivity through improved management of resources

Bio technology has the potential to improve the quality and quantity of wooden raw material supplies in a long term perspective and could also have a radical effect on pulping processes, waste to energy systems and other aspect of manufacture and use of forest products. This would also help to reduce cost and at the same increase the yield.

Diversify sources of wood

The demand for wood substitutes like Medium density fibre board (MDF), particle board, and engineered lumber, fabricated structural building components is a huge opportunity. While, substitutes to wood have their limits as far as the practical application are concerned newer sources of wood may be promoted. Rubber wood is to be seen as a reasonable alternative material for wood. With the expansion of area under rubber, there is need to promote market of rubber wood and promote its usage through R& D, marketing and branding. Similarly, bamboo as another source of wood needs a major push to R &D and marketing.

Create new products

Forests offer enormous potential to produce a bio-energy, bio-chemical products like agro chemicals, cosmetics, pharmaceuticals, food additives, fragrances, industrial chemicals and petrochemicals fuel.

Sustainable forest Management

While promoting of forest based industries, the focus on the sustainability of such initiative should not be lost sight off. The community based model of VSS makes the task of sustainable forest management more sustainable. However, VSS as an institutional infrastructure needs revamping, as its status as a legal entity is still not very certain. This needs to be addressed. Further the activities of VSS should be strengthened by involving the members of VSS in all the activities relating to forest management.

Strategy for increasing Farm Income

Farmers may also take up apiculture in addition to agro forestry for supplementary income.

Climate Change impact

Many of the impacts of climate change on forests and other natural ecosystems such as loss of biodiversity could be irreversible. Kerala Forest and Wild life Department has the broad mandate of conserving and expanding unique and complex natural forest of Kerala for posterity, in particular with regard to water, biodiversity, productivity, soil, environmental, historical, and cultural and aesthetic values without affecting their ecological processes.

Credit Potential for 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the district wise **credit potential assessed for the year has been assessed at Rs.213.06 crore.**

4.1.6 ANIMAL HUSBANDRY – DAIRY DEVELOPMENT

Introduction

Livestock is an important element of the livelihoods of rural households and considerable efforts of the Government of Kerala at economic development have focused on this sector. During 2016-17, Kerala contributed only 1.50 per cent of the annual milk production of the country. Nationally Kerala ranks 14th in Milk production with a production of 25.20 lakhs MT milk during 2016-17. However, the sector has high potential for alleviating poverty and upliftment of the rural economy.

The ground level credit flow to the sector during last 3 years (2015-16, 2016-17 and 2017-18) were Rs.1,179.04 crore, Rs.2,148.18 crore and Rs.1,332.77 respectively. Agency wise credit flow to the sector for 3 years is given in Annexure II.

Strengths of the sector

- a) Kerala ranks 14th with 25.20 lakh MT in 2016-17. The per capita availability of milk in Kerala is 189 gms per day as compared to national level availability at around 352 grams per day during 2016-17, which is more than the world average.
- b) As per the livestock census, 2012, total livestock population in Kerala is 2.73 million, of which cattle population contributes around 50%.
- c) Kerala is the only state in the country having a structured, operational, self-sustainable breeding policy for cross breeding of animals.
- d) The percentage share of exotic/crossbred cattle is depicting an increasing trend, whereas the percentage share of indigenous cattle is decreasing. State has 12.51 lakh crossbred cattle and 0.77 lakh indigenous cattle (*Source: Livestock census, 2012*).
- e) The exotic/crossbred cattle contribute highest with 55.08% animals in milk in the state and indigenous contributes to 2.45%.
- f) Total milk production in the State during 2016-17 stood at 25.20 lakh MT as compared to a production of 26.49 lakh MT during 2015-16, thus registering a negative annual growth rate of -0.05% (*source: ER,2017*).
- g) Existence of good network of Artificial Insemination Centres, cattle breeding centres, disease control and diagnostic Centres, feed testing labs, veterinary clinics and dispensaries.
- h) Separate Dairy Development Department with a network of affiliated institutions – 152 dairy extension service units, 5 dairy extension centres, 14 quality control units and 2 fodder units
- i) One Artificial Insemination Center per 291 breedable cattle as against the NCA norm of one Artificial Insemination Center per 1000 breed able females.
- j) Availability of highly trained and qualified technical manpower.
- k) Establishment of large number of commercial and hi-tech dairy farms by new generation entrepreneurs as a source livelihood.

Constraints, opportunities & emerging trends

- i) **Lack of proper value chain:** It is estimated that about 7 lakhs dairy farmers working under this sector. But only 15 to 16% of milk is collected from 3 lakhs farmers through dairy co-operative Societies in Kerala, and the rest is handled by this unorganised dairy farmers
- ii) **Non-availability of quality milch animals:** Inadequate availability of good quality milch animals, locally, leading to import of animals from neighboring States whose quality cannot be checked / verified by existing institutional mechanisms. Inadequate attention / thrust to heifer calf development is another reason for shortage in availability of milch animals.
- iii) **High cost of maintenance:** The cross-bred cattle have higher overall maintenance cost. Their fodder and feed requirement, adaptability to local ways

of keeping farm animals and susceptibility to common diseases and parasites is higher.

- iv) **Shortage of Green & Dry Fodder:** The State produces only around 60% of its total fodder requirement. Shortage of green and dry fodder is a major issue in the State hindering the productivity of milk.
- v) **Other Contingencies:** Threat of foot and mouth disease is a major contingency because of large-scale inflow of cattle from the adjoining states.

Suggestions / Strategies for consideration

- a) **Credit Support to Dairy Farmers:** Dairy farming is an agricultural based activity where very poor farmers are involved. The Government and the Bankers usually give priority for agriculture and sanction agricultural gold loan and crop loans at lower interest rates between 3% to 8%. Dairying should also be included as a priority sector in this regard.
- b) Banks to encourage setting up of primary milk processing units, taking advantage of subsidy under DEEDS.
- c) Model schemes in dairy sector have been prepared by NABARD and are available in website www.nabard.org. Banks may adopt the same with suitable modifications to suit local conditions.
- d) Non-availability of good quality milch animals is one of the major constraints faced by the dairy development sector in the state. Cattle breeding farms in each Districts in the Govt/cooperative sector may be set up to take care of the problem. Promotion of good local breeds would help to reduce the overall cost as they are ecologically and fiscally sustainable in the long run
- e) Possibility exists for Area Based Schemes in Dairy in the identified blocks with support of AH/Dairy Dept. and financing banks.
- f) Strengthen veterinary services and upkeep of animals through on location service and improve the services available with the veterinary hospitals. 24 Hour mobile veterinary hospitals can be introduced.
- g) Encourage Dairy co-operatives to take up value chain activities including fodder cultivations, extension services and input supply centres.
- h) Cultivation of high yielding fodder as intercrop in coconut and rubber plantations through JLGs/ NHGs shall be encouraged with marketing & price support. Also the available cultivable and unutilized land with the State and Local self-government should be utilized for fodder cultivation as intercrop by individual farmers /self-help group.
- i) Simplified pollution clearance norms with transparent grading mechanism to be evolved based on size of the unit and location.
- j) Government to promote dairy parks on the model of industrial / food parks with all the required backward/ forward linkage.

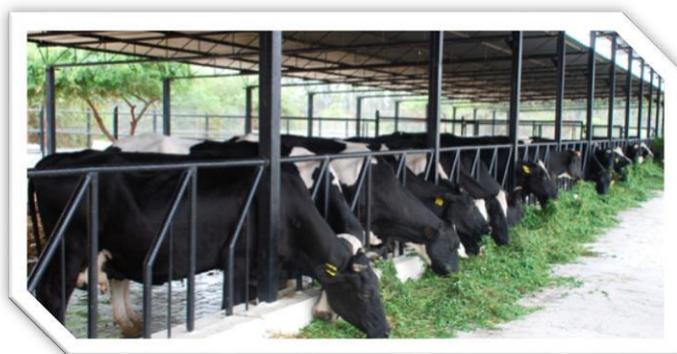
Strategies for increasing farmer's income

- In addition to dairy farming, small and marginal farmers may be encouraged to take up rearing of small poultry units, sheep, goats, pigs, etc., as a source of supplementary income and improve their economic conditions.
- Supply of bio manure as an additional activity through vermi composting within the available land holding to be encouraged as a supplementary income.
- Organised method for collection and storage of cow urine for making Jeevamrutham, an effective ingredient in organic and safe to eat method of farming would be additional income.
- Similarly, marketing of cow dung as organic manure in an organized set up will provide an additional income to the dairy farmers.

Climate Change impact

Productivity of animals is being affected due to heat stress, new diseases and change in pattern of existing diseases observed, large numbers of animals may become unproductive. Higher temperatures and changing rainfall patterns can enhance the

spread of existing vector borne diseases and macro parasites, accompanied by the emergence of new livestock diseases. Temperature and humidity variations could also have a significant association with bacterial, viral and increased helminth infections, protozoan diseases such as Trypanosomiasis and Babesiasis. Some of the viral diseases may also reappear affecting small ruminant population as well. Frequency of incidences of mastitis and foot diseases among crossbred cows and other animals with high productivity may increase due to increase in the number of stressful days. It is found that the farmers will get a set back by decreased production of milk the coming years especially during the summer period. The production reduction will be atleast 10% less of the expected quantity of production of milk and in this way the sector will be suffering a loss of atleast 30 crores.



Strategy to address climate change issues include : Research on the new and emerging diseases due to climate change, Renovation of cattle sheds based on environmental parameters, Sustainable Livelihood Approach to the Farmers, Focused research on Cross breeding to adapt to climate change, Improved Feed and fodder Development, Research on Native species

breeding and rearing etc.

Floods in August 2018: The recent floods in State have severely impacted the Animal Husbandry Sector. Several milch cows, goats, poultry birds and other animals were washed away. The livestock and other farms including cattle sheds were decimated and the livelihoods of hundreds of livestock farmers destroyed. As per preliminary reports it is estimated that the sector has suffered a loss of around ₹ 400 crore while milk production has reduced to half. The Department of Animal Husbandry has estimated that around 10,000 cattle died in the flood-affected districts. Around 12,000 goats and seven lakh poultry are also estimated to have perished. Prolonged exposure to water had led to skin lesions and other animal diseases. There is a severe shortage of cattle/ poultry feed, green and dry fodder in the flood affected areas.

The Department of AH may continue their efforts (i) to assess the real damage caused to livestock, cattle/ poultry sheds, equipment, veterinary infrastructure, feed mixing plants, milk collection centers, semen production centres, green fodder production farms, dry fodder, milk/ meat processing units, retail shops marketing milk, eggs and meet etc., during the floods (ii) to ensure the supply of cattle feed, green/dry fodder, mineral mixture etc., on a more sustained basis to protect the affected livestock (iii) to organize special veterinary camps in the flood affected areas and provide veterinary aid facilities to treat animals and birds with special focus on milch animals. State Government may make arrangements to stock adequate quantities of cattle feed, green and dry fodder, vaccines and medicines to protect the sector. The focus should be on supplying cattle feed, green and dry fodder at the micro level. The Dairy Development Department along with Dairy Cooperatives should take timely measures to maintain supplies. The Department may prepare a plan of action keeping in view of the loses caused to the sector by pooling available financial resources to restore the lost growth impulse of the sector by kick-starting entrepreneurship. Any investment in this sector at this juncture would not be too high, since it could have a multiplier effect on the local economy.

Credit Potential for 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the total **credit potential for the state assessed for the year 2019-20 is Rs.3,005.40 crore**. The District wise credit potential is given in Annexure I.

4.1.7 ANIMAL HUSBANDRY – POULTRY DEVELOPMENT

Introduction

India's poultry sector has transformed from a backyard activity into a technology-intensive vibrant industry. This metamorphosis is unique in some respects. A notable feature is its total self-reliance in technology generation as well as the production of needed equipment and inputs. Significantly, both the public and private sectors have contributed to this progress.

Unlike dairying, where the bulk of growth has been in the unorganised sector, comprising small milk producers owning four or five cattle or buffaloes each, the poultry revolution is driven chiefly by the organised sector poultry farming. Over 70 per cent of the country's poultry output comes from the organised sector.

Kerala ranks 8th among States in poultry production and is the 7th largest meat producing State in the country. Out of the total meat produced, 40.26 per cent is poultry meat. Kerala consumes about 2.4 lakh tonnes of poultry meat every year. This alone makes for a market of ₹3360 crore in size. Internal production is just 90,000 tonnes, which necessitates the dependence on outside sources. The market for eggs is estimated to be about ₹1800 crore. Poultry meat and eggs make for a massive annual demand of ₹5400 crore. Lion share of this is going outside the State.

Duck farming is the traditional ancillary occupation for rice farmers in the Kuttanad region. Once the harvest is over, ducks are flocked to the fields to feed on the leftovers. The cost of rearing them is low as the ducks mostly fend for themselves.

As per the 19th Quinquennial census 2012, the total poultry population in Kerala is showing an increasing trend over 2003-12. The birds have increased from 12.21 million numbers in 2003 to 24.28 million numbers in 2012. There is an increase of 54.8% in the poultry population over the previous census. The ground level credit flow to the sector is also showing an upward trend.

The credit flow during 2015-16, 2016-17 and 2017-18 were Rs.371.58 crore Rs.437.67 crore and Rs.304.90 crore respectively.

Strengths of the sector

- a) 90% of the population follows a non-vegetarian diet, perennial demand exists.
- b) Climate is moderate and suitable for the avocation.
- c) The traditional duck farming model has inherent cost advantages
- d) JLG's with active backward integration taking up the activity

Issues, Constraints, opportunities & emerging trends

- **Availability of good breeds:** There is a heavy demand for improved backyard chicken varieties among the farmers. As these birds are improved varieties, the character broodiness has been virtually lost, replacement stocks are to be made available continuously from the public sector units.
- **Availability of feed:** The improved backyard chicken varieties could not sustain only on scavenging. There is a need for the provision of small quantity (30g) of compounded layer feed for good performance. Making the feed available in the rural areas in small packs of 5 or 10 kgs is essential.

- **Veterinary and health services:** Non-availability of veterinary aid and skilled workforce for vaccination at the village level result in the devastation of the flock by diseases mainly by New Castle disease. It is therefore essential that improved veterinary services with disease prevention programmes are to be put in place for better results.
- **Predators:** Predation is found to be the highly devastating factor to the village poultry. As the chick stage is most vulnerable, initial growing in the nurseries before distribution can to some extent solve this problem.
- **Limited Scavenging area:** Small and marginal farmers are the main growers of backyard chicken, therefore, scavenging area is found to be the limiting factor.
- **Resistance from the neighbours:** This is another factor which determines the flock size in village conditions. Modified rearing systems instead of total free-range system of rearing need to be developed.
- **Biosecurity issues:** At present highly pathogenic avian influenza is a serious constraint to family poultry production, which requires mass destruction of the poultry of the outbreak locality. It is therefore essential to chalk out programmes to prevent such outbreaks and methods to be adopted in such exigencies.

Suggested Action points

- a. Setting up of Micro-hatchery at farm level: The day old chick supply is low from the State owned institutions. Also, the import of day old chicks is expensive. Therefore, hatching and brooder needs to be pushed to the farm level by leveraging technology. Backyard poultry units, broiler and layer units, integrated with micro hatchery units on a subsidy model may be popularised.
- b. Reinvigorate the backyard poultry with improved breeds: ICAR has developed over 20 of coloured chicken breeds, many of which are dual-purpose types, suitable for both meat and egg production. Its broilers gain 1.5 to 2 kg in six weeks. Prominent among the new breeds on offer are Vanaraja, Gramapriya, Krishbro and Madhavaram chicken-1. These are meant largely for backyard free-range poultry farming and small-scale commercial units in and around rural areas. Birds of all these breeds have good marketability because of their multi-hued plumage and brownish eggs. Some of them, notably Krishbro, can easily be sold as desi chicken to claim higher prices. Its meat, too, resembles that of native birds.
- c. Model schemes in poultry sector have been prepared by NABARD and are available in website www.nabard.org. Banks may adopt the same with suitable modifications to suit local conditions.
- d. The requirement of egg and its production are become wider and only about 28% of the egg required in produced domestically through backyard / free range system. Empowering the small farmers with micro cage layer system whereby small number of birds can be reared by them in prefabricated metal cages, through intensive rearing and the egg collected, branded and marketed.
- e. Promote Producer Companies with backward linkage of farm enterprises and forward linkage with the marketing / processing firms both in the Public / Private Sector.
- f. The state Government has to formulate different schemes under the Department of Animal Husbandry and KEPCO for supporting the farmers in the areas of construction of broiler sheds and purchase of equipment, cost of one day old chicks, feed, medicine and labour cost for the first cycle.
- g. Convergence of the Govt. Sponsored programmes with the programmes of local bodies and NGOs.
- h. Continuous and constant monitoring of the health parameters through education and



- awareness creation among farmers.
- i. Considering broiler farming as an agricultural activity, the electricity rate shall be fixed at agricultural tariff.

Strategies for increasing Farmers' Income

- Integrated farming of crops with poultry including backyard poultry would bring in additional revenue.
- Apart from supply of eggs in the local market, tie up arrangements with established bakeries, retail market outlet can bring in supplementary income to poultry growers.
- Marketing of eggs and meat through collective FPCs/FPOs would yield better revenue as at present marketing of eggs as well as meat is controlled by traders/ middlemen
- Similarly, marketing of poultry dung/ droppings as organic manure in an organized set up will provide an additional income to the farmers.

Climate Change impact

Poultry seems to be particularly sensitive to temperature-associated environmental challenges, especially heat stress. It has been noted that modern poultry genotypes produce more body heat, due to their greater metabolic activity. Understanding and controlling environmental conditions is crucial to successful poultry production and welfare. In poultry, there will be immunosuppressing effect of heat stress on broilers and laying hens, although using different measurements. Decreased feed intake is very likely the starting point of most detrimental effects of heat stress on production, leading to decreased body weight, feed efficiency, egg production and quality. It is found that the farmers will get a set back by decreased production of egg in the coming years especially during the summer period. The production reduction will be atleast 10% less of the expected quantity of production of egg and in this way the sector will be suffering a loss of atleast 18 crores.

Floods in August 2018: The recent floods in State have severely impacted the Animal Husbandry Sector. Around seven lakh poultry has been estimated to have perished. Prolonged exposure to water had led to skin lesions and other animal diseases. There is a severe shortage of poultry feed in the flood affected areas.

The Department may prepare a plan of action keeping in view of the losses caused to the sector by pooling available financial resources to restore the lost growth impulse of the sector by kick-starting entrepreneurship. Any investment in this sector at this juncture would not be too high, since it could have a multiplier effect on the local economy.

Credit Potential for 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the district wise **credit potential assessed for the year has been assessed at Rs.772.92 crore.**

4.1.8 ANIMAL HUSBANDRY – SHEEP / GOAT / PIGGERY ETC.

Introduction

India's livestock sector is one of the largest in the world. It has 56.7 percent of world's buffaloes 12.5 percent cattle and 20.4 percent small ruminants. As a supplementary income generating activity, goat, rabbit and piggery rearing for meat is popular in the rural areas of Kerala. Small ruminants make an important contribution to the sustenance of small and marginal landholders and landless rural people. In Kerala majority of livestock owning farmers are either small and marginal or even landless. In view of its suitability for combining with crop sub sector and sustainability as a household

enterprise with the active involvement of women, it is emerging as a very popular supplementary avocation in the small farms.

In Kerala the livestock are raised both in backyards and commercial farms. Of the total livestock keepers in Kerala, about 10% keep goat. The total number of goat in the state as per latest Govt. statistics is 1.24 million numbers and the total number of pigs in the state is 60.74 lakh. As per the livestock Census 2012, there is a 27.94% decline in number of goat population during the inter censuses period (2007-2012). Similarly, there is a 5.48% decrease in number of pigs during the inter censuses period (2007-2012).

Goat farming can be a profitable occupation for a farmer and can fit well into mixed farming. Piggery is undertaken mainly by isolated households in rural areas of hilly regions due to ecological problems associated with it. The main reason why sheep farming is not preferred in Kerala is because of the climate. The tropical hot and humid climate of Kerala is not suitable for sheep farming or its end products

Meat production in Kerala comprises of beef, mutton, pork and broiler chicken. Out of this, beef is almost entirely from the culled animals brought from the neighbouring states.

The ground level credit flow to the sector during last 3 years (2015-16, 2016-17 & 2017-18) were Rs.312.39 crore, Rs.357.96 crore and Rs.97.59 crore respectively. The reduction in 2017-18 may be due to mis-classification.

Strengths of the sector

- a) Goat is most suited to Kerala conditions and they are more hardy, multi-utility, easy-to-maintain and prolific animals that can efficiently convert low-value vegetation, tree leaves and crop residues into high value meat, milk, hide, manure and fibre, including the much sought-after Pashmina fibre. The Malabari Goat is considered as the most reliable breed.
- b) Goat farms under the animal husbandry department are rearing different breeds of goat like Malabari, Attapadi Black, etc. The Agali Goat Farm is maintaining a stock of Attapadi Black. The remaining five farms are engaged in the conservation and propagation of the Malabari breed. There are 3 Goat Farms and 3 Goat rearing units under the department.
- c) Pig farms under the Animal Husbandry Department are functioning as production and demonstration units to farmers. There are 7 Pig breeding units and 1 Pig breeding farm under the department.
- d) The Kerala livestock Development Board was formed in 1976 by integrating the Indo-Swiss Project Kerala and the Bull Station, Dhoni of the Dairy Development Department. It is a registered company fully owned by the Government of Kerala. KLD Board is one among the many agencies entrusted with the task of implementing the Breeding Policy of the State.
- e) The demand for meat is increasing in the domestic and export market and consumers' outlook is changing towards quality meat and meat products.
- f) Pigs convert inedible feeds, forages, certain grain byproducts obtained from mills, meat by products, damaged feeds and garbage into valuable nutritious meat. The carcass return is quite high ie. 60-80 percent of live body weight.
- g) Pig grows fast and is a prolific breeder, farrowing 10 to 12 piglets at a time. It is capable of producing two litters per year under optimal management conditions
- h) The backyard poultry sector is a great potential of uplift people, especially women out of poverty.
- i) The presence of institutional infrastructure to support value chain interventions like Kerala State Poultry Development Corporation (KEPCO), Meat Products of India Ltd (MPI) and other private sector players.
- j) Promotion of the activities by Government, Kudumbashree as a livelihood activity.

Issues, Constraints, opportunities & emerging trends

- a) There is a 27.94% decline in number of goat population during 2007 to 2012 census period.
- b) Non-availability of quality animals: Quality goats and piglets are not easily available in the State. The three government goat farms in the State have goat breeding programme which alone is not sufficient to cater to the demand for kidding.
- c) Non-availability of feed / high cost of feed
- d) Non-availability of scientific slaughter houses for production of clean and hygienic meat production is lacking in many parts of the state.
- e) Scientific disposal of the wastes and by-products from the slaughter houses is more or less lacking in the sector which lead to various environmental problems.
- f) The shortage of pasture lands and the necessity of obtaining clearance from forest department for financing goat under free-range system limits the potential available for encouraging goat rearing.
- g) Non-availability of insurance for livestock.

Suggestions / Strategies for consideration

- Capacity of the existing goat/ pig farms / breeders of the Government, KSPDC and Meat Products of India may be increased to meet the increased demand for goat kids, piglets and chickens.
- Create infrastructure facilities at Goat and Pig breeding farms to produce and supply good quality does and piglets.
- Model schemes in Sheep/Goat/Piggery have been prepared by NABARD and are available in website www.nabard.org. Banks may adopt the same with suitable modifications to suit local conditions.
- The database of the bovine population of the State would be codified for efficient animal health control and vaccination programmes, proper traceability in the case of outbreaks of trans boundary diseases, genetic improvement and cross breeding, with the help of modern technologies such as RFID would be formed
- The goat rearing shall be taken up through Farmers, JLGs, SHGs/ Kudumbashree and tribal groups particularly in hilly tracts with support from local bodies.
- The 'Aadu Gramam' project of Kudumbashree Mission may be replicated in more grama panchayats.
- Formation of Producer companies of Goat Farmers may be promoted to increase the benefits through collective investment.
- AH Deptt. and Banks may make coordinated efforts to promote semi-intensive stall-fed goat rearing due to limited land availability. Dept. may also provide training and other assistance to SHG members willing to take up goat/rabbit rearing units.
- Disease monitoring and preventive measures in case of goats and rabbits may be strengthened. Govt. may devise programmes for vaccinating entire animal population of the state.
- Studies of KVK, Malappuram has proved that artificial insemination (AI) in goats will lead to an increase in weight gain to the tune of about 2 kg by 6 months in kids born through AI. Therefore, AI may be promoted in all the goat rearing areas.



- Establishment of a modern abattoir for cleaning and processing of meat with hygiene & modernization of slaughter houses. Block Panchayats have to take initiative for setting up Modern Slaughter Houses in the blocks for which financial assistance can be obtained from NABARD under RIDF.
- The waste from the slaughter houses may be converted into pet food, meat cum bone powder, rendered fat, fresh dog pack and organic fertilizer.
- Provision of Animal Health Services through local man power by providing adequate capacity building. Creating a network of Animal Health Workers specifically trained to provide vaccinations, de-worming, first aid, small ruminant and vaccination for a fee.
- Enabling inter agency coordination among the stakeholders like Kudumbashree, KSPDC, MPI and different Government Departments.

Strategies for increasing Farmers' Income

- Integrated farming of crops with goat rearing would bring in additional revenue even if the crop fails due to vagaries of nature. The earning not only comes from selling of goats but also from its droppings as it is considered as a good organic manure.
- Marketing of goats through collective FPCs/FPOs would yield better revenue as at present marketing of live animals as well as meat is controlled by traders/ middlemen.

Climate Change Impact

Although the benefits from sheep and goats hold great promise, the current level of its contribution to supporting rural livelihoods is low due to climate change related factors. Thermal, nutritional, and water related stresses, and restlessness are some of the consequences of climate change related factors that affect sheep and goat productivity. Increased incidence of disease and parasitic infection, decreasing trend of feed and fodder resources, low productive and reproductive performance are some of the consequences mainly related to the negative effects of climate change. Among the livestock species, sheep and goats are more vulnerable due to their heavily reliance on climate sensitive resources. Adaptation, therefore, remains one of the policy options to address climatic challenges prevailed on the livestock sector such as on sheep and goats.

Floods in August 2018: The recent floods in State have severely impacted the Animal Husbandry Sector. Several milch cows, goats, poultry birds and other animals were washed away. Around 12000 goats has been estimated to have perished. The livestock and other farms including cattle sheds were decimated and the livelihoods of hundreds of livestock farmers destroyed. Prolonged exposure to water had led to skin lesions and other animal diseases.

The Department may prepare a plan of action keeping in view of the loses caused to the sector by pooling available financial resources to restore the lost growth impulse of the sector by kick-starting entrepreneurship. Any investment in this sector at this juncture would not be too high, since it could have a multiplier effect on the local economy.

Credit Potential for 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the district wise **credit potential assessed for the year has been assessed at Rs.866.39 crore**. The District wise credit potential is given in Annexure I.

4.1.9 FISHERIES DEVELOPMENT

Introduction

The fisheries sector contributes to the national income, exports, food and nutritional security and employment generation. Constituting about 6.3% of the global fish production, the sector contributes to 1.1% of the GDP and 5.15% of the agricultural GDP.

Fisheries sector plays a crucial role in the well-being of Kerala's economy. This sector contributes around 1.58% to the total GSDP and provides employment and income to more than one million people, either directly or indirectly. It satisfies the protein requirements of a considerable chunk of the underprivileged population and provides considerable revenue, especially in foreign exchange, to the exchequer of the state. The total populace of fisher folk residing in the state of Kerala is estimated to be 10.29 lakh, which includes 7.92 lakh in the marine sector and 2.37 in the inland sector. Out of this, the number of active fishermen is 2.36 lakh (1.86 lakh in marine sector and 0.50 lakh in the inland sector). Currently, there are 222 fishing villages in the marine and 113 fishing villages in the inland sector, where fishing and relative aspects provide livelihood to a vast majority of a population. Nearly 12% of the fisher folk eke out their living from allied activities like marketing/repairing nets, fish vending, processing and other fishery related activities.

Among the maritime states in India, Kerala occupies the **foremost position in marine fish production**, accounting for about 20% of the total landings. The state is endowed with a long coast line of 590 kms and 4 lakh hectare rich inland water bodies consisting of 44 rivers, 49 reservoirs, fresh water ponds, tanks, 53 backwater bodies and extensive brackish water area of 1.24 lakh ha comprising backwaters, canals and prawn filtration fields. This makes Kerala a leading fish producing state in the country. Kerala accounts for about 7.6% of India's total fish production which is currently estimated at about 91 lakh tonnes. It also earns the state a great deal of foreign exchange amounting to Rs.5000 crore (159141 MT) during the year 2016-17. The state's share in all India exports has been around 14 per cent.

The State's fisheries sector is a huge one, comprising of 19,173 crafts out of which about 7% are mechanised, 44% are motorised and the remaining 49% are non-motorised crafts. Although the fish catches from Kerala coast include more than 300 different species, the commercially important number are about forty only.



The total fish production in the state during 2016-17 was 6.76 lakh tonnes, of which 4.88 lakh tons came from marine sources and 1.88 lakh tons from inland sources. Fisheries sector of Kerala is characterized by the predominance of marine sub-sector as nearly 80 per cent of the total production comes from marine sources.

There is an estimated 1.26 lakh ha area of brackish water resources consisting of 0.65 lakh ha of brackish waters, 0.46 lakh ha. of backwaters and canals, 0.13 lakhs ha. of prawn filtration fields in the state. The paddy fields comprising of 17000 ha of Kole lands distributed in Thrissur and Malappuram districts and 35,000 hectares of *padasekharams* distributed in Alappuzha, Kottayam and Pathanamthitta districts in Kuttanad. Of this an area of about 1000 ha is currently used for the culture of Scampi/fishes. Utilization of paddy fields for aquaculture will ensure the augmentation of fish/ prawn production in addition to paddy and creation of additional income for farmers especially in rural areas of the State. Integration of aquaculture can help to raise the income of the rice farmers also.

The ground level credit flow to fisheries sector in the state during 2015-16, 2016-17 and 2017-18 were Rs.302.04 crore, Rs.343.33 crore and Rs.244.37 crore, respectively.

Strengths

- a. The per capita consumption of fish in the State is 27 kg per annum against the national average of 3.5 kg. With over 90% of the population being fish eaters, fish plays an important role in the state's food security
- b. The fish processing sector enjoys export competitiveness because of lower labour costs and post-harvest expenses compared to developed countries.
- c. 16 Fishing Harbours and 204 marine Fish Landing Centres in the state.
- d. Proactive government intervention and Fishermen friendly policies.
- e. Untapped potential: Hardly 25 per cent of the total 4 lakh hectares of rich inland water sources supported fisheries activities now.
- f. Kuttanad paddy fields and kole lands offer unique mutually beneficial vast inland fishery potential.

Issues, Constraints, opportunities & emerging trends

- (i) **Declining catch:** Over 80% of current fishing activity is confined to the shallow waters near the seashores. There are several adverse impacts to overexploiting the coastal areas. The number of fish catches per trip in this zone is declining rapidly. This has, in turn, spurred fishermen to reduce the mesh size of trawl nets, thereby netting large quantities of non-targeted and small sized fish.
- (ii) **Equipment and technological constraints:** Most fishermen own small or medium-sized trawlers that are ill-equipped to operate beyond a depth of 250 metres. Lack of precise information on where to find the targeted fish, also hinders better exploitation of the deep sea. Such knowledge can help cut the cost and effort involved in deep-sea fishing substantially.
- (iii) **Continuous Decline in production:** Kerala has recorded the lowest fish production growth rate amid coastal states in India between 2004-05 and 2010-11. The state recorded a compounded annual growth rate (CAGR) of only about 0.09 % during the period while Karnataka, which has emerged as the leading coastal state in fish production growth, has posted a CAGR of 11.48%.
- (iv) **Low produce per fisher:** The Active fishermen population in India is estimated at 9 lakhs. Comparatively active fishermen population at Iceland and New Zealand is 12,000. These two countries together produce 2.6 million tonnes annually ie. (216 t/fisher) whereas with more fishermen, India produce less (2.9 t/fisher).
- (v) **Chronic shortage of fish seeds:** Inadequate supply of quality fish seed, fresh water prawn and brackish water shrimp and fish and seed material for culture of mussel, oyster and crab.
- (vi) Lack of marketing linkages for non-conventional varieties like clams, mussels and oysters.
- (vii) **Economic deprivation and malnourishment:** About 28% of the fishermen households in the state still live below the poverty line. The National Sample Survey data also indicate that most fishermen were undernourished, being highly deficit in both calories and protein intake.
- (viii) **High Post-harvest losses** (discard, spoilage, reduced quality). The market support system is very poor and there is a need to develop an efficient cold chain for safe and hygienic handling and marketing of fish and fishery products.
- (ix) **Manpower constraint in inland fishery:** The inland fishery in the state holds immense untapped potential, only 25% of 4 lakh hectares of inland water sources are being utilised at present. With just 22% of the total active fishermen in the state engaged in inland fishery, manpower constraint / shortage is one of the major constraint affecting the sector. The marine fishery sector which employs nearly 80% of active fishermen has been showing steady decline in catch over last 20 years and consequent in decline in per fisher yield.

- (x) **Environmental issues** : The adverse environmental fallout, especially of coastal shrimp culture; global depression in the prices of fish and fish products; stringent new sanitary and phyto-sanitary (SPS) norms; need for compliance with provisions of multilateral agreements; etc. continues to pose serious challenge to the sector.

Opportunities and new emerging trends

- (i) **Vast untapped potential exists in deep sea:** A comprehensive study entitled "assessment of demersal fishery resources along the continental slope area of the Indian EEZ and the central Indian ocean" by Kochi-based Central Institute of Fisheries Technology (CIFT) has helped trace as many as 155 new fish species in water depths ranging from 50 to 1,100 metres. The most promising is the kind of a massive resource of unexploited oceanic squids in the Arabian Sea. It is a gold mine since the oceanic squid (Cephalopoda) and deep-sea flying squid, is a prized seafood delicacy with tremendous export potential.
- (ii) **Huge untapped potential:** India is the second largest fish producer in the world. A comparison with China, world's largest producer reveals the quantum of untapped potential that exists -China's production of food fish was 411.08 lakh tonnes, while India's was 42.09 lakh tonnes, just around ten per cent. Indian aquaculture was limited to less than ten species of fish, while China cultures over a 100 species on a commercial scale.
- (iii) **Inland fishery holds more promise:** The marine fish capture in the country has increased by only about 36 per cent during the last decade while there was a 234 per cent rise in the inland fish production during the same period. This shows the potential for development in this sector. The lack of a uniform policy to use its water bodies for aquaculture including the coastal areas is a major policy bottleneck.
- (iv) **The Kerala Fish Seed Bill, 2014** seeks to bring in "an integrated planning, monitoring and management mechanism" for ensuring supply of quality fish seed to inland fish farmers is a welcome step. This will remove the chronic storage of fish seeds and will lead to the supply spurring growth in demand, spread of inland fish farming to more areas in the State, and thus growth in production.

Suggested Action Points

- a. **Strengthening current fishery management regime:** To avoid overfishing and overcapitalization of coastal fisheries, effective fisheries management plans are required with a strong will to implement, with the acceptance of all stakeholders. There is a need to shift from open access fisheries to regulated fisheries. The current management regime is based on input control such as seasonal and spatial closures and mesh size regulation. In addition to strengthening these input control measures, output control such as catch quotas and certification may be implemented. Vulnerable species need to be identified and protected by following standard methodologies. The performance of management interventions should be reviewed from time-to-time and adapted. It has now been recognized globally that fish and fisheries are only a part of the marine ecosystem which provides us with innumerable goods and services. This paved the way for "Ecosystem Approach to Fisheries Management" (EAFM) which aims at development and management of fisheries while considering the health of the marine ecosystem. India too needs to shift from traditional single species management approach to EAFM for sustainable ecosystems.
- b. **Exploitation of Oceanic Resources:** The oceanic waters of the Indian EEZ too remain less explored and exploited where high quality large pelagic fish such as tunas, barracudas, sharks, billfishes, oceanic squids and pelagic crabs are abundant. The anticipated extension of EEZ up to 350 nm will add to our exploitable area and potential. The excess fishing capacity of inshore waters can be effectively re-deployed to the oceanic waters for exploiting the oceanic resources. This in turn will relieve the coastal stock from fishing pressure and may enhance the stock health and yield.

- c. **Mari culture:** Mariculture is envisaged to be the future of Indian marine fisheries. Despite enormous potential, mariculture has not yet developed into a major contributor of seafood production in India and Kerala. The approaches for the development of mariculture should include evolving viable technologies for seed production and farming of a large number of marine fin and shellfish species, expansion of farm area in coastal saline and suitable inshore and offshore regions and diversifying production systems such as coastal pond, raft and pen farming and inshore and offshore cage farming. In India, research on seed production has gained momentum; however, we are far behind not only on a global level but also in the Asia-Pacific Region. Hence there is an urgent need to develop and standardize seed production and farming techniques for at least two dozen species of high value marine finfish.
- d. **Ornamental fish culture:** This activity is fast emerging as a major activity in fisheries. Kerala with its highly conducive climatic conditions provides scope for the development of ornamental fisheries. This sector assumes special significance due to its huge potential in providing livelihood support to people in rural areas and also as a foreign exchange earner. It is estimated that over 150 ornamental fish trade units are functioning in the state. The state has rich resources of indigenous ornamental fish in various river systems that have the potential to earn income for the state. MPEDA is providing assistance for ornamental fish breeding and export.
- e. **Sustainable development of brackish water resources:** A majority of the brackish water areas are either left unused or used unscientifically. There is a need to evolve a strategy for optimum utilization of these potential resources. Diversification of farming using alternate species than shrimp is necessary for sustainable development of brackish water sector. Farming of fin fish species like sea bass (*Lates*), milk fish (*Chanos*), Pearlsport (karimeen) etc., need to be promoted. Technology for commercial production of seed for some of these species is now available. Mussel farming (green and brown mussel) has been demonstrated to be a commercially viable activity in brackish water and is being practised in many districts. This could be propagated as a livelihood support programme for women SHGs. Edible oyster farming is another potential activity suitable for brackish water. Support from CMFRI, ADAK etc., is available for these activities. Crab farming is yet another suitable activity for brackish water.
- f. **Fish Marketing:** An overhaul of the present domestic fish marketing system is essential for ensuring better returns to the fishermen. A Market Intelligence and Information System using a combination of real time data and ICT needs to be established. Regulation of domestic fish market (price, inflow, outflow, unsustainable fishing practices) through market driven incentives, new marketing strategies (live fish market), online marketing and future trading in marine fish through well-developed market grids are some of the opportunities. All these developments should be bolstered by an increase in private capital formation in fisheries vis-à-vis public investment (upgradation of berthing facilities, development of onshore infrastructures like large-scale storage, etc.) in fishery infrastructure. Besides, there is scope for investment in production of value added products, which will serve the needs of the high end domestic consumers, who will be looking for ready to cook or eat items.
- g. **Alternate Livelihoods for fishermen:** The fisher's households do not get a sustained income throughout the year due to various factors such as closed seasons, natural calamities like cyclones and other related factors, which affect their livelihood seriously. Hence a supporting income through any alternate livelihood options (ALO's) is very much essential. Various ALO's are being studied suiting to the location and their capability. Mariculture or sea cage farming including seaweed farming, repairing of crafts and gears are a few areas of ALO's which have proved successful.



h. **Adoption of new and emerging technologies for marine and inland sector :**

- **Cultivation of Vannamei:** *Leptopenaeus vannamei* (White leg shrimp) has been gaining momentum in the recent years due to its faster growth and disease resistance. The introduction of vannamei in India occurred under controlled conditions with a clear procedure laid down by the government. Following the risk analysis studies, the government decided for a large-scale introduction of commercial use of *vannamei* in 2009. However, *vannamei* culture has not become popular in Kerala and hence initiatives may be taken for promoting *vannamei* culture among farmers.
- **Specific Pathogen Free Tiger shrimp farming (SPF Tiger):** Utilisation of SPF Tiger Shrimp, *Penaeus monodon* seed may be developed along with its commercial production. This farming technique is expected to yield good and sustainable production from the aquaculture systems.
- **Cage Farming:** Cage culture technology has been developed and demonstrated successfully for species like Asian sea bass (*Lates calcarifer*), *Etroplus etc.* This method of culture can be promoted among farmers, particularly JLG groups. GIS-based site selection, by taking into account the social logistics, is an immediate requirement for the expansion of cage farming. Policy for leasing suitable sites, bank finance, and governmental support through subsidy assistance is the need of the hour.
- **Cage Farming in Reservoirs:** There is immense scope for supporting cage farming may be supported in reservoirs. Carps, Cat fishes, Mahseers or any other indigenous fish varieties can be selected.
- **All male Tilapia Farming:** (MPEDA) has developed technology for seed production and farming of GIFT Tilapia. The RGCA has also standardized Sex reversal techniques in the GIFT strain with hormone feeding for the production and supply of all male seed. RGCA has commenced the production of all male GIFT Tilapia seeds for supply to the Industry. The project also geared up to provide technology support to establish satellite breeding centres across the country for mass production and supply of seed to the Aquaculture industry.
- **All male Scampi Farming:** One of the major challenges being faced by the Scampi farmers today is the differential growth which causes low survivals and poor yields. To overcome this, Rajiv Gandhi Centre for Aquaculture (RGCA) successfully developed the First Proven Neofemale in the country and achieved production of all male progeny of the Giant fresh water prawn (Scampi – *Macrobrachium rosenbergii*).
- **Fish culture in Re-circulatory Aquaculture System (RAS):** There is good potential for RAS system of aquaculture especially where the space availability is less. Anabas, GIFT Tilapia are the candidate species for RAS culture.

- i. **Skill upgradation and financing of deep sea liners:** Deep sea fishery (beyond 250 m) is a high investment high risk sector. The traditional fisher folk being resource poor will not be able to make the investment on individual basis, an organised endeavour by organising fishermen in to Producer companies can be a way forward. New financing model by including the existing GOI's subsidy scheme and interest subvention support from State government for Fishermen Producer Company can be formulated for financing deep sea liners/ tuna liners.
- j. **Quality infrastructure:** The highly perishable nature of fish, bulk production, diversity of production and consumption of fish commands ample facilities for processing and marketing. It is imperative that the level of hygiene in the harbours be improved taking into consideration the issues in each harbour. They have to be run from the perspective of post-harvest management by implementing Hazard Analysis and Critical Control Points (HACCP) to promote exports. Integrated harbour management societies may be constituted for each harbour.

- k. **Insurance:** Insurance premium is generally high in case of fisheries activities, in view of high risk perception. The insurance schemes need to be liberalised and norms to be made farmer friendly.
- l. **Interest subvention:** While GoI is providing interest subvention to banks on the short term agriculture crop loans extended to farmers, similar facility is not available for loans extended to fisheries sector, especially marine fisheries, sector for procuring inputs, working capital, marketing etc. In order to support the fishermen community, Govt. of Kerala may consider providing interest subvention on the loans extended by banks to fishermen for procuring inputs, working capital, marketing etc. either directly or through agencies like MATSYAFED.

Climate Change

Climate Change has huge implications on fisheries and coastal resources of the state. With the increasing temperature of the sea due to climate change, small fish and plants vanish first. The change in the availability of oxygen threatens almost all the species. In the state, 10 species of fresh water fish have been identified as most threatened to climate change. Most fish species have a narrow range of optimum temperatures related to their basic metabolism and availability of food organisms. Even a difference of 1 degree C in water may affect their distribution and life processes. Climate Change impact on Inland fisheries include stress on fish species due to depletion of inland water bodies, decreased fish spawning, increased water borne diseases among fishes, outbreak of diseases during drought in inland water bodies, heavy deposit of silt during heavy flood events etc.

Strategy to address climate change issues include: Promote Sustainable inland fisheries activities, Establish Fish sanctuaries, Propagation of indigenous and commercially important inland fishes, Monitoring diseases incidence in aquaculture, improving energy efficiency in fisheries sector. Alternate and sustainable employment and livelihood to the fishermen and their families especially investing in education and training for occupations.

Strategies for increasing Farmers' Income

- Cluster Approach may be adopted by Fisheries Department and other related agencies to promote better aquaculture management practices, collective marketing, common infrastructure and pollution control for sustainable brackish water aquaculture.
- By suitably restructuring the land lease policies, the government owned brackish water areas suitable for coastal aquaculture may be allotted to fishing cooperatives, self-help groups, unemployed youth and private entrepreneurs for long periods for promoting sustainable aquaculture system through a transparent allotment policy.
- Feasible locations of bays, creeks, back waters, mangroves in the coastal region may be identified for taking up of mari-culture in a phased manner with the assistance of MPEDA.

Credit Projections for 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the district wise **credit potential for the year 2019-20 has been assessed at Rs.613.37 crore.**

4.2 AGRICULTURE INFRASTRUCTURE

Introduction

Agriculture will be prosperous, if it is socially inclusive and environmentally friendly. In coming years, there will be a paradigm shift from subsistence farming to highly knowledge- intensive, competitive farming. Agriculture Infrastructure is the most essential input required for the development of agriculture. Adequate supply of quality inputs like seed, planting materials, organic inputs like vermi-compost, bio-fertilizers etc. are important for a healthy crop as well as a bumper yield. Soil and water management practices are closely knitted to crop management. The focus will be on increasing competitiveness and productivity in agriculture so as to raise incomes and well-being of the stakeholders and converting the farmers into agri-preneurs.

Infrastructure required in the Agricultural sector like Storage and Market yards including cold storages and cold chains, land development, soil conservation and watershed development. Tissue culture, Agri bio-technology, seed production, bio pesticides/ fertilizer, vermi-composting, etc. Establishment of scientific post-harvest management handling systems, creation of adequate storage space, cold chain for the perishables, market infrastructure, scientific transportation are highly required to minimize wastage of food and ensure better returns to the producer.



4.2.1 Construction of Storage Facilities

Planning for growth in agricultural output should be complemented by organized/ institutionalized efforts for promoting effective post-harvest handling and processing, augmenting storage / buffer stocking capacity and enhancing marketing infrastructure for marketing/ storage of agricultural produce. Whereas good post-harvest mechanisms prevent losses due to spoilage, well-functioning

agricultural markets provide the basis for capitalizing on market opportunities and benefiting from increased farm productivity. Achieving the above objective requires a concerted effort from the Government, financing institutions, private entrepreneurs and other stakeholders as creation of capacity and infrastructure requires large scale investments in the sector.

Status

The production of food grains and pulses in Kerala during 2016-17 was 4.38 lakh MT. The production of spices like pepper, ginger and, turmeric was 0.610 lakh MT whereas areca nut accounted for a production of about 1.168 lakh MT, production of coffee and tea was 1.25 lakh MT (Kerala Agricultural Statistics, 2016-17). Whereas the production of paddy is considered to be only about 15% of demand, other food items like vegetables, fruits and milk are also imported from neighboring States.

Kerala State Warehousing Corporation is running 56 Warehouses throughout Kerala State with a total capacity of 2.76 lakh MT (constructed capacity of 2.04 lakh MT and hired capacity of 0.72 lakh MT). There other agencies in Kerala involved in warehousing are Central Warehousing Corporation (1.3 lakh MT) and Food Corporation of India (5.36 lakh MT).

Credit Linked Subsidy Schemes

In Kerala under Rural Godown scheme, about 55806.235 MT capacity of storage capacity has been created. Under Gramin Bhandaran Yojana 211 schemes have been sanctioned for creating 90842 tones for which subsidy to the tune of 2.79 crore has been released.

Government of India created Agriculture Market Infrastructure (AMI) Scheme by merging the earlier scheme of Grameen Bhandaran Yojana (Rural Godown Scheme) with Scheme for Development of Agricultural Marketing Infrastructure (AMIGS). As on 31 December 2018, 342 schemes were sanctioned under AMI Scheme in Kerala with a TFO of Rs.229.65 crore, Bank Loan of Rs.166.23 crore and the Subsidy released so far Rs.53.16 crore.

Credit flow towards the sector

The flow of credit for warehousing / agricultural marketing activity has increased significantly during the last 5 years but still not been commensurate with the potential available. The Ground Level Credit (GLC) flow and refinance during the last 5 years for agricultural warehousing and marketing activities is given below:

Credit Flow and NABARD Refinance to the SGMV sector

(Rs. lakh)

Year	Ground Level Credit	NABARD Refinance released
2013-14	1468.04	741.95
2014-15	5631.97	106.10
2015-16	7453.64	9.95
2016-17	16503.02	--
2017-18	8413.55	--

Initiatives taken by the Stakeholders

- DMI is regularly conducting District / State level workshops to propagate the schemes.
- Commercial Banks are actively involved in the subsidy schemes. They are also conducting promotional programmes regularly at their Staff Training Institutes.
- GoI has introduced Negotiable Warehouse Receipts and is also extending subsidized pledge loans against the same.
- After the merger of Forward Markets Commission (FMC) with Securities and Exchange Board of India (SEBI) in Sept 2015, SEBI is taking measures to bring about awareness amongst farmers on aspects related commodity trading, price realization, etc.
- The intervention of Hortcorp (Kerala State Horticulture Product Development Corporation) and VFPCK have enabled better price realization in respect of horticulture produces and also lower prices for consumers.

Issues, Constraints, opportunities & emerging trends

- As per Food Security Act, 2013 an additional 7 lakh MT storage capacity is estimated for the State. For this purpose, godowns are to be constructed at each taluk. Financial support is critical for achieving this goal.
- Non-availability of land is a major factor hindering growth of warehousing sector in Kerala.
- Insufficient storage infrastructure facilities are available for farming community in the State for scientific storage of farm produce like rubber, coconut, arecanut, spices etc.
- Lack of Awareness Negotiable Warehouse Receipts and pledge loans.
- The inadequacy of agricultural marketing infrastructure
- Absence of Information dissemination system
- Lack of awareness among farmers

Suggested Action points

State Government

- a) Creation of appropriate legal framework and land acquisition policy for infrastructure projects
- b) Government may explore the possibility of allocation of land from the common pool land available with panchayats, taluks for creation of warehouses.
- c) The land / godowns available with the PACS could also be used for storage
- d) Time bound schedule for documentations like licences / registration certificates
- e) Providing for / promotion of e-auction facilities, modern spot markets, etc.
- f) Promotion of Renovation / Modernisation of existing warehouses and their adoption of modern warehousing techniques to improve efficiency.
- g) Establishment of marketing infrastructure projects/ godowns may be encouraged. All the financing agencies including RRB, DCB and PCARDBs should show more enthusiasm to extend credit facility to this vital sector.
- h) Market Yards, Cold Storage, Agriculture Marketing Infrastructure including modern hi-tech abattoirs and meat processing units may be promoted by the Panchayat Raj Institutions in association with the developmental agencies, financing institutions including NABARD under RIDF.

Banks

- a) Sensitise prospective borrowers about the schemes
- b) Popularise NWRs finance and extend pledge loans to farmers.
- c) Banks may encourage private entrepreneurs to set up rural godowns, cold storage and market yards by creating adequate awareness. Banks may popularize produce marketing loan schemes on the pledge of warehouse receipts for which interest subvention is also available.

Strategies for increasing Farmers' Income

- Post-harvest handling systems including storage – The state which offers good scope for on farm drying of farm produce (especially arecanut, coconut, pepper, cardamom etc.). At present, this is mostly being done in a crude manner. There is need for construction of drying platforms for the benefit of the farmers before these goods are taken to the storage facilities.
- The warehousing facilities available with PACS need to be utilized by the farmers by availing pledge loan so that distress sale at the time of harvest can be reduced which ensures better price realization for farmers.

Credit Potential for the sector – 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the **district wise credit potential assessed for the year has been assessed at Rs.385.42 crore.**

4.2.2 Land Development, Soil Conservation, Watershed Development

Introduction

Soil and water are the two basic natural resources, proper management of which governs the agricultural productivity on a sustained basis. Therefore, it is imperative that all developmental agencies including banks, must have concern for judicious exploitation and conservation of these resources. This also entails maintaining proper soil health and water quality to achieve the ultimately desired agricultural productivity.

The investment in various land development activities includes all those that aims at restoring/improving soil health, i.e., modern soil testing laboratory with facility for scientific prescription for crop specific soil test based fertiliser application, land levelling, bunding (contour bund, farm bund), terracing, reclamation of salt affected/ waterlogged soils, farm ponds, production of organic inputs, bio control lab, watershed development, underground pipe line, command area development works (that involves bunding, levelling, field channels and field drains) in irrigation command, lining of field channels, etc. Besides, closely related activities, like seed production and processing, purchase of agricultural land by small and marginal farmers and farm fencing are also included under this sector.



The rate of growth of flow of ground level credit (GLC) under LD sector has been generally stagnant in the State during 2009-10 and 2011-12. However, from 2012-13 onwards credit absorption in the sector is in upward trend. The ground level credit flow to the sector in the state during 2015-16, 2016-17 and 2017-18 were Rs.1,678.57 crore, Rs.1,549.19 crore and Rs.1,470.38 crore respectively.

Issues, Constraints, opportunities & emerging trends

The State has an undulating topography with altitude upto 2694 metres above MSL. The foothills and coastal plains are vulnerable to floods, saline water intrusion and problems of poor drainage/water logging. Due to highly undulating/rolling terrain, high rainfall intensity and its uneven distribution, large areas especially in high-slope lands like western ghat regions are vulnerable to erosion, landslips and crop moisture stress.

Out of the total geographical area of 38.86 lakh Ha of the State, it is roughly estimated that 14.76 lakh Ha are prone to soil erosion hazards. It is estimated that around 3.82 lakh Ha area has been so far treated with soil and water conservation measures. About 5.25 lakh Ha low-lying areas in Onattukara, Kuttanad, Pokkali and Kole coastal tracts come under the 'Problem Area Zone' as per the NARP classification of agro-climatic zones; the soils in these areas, being inundated by backwaters almost for 8 months in a year, are generally acidic and develop salinity problems.

The deforestation and change in cropping pattern to cash crops have resulted in Ecological Features/ problems like - Drying up of rivers - Siltation of reservoirs - Drinking water scarcity during summer - Sudden floods etc.

Rampant sand mining in upper reaches has resulted in reduced flow rate due to destruction of natural watershed. River-sand mining is another serious factor contributing to the leaning of rivers. Sand base holds water and that is what makes the rivers 'perennial'.

Rampant conversion of paddy fields into residential plots and coconut plantations accentuating the water shortage in Kuttanad. Paddy fields apart from its primary use for paddy cultivation also serve as natural rainwater storages. If the average water level in a paddy field is one foot, an acre of the field will be holding 1200 M³ or 1,200,000 litres of water. This percolates down and replenishes the ground water.

The share of nearly 17 per cent area under irrigation is far below the all India share of 45.3 per cent. Over the years, area under irrigation has hardly improved in the state. The utilization of irrigation structures is also very poor. The improved techniques like introduction of laser leveller may be adopted for precision levelling for efficient utilization of irrigation water.

Farm Sector Promotion Fund

NABARD has constituted a fund named Farm Sector Promotion Fund (FSPF) by merging erstwhile Farmers Technology Transfer Fund (FTTF) and Farm Innovation Promotion Fund (FIPF) to promote innovations in the field of agriculture, support transfer of technology, sustainable scientific method of farming, to ensure increase in production, productivity and income of the farmers. Support from the Fund is available for activities which fall in the domain of agriculture and allied sectors. Eligible agencies are financial Institutions, Universities, KVKs, SFAC, NGO, Registered CBOs, POs, individuals, group of individuals and companies.

Watershed Development

Under NABARD Holistic Watershed Development Programme (NHWDP), 135 watershed projects covering 88,423 ha in the three distressed districts viz., Kasaragod, Wayanad and Palakkad have been implemented. Total grant assistance sanctioned was Rs.121.19 crore, against which an amount of Rs.109.80 crore was released. Details are given below:

(Rs. lakh)					
Sr. No.	Name of District	Total no. of projects	Total area treated (Ha)	Amount sanctioned	Amount released
1	Kasaragod	35	29199	4305.800	3941.371
2	Wayanad	55	31148	3778.950	3572.923
3	Palakkad	45	28076	4034.870	3465.603
Total		135	88423	12119.620	10979.897

Impact evaluation study by CWRDM, Kozhikode has brought out the socio- economic benefits of the watershed projects. There was increase in ground water table and availability of water in wells throughout the year, increase in cropping intensity and increased awareness about sustainable utilisation of natural resources among the beneficiaries.

Sustainability Development Plan (SDP) for watershed projects

Above said watershed projects were completed by 2013-14. To ensure continuance of watershed practices and to further increase the income and means of livelihood of the farmers in the watershed area, NABARD is implementing Sustainability Development Plan (SDP) in selected watersheds. As on date, in Kerala, NABARD has sanctioned 65 SDP projects with a financial assistance of Rs.5.20 crore, out of which, an amount of Rs.3.10 crore has been released as on 31.03.2018.

Suggested Action Points

- The positive features like participatory base level planning and Ridge to valley treatment technique successfully adopted in NABARD watershed projects implemented in Wayanad, Palakkad and Kasaragod under Prime Minister's special programme for distressed districts may be incorporated in watershed programmes being undertaken in the state.
- Increased Mono cropping is leading to deterioration of soil health. Integrated farming that integrate livestock, crop production and fisheries that was traditionally practiced in Kerala may be revived. In this system, an inter-related set of enterprises are used so that the "waste" from one component becomes an input for another part of the system, which reduces cost and improves production and/or income.

- The Departments of Agriculture and Land Development & Water Resources are implementing a large number of programmes on watershed development, reclamation of ravine lands and reclamation of saline soils, etc. This information needs to be shared with bankers through different fora like the SLBC, BLBCs, DLCC, DLRC, etc. There is an urgent need for bankers and planners to sit together and evolve a credit plus approach for areas where watershed works have taken place. The banking plan prepared by NABARD for NHWDP watershed projects undertaken in Palakkad, Kasaragod and Wayanad districts may be taken as a model.
- Financing and adoption of modern farm machinery like laser leveller, zero tillage machine, bed planter, rotavator, etc., for conservation tillage that will help conserving water as well as improving soil health by retaining biomass may be encouraged.
- A database of the soils of Kerala State is to be made indicating the different characteristics of the soils and the crops suited for them with the corrective measures needed for introducing alternate crops.

Strategies for increasing Farmers' Income

- Agricultural productivity can be increased through use of organic wastes for enrichment of soils and conservation of soil fertility through Jeevamrutham, Beejamrutham, Panchagavya, bio-pesticides and repellants, etc.
- Natural Resources Management - Major focus on maintaining soil fertility and improving water productivity in a sustainable manner. Application of fertilisers based on soil health cards and adoption of micro irrigation system has to improve in the district.

Credit Potential for 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the **district wise credit potential assessed for the year has been assessed at Rs.2,105.32 crore.**

4.2.3 OTHERS—Tissue Culture, Agri-Biotech, Seed Production, Bio-Pesticides/ Fertilizers, Vermicomposting, Etc.

Introduction

Availability of planting material of good quality is one of the most important factors that determines the quality of agricultural production. The production of registered and certified seeds under the supervision of Research Institutions through progressive farmers, farmers clubs etc., may be funded by the banks. The Kerala government has initiated efforts to promote organic farming in the State. The initiative is designed to encourage farmers to switch over to organic methods of cultivation, under a project to convert Kerala into a fully organic State by 2016. Organic farming in Kerala is gaining momentum and there is good demand for quality organic manures like farm yard manure and compost, bio-fertilisers and bio-pesticides. The technology of vermi compost production using unutilised crop residues and household wastes are available in plenty. In order to promote organic farming, NABARD has formulated a scheme for promotion of Local Organic Farmer's Group (LOFG), under participative Guarantee System for India to be implemented on cluster basis covering an area of 50 acres per cluster. Grant support is available to the cluster under promotional funds of NABARD, such as FSPF, PODF, TDF and WDF.

Issues, Constraints, opportunities & emerging trends

Non-availability of empirical data at block/panchayat level about the existing infrastructure available for activities like tissue culture, bio-fertilizer / bio-pesticide production, vermicomposting, seed production etc., potential available for setting up these units and the lack of an organized market for these products are the major infrastructural gaps identified. Many of the activities included under this sector have been covered under Land Development in earlier years and hence GLC is not analyzed separately.

Suggested Action points

- Government should formulate programmes for supplying fertilizers at a reduced rate for the small and marginal farmers of the state.
- The system of quality testing in the state is to be reinforced so that the fertilizer that reaches farmers must be of good quality as specified in the Fertilizer Control Order
- A comprehensive policy on organic farming incorporating aspects like quality control of organic manure, certification procedure of organic farms, approved agencies for certification etc. may be brought out by Agriculture Department. Ensuring availability of organic inputs is important in promoting organic farming.
- A standard package of practices recommendation may be evolved for organic cultivation of various crops for use by farmers, which would help in assessing the requirement of organic inputs and planting materials.
- Extension efforts to popularize organic farming may be initiated by involving farmers' clubs, NGOs, PRIs, etc.
- Establishment of tissue culture labs and seed production centres to ensure quality planting materials.
- Ensure organic farming approach in all the watershed development areas and extend support, including capacity building and bank loan for soil and water conservation measures.
- Establish testing facilities for soil, water, micro-nutrients and micro-organisms at least at the block level.
- Promoting bio-fencing as a means to ensure soil conservation and for green manure availability.
- The need for a certification programme for the tissue culture plants is imperative since inadvertent micro propagation of virus infected plants will not only result in its poor performance, but also in undesirable spread of viruses wherever such plants are grown.

Credit Potential for 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the district wise **credit potential assessed for the year has been assessed at Rs.158.72 crore.**

4.3 ANCILLARY ACTIVITIES

4.3.1 Food and Agro processing

Agro and food processing could be defined as the process of transforming agro and food based raw materials of plant or animal origin into different types of value added products, which are generally used for human consumption. The transformation may generally involve either processing or preservation techniques. Both these processes are intended to create edible or usable forms of products besides providing them improved storage and shelf life. Agro and food processing assumes importance in situations where the availability of the raw material is seasonal coupled with increasing demand for the product. Conversely, when agri-horticultural production increases, processing would be required to make the product available in its original or different form, retaining its

nutritive quality. Important sub sectors in food processing industries are Fruit & Vegetable Processing, Fish-processing, Milk Processing, Meat & Poultry Processing, Packaged/ Convenience Foods, Alcoholic beverages & Soft drinks and Grain Processing etc.

Status

The status of agro and food processing level is low and wastage of food products is considered very high. Value addition to raw produce in our country is only seven per cent as compared to 23 per cent in China, 45 per cent in Philippines and 188 per cent in United Kingdom.

Post-harvest technology and management plays a crucial role in value addition to agriculture. The post-harvest loss in the country is estimated to be in the range of 30 to 40 percent. This is due to lack of Post-Harvest Management (PHM) and the paucity of processing facilities. Horticultural products account for 10% of the total agri-exports and employs more than 19% of the labour force. Horticulture products (fruits, vegetables, flowers, nuts, plantation crops, spices, mushrooms and honey) account for 7% of the gross cropped area and about 20% of the agricultural output of the country. Horticultural production is expected to touch 350 million tonnes in the near future. Mango, banana, citrus, guava, papaya, pineapple and grape are major fruits and Brinjal, tomato, cabbage, onion, are major vegetables.

Agro-processing and value added product units are generally in the unorganized tiny sector, mainly in rural areas. Village level agro-processing units have created large number of self-employment opportunities. A large number of food and fruit processing units are also functioning under the SHG/Neighbourhood Groups of Kudumbasree. The rural based informal processing units are devoid of appropriate technology, processing standards, benefits of volume, standard packaging and market access. A rural based processing unit is generally endowed with raw material availability, but severely constrained in forward linkages, mainly marketing. Majority of the units being unregistered for various reasons, interventions to address their common problems have been limited and also difficult.

Kerala offers vast scope for setting up of a variety of industrial units for undertaking agro processing/food/ fruit processing, developing dairy products besides manufacture of ayurvedic medicines.

The net sown area of 19.80 lakh ha of the state constitutes 50.96% of the total geographical area of 38.86 lakh ha of the state. The gross cropped area is 25.84 lakh ha. While food crops occupy only 6.7% of the gross cropped area, plantation/ horticulture and other crops occupy the remaining. Kerala produces major commercial crops like pepper, cardamom, rubber, coconut, tea, coffee, cocoa, nutmeg, vanilla, cashew, tapioca etc. Various horticultural crops like mango, banana, pineapple, papaya, jackfruits etc. and vegetables like carrot, cabbage, potato, onion, cauliflower etc. are also produced, besides nearly 400 varieties of aromatic and medicinal crops. Kerala accounts for 97% of the country's pepper production, 70% of cocoa production and 25% of coffee. This unique aspect also opens up vast scope for post-harvest management, processing and value addition.

The State also accounts for 20% of the country's food exports. As per industry estimates, approximately Rs.5,000 crore worth of processed food is exported from Kerala annually.

The Agri-Export Zones of APEDA and the products thereof are enlisted below: -

Sl. No.	Focus Products	Geographical Areas
1	Horticultural products	Thrissur, Ernakulam, Kottayam, Alappuzha, Pathanamthitta, Kollam, Trivandrum, Idukki and Palakkad
2	Medicinal Plants	Wayanad, Malappuram, Palakkad, Thrissur, Ernakulam, Idukki, Kollam, Pathanamthitta and Trivandrum

Some of the existing food and agro processing products produced in the State are as under:

Name of raw material	Name of the product
Coconut	Coconut Water beverages, Coconut Vinegar, Coconut Milk, Coconut oil, desiccated coconut, coconut milk powder, Milling copra, edible copra, coconut chips, coconut oil cake, shell charcoal, coconut shell powder, activated carbon, coir, coir geo textiles, coir pith, Snow Ball tender nut
Banana	Chips, halwa, baby foods, banana powder, jam, pickle, halwa
Paddy	Rice, rice powder, puffed rice, rice flakes
Vanilla	Vanilla Extract
Jasmine	Perfumes, scents
Spices	Spices powder , Oleoresin extract, ready to use masala mix
Honey	Honey processing, soft drinks, jelly, confectionery
Pineapple	Squash and Jam
Milk	Chilled Milk, Milk products, ice creams, flavoured milk
Fish	Processed Fish, dried fish, fish meal, fish oil, pickles, cutlets
Meat	Processed Meat
Cereals , cocoa, etc.	Bakery products
Cashew nut/ apple	Processed cashew, juice, candies, pickles, jam syrup, squash, vinegar from cashew apple
Pepper	Oleoresin, White Pepper, Powdered Pepper
Jack fruit	Jack fruit bulbs in sugar syrup, jack fruit based fries, pickles, candies, syrup, burfi, biscuits from seeds, pappad, chips, halwa, jams etc.

Food Parks: KINFRA and KSIDC are implementing Mega Food Parks in Palakkad and Alappuzha respectively with investment of Rs.250 crore under MoFPI. Other designated food parks have been established at Kakkanchery, Adoor, Mazhvanoor, Nellad and Aroor.

State Govt. Initiatives

The Governments Industrial Policy seeks to convert Kerala into a favoured destination for Agro Processing Industries. State govt. has exempted tax duties on major commodities. The Make in Kerala initiative of the State Government has reduced burden of imports. Promotion of value of added products from Coconut-specifically Neera, flower production in high ranges, jack fruit processing etc. are being given special impetus.

Suggested Action Points

- More clusters are to be promoted under this sector for products based on Paddy, Animal Husbandry, Apiary, Poultry, etc.
- Establish a specialised Govt Agency to promote agro processing sector in the State.

- Creation of a minimum critical scale of infrastructure (backward and forward linkages) to prevent erosion in value.
- Most of the units are in unorganised sectors and hence it is necessary to form Clusters to bring these units under a formal set up.
- There are various institutions and Research Stations working with the same objectives. The services of these institutions are not fully utilized by the units in the un-organised tiny sector, especially by SHGs, resulting in adoption of low technology.
- There is need to promote group farming in form of Farmers producer organization or producer companies.
- Banks should make available adequate credit such societies and help them in improving scale of business which is key to profit.
- Low progress of ACABC scheme can be addressed by countering issues like inadequate follow up and handholding by the MANAGE sponsored Nodal Training Institutes, bankers and lack of awareness/interest among the agriculture and allied graduates.

Role of NABARD in Food Processing Sector

As per the directions of GoI and RBI, NABARD has set up a dedicated Food Processing Fund (FPF) of Rs.2000 crore in 2014, to meet the credit requirements of the sector. Financial assistance will be provided to State Governments, Government entities, JVs, Cooperatives, FPOs etc. Under FPF assistance (Term loan of Rs.28.34 crore) has been extended for establishment of the Mega Food Park at Palakkad with a total project cost of Rs.120.15 crore. The Mega Food Park at Palakkad is nearing completion and out of 49.76 acres of leasable area, 23.15 acres has already been leased out to various entrepreneurs.



Strategies for increasing Farmers' Income

- Instead of selling raw food grains through middlemen at the nearby markets, if the farmers aggregate through Farmers Interest Groups/ FPOs and provide value addition in the form of sorting, cleaning, grading, packaging, they can brand their produce and get better price than what they are presently getting. Hence value addition is the key to increase farm income.
- Marketing strategies need to be evolved to reduce the length of Supply Chain so that farmers can avoid the exploitation by middlemen (the possibilities of online marketing could also be explored under a common umbrella/ brand name by CBOs like SHGs).
- Vegetables/Fruits which are safe to eat could be branded appropriately and marketed to fetch premium price.

Credit Potential for 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the credit potential assessed for the year 2019-20 for the **Ancillary industries including agro and food processing sector is Rs.5528.75 crore.**

4.3.2 Other Ancillary Activities

The activities envisaged in this section include loans to cooperative societies of farmers for disposing of their produce, Agri-clinic/Agri-business centres (ACBC), Loans to PACS/FSS/LAMPS, Loans to MFIs for on-lending to agriculture and Food and agro processing. Agriculture ancillary activities provide necessary vigour and deepening of the agriculture sector activities. It provides the necessary spread and the requisite linkages for the sector to establish, strengthen and grow.

Agri-Clinic and Agri-Business Centres (ACABC) scheme has been envisaged to support agriculture development and to complement the governments' effort with private participation. It aims to supplement efforts of public extension local needs and affordability of target group of farmers. It also aims to create gainful self-employment opportunities to unemployed agriculture professionals. Agri-Clinics are envisaged to provide expert advice and services to farmers on various technologies which would enhance productivity of crops/animals and ensure increased income to farmers. Agri-Business Centres are commercial units of agri-ventures established by trained agriculture professionals for income generation and entrepreneurship development. Back ended composite subsidy upto 44% for projects upto Rs.1 crore (in group mode) can be taken up under the scheme.

4.4 MICRO, SMALL AND MEDIUM ENTERPRISES (MSME)

Introduction

The importance and contribution of the micro, small and medium enterprises to the economic growth and prosperity is well established. Development of MSME and Rural Non-Farm sector, in addition to its significant contribution to the National economy, gives enormous scope for generation of employment in rural areas, minimizes migration of rural people to cities/urban areas and also reduces the pressure of population on agriculture. MSME covers all economic activities like manufacturing, processing, repairs, construction, trade, transport and other services. The MSME sector in India is diverse in terms of size, levels of technology employed and products. There are 346.12 lakh units spread across the country employing 805.24 lakh workers.

NABARD has identified financing, development and promotion of Off Farm related activities as one of its thrust areas.

The limits for investment in plant and machinery/ equipment for manufacturing/ service enterprise, as notified by Ministry of Micro, Small and Medium Enterprises, vide S.O.1642(E) dated 9 September 2006 are as under.

Sector	Manufacturing Sector	Service Sector
	Investment in Plant & Machinery	Investment in Equipment
Micro Enterprises	Does not exceed twenty five lakh rupees	Does not exceed ten lakh rupees
Small Enterprises	More than twenty five lakh rupees but does not exceed five crore rupees	More than ten lakh rupees but does not exceed two crore rupees
Medium Enterprises	More than five crore rupees but does not exceed ten crore rupees	More than two crore rupees but does not exceed five crore rupees

Status of Micro small and Medium Enterprises in Kerala

The Kerala Perspective Plan – 2030 envisions “Kerala’s evolution into knowledge–driven competitive economy with spirit of entrepreneurship, innovation, social inclusion, tolerance and diversity” through the development of its MSME sector.

During the period from 2011-12 to 2014-15, MSME sector has registered consistent growth in investment and production and the sector is fast emerging into a major income generating and employment providing sector for various social groups like SC, ST, Women, youth helping in equitable distribution of income and wealth. As per the MSME survey & Quick Results of the 4th census, Kerala has 5.62% of the total MSME enterprises in India.

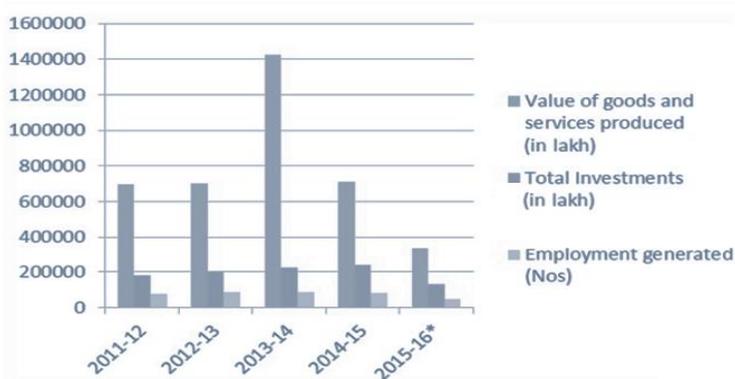
Micro, Small and Medium Enterprises (MSME) sector has the potential to emerge as a strong, vibrant and globally competitive sector in the State’s economy. The state enjoys comparative advantage among Indian states in select sectors. Most of them are resource/knowledge based a few of which are given below: This provides the state with opportunities to expand its base in technology-driven segments of the industry by building on this.

Out of 25 sectors identified in Make in India, the sectors which have potential in Kerala are Food processing, IT & BPM, Pharmaceuticals, Textiles and garments, Tourism and hospitality, Wellness and Construction. In addition to these, the traditional industries coming under this sector are handicrafts, Handloom, Khadi, Food processing industries, Garment making and Textile industries, industries related to coir/ wood/ bamboo/ Plastic/ rubber/ leather/ clay/ small scale manufacturing, electronic/electric components, etc.

Performance of the Sector in Kerala

Trends in investment & employment in MSME sector over the period from 2011-12 to 2015-16.

Production, Investment & Employment in MSME sector, 2011-12 to 2015-16



Source: Directorate of Industries & Commerce
Figures only up to September 17, 2016 for the year 2015-16.
Online registration in Udyog Aadhar started from September 18, 2016.

Status of Micro small and Medium Enterprises in Kerala

Traditional Sectors		
Sl. No.	Industry	Status
1	Coir	<p>Coir Sector is one of the major traditional industries in the State providing employment to nearly 3.75 lakh persons and is second to agriculture as a source of employment in Kerala. Out of 954 registered coir cooperative societies, only 382 are working. The Kerala State Coir Corporation, Foam Matting India Ltd are some of the other agencies working in the sector. To promote sustainable development of coir sector, Government of Kerala has constituted a separate administrative department and a Coir Directorate with 10 project offices in the State. The thrust areas for the development of Coir Industry are modernisation of production infrastructure, expansion of domestic market by publicity and propaganda, promotion of export of coir and new products, promotion of research and development activities in process improvement, product development and diversification, elimination of pollution, development of skilled man power through training.</p> <p>Weak procurement of coconut husk, increased production cost, shortage of coir fibre, Low raw material availability, technological obsolescence, inadequate marketing system, labour shortage are some of the main problems faced by the industry.</p>
2	Handloom	<p>Handloom Sector stands second to Coir Sector among the traditional industries of Kerala. As per the latest Handloom Census, Kerala has 11690 units employing 14679 weavers and allied workers. The industry is mainly concentrated in Thiruvananthapuram and Kannur districts and in some pockets/ clusters of Kozhikode, Palakkad, Thrissur, Ernakulam, Kollam and Kasaragod. Main problems of handloom industry are lack of adequate working capital, inadequate availability, increasing price of raw materials, high wage rates on alternative occupation, stiff competition from power loom cloth and low sales turnover.</p> <p>A value chain approach should be adopted to include all the stakeholders in the sector for a comprehensive development of the sector. Producer Organisations could be an effective tool to enable the weavers to realise value of the produce.</p>
3	Handicrafts	<p>The major handicrafts of Kerala are: horn carving, bell metal casting, screw pine weaving, coconut shell carving, cane works, straw picture making, bamboo and reed weaving, kora grass weaving etc.</p> <p>The Kerala State Handicrafts Apex Co-operative Society Ltd. (SURABHI), Artisans Development Corporation, Handicrafts Development Corporation and Bamboo Development Corporation are the major agencies engaged in the promotional efforts. The Handicrafts Development Corporation is procuring and marketing handicraft products by giving fair returns to the artisans through its 19 Kairali emporium, spread all over India. The artisans in the trades of pottery, copper, bronze, gold smithy, carpentry etc. are assisted by the Kerala Artisans Development Corporation (KADCO).</p>
4	Bamboo Industry	<p>The Kerala State Bamboo Corporation Ltd. and Kerala State Bamboo Mission are the State agencies looking after the development of bamboo sector in the state. Kerala State Bamboo Mission (KSBM) constituted in the year 2003 is designated as the Bamboo Development Agency (BDA) of the State for implementation of the various schemes of the National Bamboo Mission (NBM), under the Dept of Agriculture & Cooperation, Ministry of Agriculture and Farmers' Welfare, GoI. The interventions initiated by KSBM include promoting cultivation of bamboo, creation of new designs for innovative products in the handicrafts sector along with appropriate skill development, promotion of bamboo based modern industries supported by technology adaptation and development. KSBM and KSBC are jointly setting up a Bamboo Innovation Centre at the premises of KSBC, Angamaly, Ernakulam and are in</p>

		the process of development of Supply Chain of Treated Bamboo to the beneficiaries through the Depots of KSBC to ensure uninterrupted availability of the raw materials.
5	Construction sector	The immense potential this sector holds is due to the boom in construction of houses in rural/ urban areas. Units for construction related activities like brick kilns, stone crushing, mining for laterite stones etc. hold good scope. Industrial units for wood products, wall coatings, electrical accessories, plumbing, etc. can be supported. This sector needs to be developed in an organised way, as immense scope exists.
6	Information and Communication Technology	The availability of qualified and skilled graduates, lower salaries and lower employee attrition rates has helped the State's progress. Initiatives taken by successive governments to promote Kerala as an IT destination have been very fruitful. Immense scope exists for setting up of IT/ITES enterprises in the MSME sector in the state. The Kerala Perspective Plan 2030 is proposing that the state is to become a knowledge economy where ICT is the lynchpin. Techno Park at Thiruvananthapuram, Info Park at Kochi and Cyber Park at Kozhikode together lead the growth of IT sector in state. The state follows the hub and spoke model of development for IT sector and has info parks at Cherthala and Thrissur and Cyber Parks at Kannur and Kasaragod.
7	Tourism	Tourism is one of the few sectors where Kerala has clear competitive advantages, given its diverse geography in a short space ranging from the Western Ghats covered with dense forests to the backwaters to the Arabian sea. Tourism has been declared as an industry in Kerala. The " God's Own Country " slogan launched in 2000 has now attracted worldwide attention. The tourism policy 2012 advocates greater private investments in the sector and offers tremendous scope for new MSME enterprises to cater to the demands generated by the sector.
8	Rubber, PVA, PU footwear manufacturing	This has been one of the success stories of Kerala's MSME sector. Kozhikode district has emerged as a major centre in the manufacture of rubber- and PVC-based footwear with the state-of-the-art technology, value-added products and strong brands (Paragon, VKC). With huge national and international market, especially through West Asian countries, this sector offers tremendous growth potential.

Potential activities for MSME sector development in Kerala MSME activities with potential in the state

Sl. No.	Industry	Activity
1	Medicinal oil extraction /formulations manufacture	Globally, the demand for medicinal plant- based raw material is growing at the rate of 15-20 % annually, and by 2050 this demand is likely to grow to US\$ 5 trillion. In 2010-11, India's share of exports in herbal medicine was 1.00 % globally, as compared to that of China which had a share of 55%. Under this scenario and given the flora and fauna potential in Kerala and traditional knowledge base available, the state can make efforts to contribute towards global exports of medicinal plants.
2	Light Engineering	The innovation and experiments with new technology is the buzz word for success in the sector. This is a major feature of the Light engineering sector in the state. The availability of highly skilled workforce, suitable infrastructure and accessibility to a lucrative domestic market has assisted the sector to thrive in the state. Die casting, Automobile spares and coil springs, precision equipment, pollution control and energy saving devices, machine tool accessories, high vacuum pump, etc. are the main products.
3	Export oriented units/ Agro processing	Granite cutting, slabs, cashew shell liquid, coir products, handicrafts, canned sea foods, mushroom preparations, coconut products, Spices, flower based industries food and agro products and Ready to eat products

Initiatives of the Government of Kerala

Infra- structure Development Schemes: These schemes intend to promote development of infrastructure in the industrial parks, estates, Development Areas/Plots with quality infrastructure like roads, power, water, waste management etc. & develop new multi-storied industrial estates, industrial parks, common facility centres for clusters etc.

Entrepreneur Support Scheme (ESS): The scheme intends to provide extensive support to MSMEs and give one time support to entrepreneurs, with regard to special categories like women, SC/ST, etc., with more flexibility of operation and clear guidelines.

Capacity building programme: The scheme intends to promote Entrepreneurial/ industrial promotional activities and skill development training in Micro, Small and Medium Enterprises. Under the scheme, Government officers and entrepreneurs are provided training and capacity building initiatives.

The Kerala State Entrepreneur Development Mission (KSEDM) was set up by the State Government with the objective of training probable entrepreneurs in each Panchayat /Municipality/Corporation of the State. The state budget has given a lot of emphasis on Entrepreneurship *Development* with special incentives for Women Entrepreneurs and has provided for venture capital funding and incubation facilities.

Further, Government agencies like Kerala Bureau of Industrial Promotion (K- BIP), Kerala Small Industries Development Corporation (SIDCO), MSME Development Institute, Thrissur, Kerala Institute for Entrepreneurship Development (KIED), Kerala Academy for Skill Excellence (KASE) and Kerala institute for Labour and Employment (KILE) provide infrastructure and training and skill development support for MSME sector in the state.

Initiatives of NABARD

NABARD has been conducting promotional programmes with an objective to create replicable models, to generate and enhance opportunities for employment and income generation in rural areas in a sustainable, demonstrative and cost effective manner.

(i) Loan cum Grant Model for development of Off Farm: Based on the experience gained over the period of time and feedback from stakeholders, NABARD has reorganized the existing programmes into a “PROJECT APPROACH”. The focus is now to support on a project based approach with a combination of grant, loan and stakeholder /client contribution (margin money/equity). The basis for support depends on the nature of the project and activities within the project and which benefit rural, agricultural, weaker section and poor community directly or indirectly.

(ii) Exhibitions/fairs/melas - NABARD has been facilitating artisans, rural producers like SHG members, Farmers clubs etc. for participating in exhibitions/fairs/melas organised by Government and non-Government organisations held at district, State and national levels. Apart from establishing a direct linkage between the rural producers/artisans and the consumers, the initiative facilitates marketing the artistry to the consumers, add value to the rural produce, benefit directly from the market feedback obtained during the programme for better value realisation in future and sell ‘what market demands’.



(iii) Assistance to RSETIs: NABARD supports the capacity building and other initiatives of Rural Self Employment Training Institutes (RSETIs) aimed at creation of sustainable employment opportunities for the youth in our rural areas.

Issues for Action

- The “make in India” brand to be promoted as an umbrella brand for all sectors
- A sizeable number of SMEs in the manufacturing sector are located in developmental areas/parks and small industrial parks. Upgradation of infrastructure in these clusters needs to be undertaken
- Setting up of an “MSME Equity Participation Fund” for encouraging start-ups to be created by the State Industrial Development Corporation and State Financial Corporation
- Exemption for payment of EMD and security deposit and price preference to MSMEs to be extended for a period of 5 years.
- Organisation of Industrial Adalats regularly at State/District levels with a view to understanding the problems of MSMEs and settle pending issues.
- Facilitation of skilled workers to industrial units through employability centres under the labour and skills department.
- Investment subsidy to women entrepreneurs to take up entrepreneurship as a profession by treating these as thrust industries.
- Encouraging bio-technology, nanotechnology and life sciences which have tremendous potential
- Organizing garment based activities into clusters, providing design support, cluster brands, access to finance and establishing market linkages.
- Promotion of MSME sector through Stand up India Scheme.

There has been a steady increase in the ground level credit offtake to this sector. The credit flow to this sector during 2015-16, 2016-17 and 2017-18 stood at Rs.19277.38 crore, Rs.21,737.31 crore and Rs.31093.07 crore, respectively.

Credit Potential for 2019-20

Considering the infrastructure available, likely to be made available and based on the discussions with the line departments, etc., the district wise credit potential estimated for the year 2019-20 is given in the table below:

Sl. No.	Particulars	Amount (Rs. crore)
1	MSME - Working capital	15824.46
2	MSME - Investment credit	25265.71
	Total	41090.17

4.4.1 OTHERS (LOANS TO SHGS/JLGS/FPOS ETC.)

Introduction

In terms of revised RBI guidelines on PSL, loans not exceeding Rs.50,000 per borrower provided directly by banks to individuals and their SHG/JLG, provided the individual borrower’s household annual income in rural areas does not exceed Rs.100,000 and for non-rural areas it does not exceed Rs.1,60,000, loans to distressed persons to prepay their debt to non-institutional lenders and overdrafts extended by banks up to Rs.5,000 under PMJDY besides loans sanctioned to State Sponsored Organisations for SC/ ST for the specific purpose of purchase and supply of inputs and/or the marketing of the outputs of the beneficiaries of these organisations are covered under the sector “Others”.

Status of Micro Credit in Kerala

Self-Help Group (SHG)-Bank Linkage Programme

As on March 2018, around 1.74 lakh SHGs have been credit linked in Kerala with an outstanding bank loan of Rs.3723.36 crore. The comparative position of Kerala vis-a-vis the all India Position is given below;

Status of SHG Bank Linkage Programme as on 31 March 2018

	Performance under SHG (As on 31 March 2018)	All India		Kerala	
		Physical	Financial (₹ in Lakh)	Physical	Financial (₹ in Lakh)
I	SHGs saving linked with Banks				
	Commercial Banks	4633712	1166422.45	191995	36479.22
	RRBs	2807744	580735.20	61021	11938.00
	Cooperative Banks	1302981	212053.87	43273	7812.52
	Total	8744437	1959211.52	296289	56229.74
II	Credit disbursed to SHGs during 2017-18				
	Commercial Banks	1272886	2870762.37	72356	220007.92
	RRBs	782563	1511933.55	8872	29430.00
	Cooperative Banks	205683	335891.69	9540	23417.41
	Total	2261132	4718587.61	90768	272855.33
III	Bank loan outstanding against as on 31.03.2018				
	Commercial Banks	2904086	4874805.16	144555	310883.21
	RRBs	1658221	2273864.21	16347	32337.00
	Cooperative Banks	458051	411175.75	12930	29115.30
	Total	5020358	7559845.12	173832	372335.51

Source: – Status of Microfinance in India 2017-18

Issues

The number of SHGs formed in the state is much more than the number of SHGs that can be formed based on the estimates of population/ households of the State leading to the conclusion that SHGs include regrouping of members, multiple membership, variations in the number of members in each group, etc. Multiple membership is a cause for concern as the multiple loans availed will increase indebtedness of the individual thus affecting the repayment to the group/ institutions. This makes the operation of a credit bureau imperative. Till that time, the close monitoring of credit linkage is crucial

With the SHG movement reaching critical stage, the graduation of SHGs to income generating micro enterprises is the next logical step. Quantum of credit requirement per SHG will be much higher for undertaking such activities.

Farmers' Club

The Farmers Clubs are envisaged as peer learning groups facilitating transfer of technology, knowledge and act as an agency to provide forward and backward linkages. Farmers' Clubs promoted by Banks, NGOs, KVKs, etc. are supported by NABARD with financial assistance for maintenance of clubs and for other activities viz., exposure visits, training programmes, etc.

These clubs are expected to federate themselves into umbrella organizations and graduate to play the role of Producer Organizations. Towards this end, NABARD & Government are supporting formation of Federation of Farmers 'Clubs and Producer Organizations.

In Kerala, there are about 2700 farmers clubs and 10 federations of farmer clubs. These clubs are provided assistance for capacity building of members like, exposure visits, skill based training etc.

Loans to FPOs

Considering the need for specific and focused attention towards meeting the growing credit needs of FPOs, NABKISAN Financed Ltd, a subsidiary of NABARD as also other subsidiaries were given special responsibility to support credit needs of FPOs on affordable terms. Consequently, it was decided to discontinue providing direct loans to POs by NABARD forthwith. However, NABARD will continue to provide grant support towards accompanying measures to POs/ PACS/ PCARDBs so as to ensure better utilization of loan extended by the lending agencies and achieve long term sustainability.



Kerala RO has sanctioned 120 FPOs (including 2 at Lakshadweep) under PRODUCE fund set up in NABARD by the GoI with a total membership of more than 50000 shareholders. These FPOs have mobilised share capital of nearly 17.00 cr. To give a fillip, the guidelines regarding assistance to the FPOs have been recently revised and the quantum NABARD grant assistance to FPOs increased to Rs.11.440 lakh over a period of 3 years from the earlier limit of Rs.9.06 lakh. Further, the period of assistance is also made extendable upto 5 years on fulfilling certain eligibility criteria. Since Produce Fund assistance is limited to formation and nurturing of the FPOs and that too, for a limited period, FPOs need working capital assistance to commence and sustain their business operations. Ministry of Agriculture and Farmers Welfare, Govt of India vide letter dated 22 October 2018 has advised that financing of FPOs by banks may be made a standing issue in the meetings of SLBC/DLBC so that all aspects of credit requirement of FPCs by the banking system is regularly monitored and reviewed. A few banks have formed tailor made products to suit the requirements of Farmer Producer Organisations which may be replicated by other banks also.

Livelihood and Enterprise Development Programme (LEDP)

With a view to create sustainable livelihoods among SHG members and to create maximum impact of skill upgradation with hand holding and credit linkages, the Livelihood and Enterprise Development Programme (LEDP) has been launched in December 2015. These programmes are implemented in small batches for a maximum of 150 SHG members in a cluster of contiguous villages on a project basis covering 15 to 30 SHGs in a cluster of contiguous villages. The programme covers agricultural & allied activities as well as rural nonfarm sector activities.

Issues related to micro finance

Some of the major issues related to implementation of SHG-Bank Linkage Programme in the State are weak reporting system about SHG linkage by banks, dual membership in case of groups promoted by other agencies/NGOs, since majority of the women is already members of Kudumbashree groups, poor monitoring, follow up and handholding by some of the NGOs, leading to instances of poor recovery.

Road map for the future

Though the overall coverage of rural households appears to be good, there could be pockets where the coverage is still inadequate. Further, consequent on the introduction of activity based JLGs, many SHG groups have become dormant. Therefore, the focus of SHG bank linkage programme in the district should be to ensure coverage of entire rural households in all the pockets and also to ensure credit linkage of all the existing groups. The roadmap for SHG-BLP may focus on the following areas:

- i. To identify pockets where coverage of rural households is inadequate and initiate steps to form groups in those areas, especially coastal belts
- ii. To credit link all the eligible groups
- iii. To revive SHGs which have become dormant due to various factors.
- iv. Training and capacity building of stake holders.
- v. Convergence with Government programmes like NRLM/ NULM to maximize the benefits to SHG members.
- vi. To provide MEDP training to matured SHG groups
- vii. To leverage Information Technology to improve quality of SHG operations.
- viii. Financial literacy drive at SHG level to eliminate over-indebtedness.

The JLG mode of financing serves as collateral substitute for loans provided to the small, marginal, tenant farmers, oral lessees, share croppers, etc. As already mentioned, the SHG Bank Linkage Programme has almost reached a point of saturation. Financing through JLG is the focus area of the year.

National Rural Livelihood Mission (NRLM) - Aajeevika

The Ministry of Rural Development, Government of India has launched National Rural Livelihood Mission (NRLM) – ‘Aajeevika’ by restructuring and replacing the existing Swarnajayanti Gram Swarozgar Yojana (SGSY) with effect from 01 April 2013. The beneficiaries of NRLM will be SHGs, Federation of SHG at village/ cluster level. The support from NRLM will include all round capacity building of the SHGs, SHG Federations, livelihood organisations, skill development, etc. Support under the scheme is available to all SHGs formed by all NGOs, Banks, PACS, etc.

The various financial assistance available under NRLM are Interest Subvention for loans up to Rs.3.00 lakh @7%, Revolving Fund assistance of Rs.10,000 to Rs.15,000 & Community Investment Support Fund to be used, by the Federations, to advance loans to the SHGs and/or to undertake the common/collective socioeconomic activities. No collateral and no margin will be charged upto Rs.10.00 lakh limit to the SHGs. No lien shall be marked against savings bank account of SHGs and no deposits shall be insisted while sanctioning loans.

Suggested Action Points

State Government

- Encourage SHGs with long history of operations and good track record to graduate to entrepreneurial / livelihood activities like group farming, vegetable cultivation with the assistance of bank credit.
- Govt. / SRLM may ensure that the Interest subsidy under NRLM is made available to all NRLM complaint women SHGs.
- Extend Stamp duty waiver for loans availed by SHGs
- Encourage JLGs with fiscal incentives and support to their ventures
- Extend interest subvention to JLGs also in the lines of NHGs

Banks

- Financing JLGs / SHGs
- Design new products and services appropriate to clientele
- Mapping of SHGs to their promoting institutions in the CBS software as this would facilitate identifying SHGs and SHPIs with history of bad recovery



E-Shakti

NABARD had embarked on a project “E-Shakti” for digitisation of SHGs which was launched on 15 March 2015. The project aims to bring SHG members under the fold of Financial Inclusion Agenda thereby helping them access wider range of financial services, increase bankers’ comfort in credit appraisal and linkages of SHGs through digitisation of SHG accounts among host of others.

Results obtained from the two districts where the pilot project was taken up viz. Ramgarh (Jharkhand) and Dhule (Maharashtra) are encouraging. Hence, it had been decided at the highest level to take up more districts.

In the Phase II of the project 23 districts across the country have been taken for digitisation of SHGs. E-Shakti, on a pilot basis, implemented in Kasaragod District and in the Phase - III is being implemented in four more districts in Kerala- Kannur, Malappuram, Idukki and Kottayam. Further, extension of the project to additional 150 districts, pan India is on the anvil and in Kerala, four districts viz., Thrissur, Palakkad, Wayanad and Alappuzha are being considered.

4.5 EXPORT CREDIT

Introduction

Kerala, which is the Spices Garden of India, is home to all major items of export like Pepper, Cardamom, Ginger, Turmeric, Curry powder, Spice oils and Oleoresins, Vanilla, Nutmeg and mace. Marine products lead the list of food products exported from the State, followed by spice products & cashew. Two thirds of Kerala’s export income comes from processed food, exports of food products from Kerala account for approximately 15 to 20% of the India’s export under this category.



As the commercial gateway of Kerala, external trade operations in the State is mainly conducted through Cochin Port. Important items of trade include pepper, cashew, coir and coir products, tea, cardamom, ginger, spices and spices oil and marine products. The details of export of commodities from the state from 2013-14 to 2016-17 is given in the following table. As may be observed there from export of coir and coir products, sea foods, coffee showed an increasing trend while the export of cashew kernels and tea showed a decline.

Export of Commodities through Cochin Port during 2013-14 to 2016-17

(Quantity in M.T, Value in Rs. crore)

Commodity	2013-14		2014-15		2015-16		2016-17
	Qty	Value	Qty	Value	Qty	Value	Qty
Tea	96681	1371.79	90348	1236.19	67103	987.05	64289
Cashew Kernels	64897	2657.14	67273	2754.16	50054	1568.07	38668
Sea Foods	222794	3999.96	185922	3337.30	139980	3019.64	162990
Coir Products	124116	385.37	125523	389.12	124305	374.03	211177
Spices	95540	655.19	84388	582.28	49706	315.91	23858
Coffee	75631	872.03	65216	1121.05	54720	858.16	55874
Mis POL	3570686	14341.5	3439808	13662.1	3428249	19316.15	4202191
	4250345	24283	4058478	23082.2	3914117	26439.01	4759060

Source: Economic Review 2017-18

Export of Marine Products

Kerala with its vast coast line of 580 kms is the major marine fisheries exporter of the country. There is huge demand for marine products of Kerala, such as frozen fish, shrimps, and squids in the international market. Marine products exports from Kerala registered an increase both in quantity and value, in 2016-17. Quantity enhanced from 1.49 lakh MT in 2015-16 to 1.59 lakh MT in 2016-17 and value from Rs.4,644.42 crore to Rs.5,008.54 crore for the same period. The share of Kerala in Indian exports of marine products declined from 15.77 per cent to 14.02 per cent in case of quantity and from 15.27 per cent to 13.23 per cent for value during the period under review. The major export items of marine products from the state are frozen shrimp, frozen fish, frozen cuttle fish, frozen squid, dried items, live items and chilled items.

Export Trend of Marine Products

Year	India		Kerala		Kerala's share in percent	
	Quantity (Tonnes)	Value (Rs.lakh)	Quantity (Tonnes)	Value (Rs.lakh)	Quantity	Value
2010-11	813091	1290147	124615	200210	15.33	15.52
2011-12	862021	1659723	155714	298833	18.06	18.00
2012-13	928215	1885626	166399	343585	17.93	18.22
2013-14	983756	3021326	165698	470636	16.84	15.58
2014-15	1051243	3344161	166754	516608	15.86	15.45
2015-16	945892	3042083	149138	464442	15.77	15.27
2016-17	1134948	3787090	159141	500854	14.02	13.23

Source: Marine Products Export Development Agency (MPEDA)

The new Foreign Trade Policy for 2015-2020 announced by the GoI on 1st April 2015 aims at increasing India's export of merchandise and services from \$466 billion in 2013-14 to around \$900 billion by 2019-20 and to raise India's share in world exports from 2% to 3.5%. To achieve this milestone, the FTP aims to provide a stable and sustainable policy environment and link with other initiatives of the Government such as 'Make in India', 'Digital India' and 'Skills India'.



While the infrastructure associated with export is taken care of by the Government, banks play an important role in providing the much needed credit for financing export. Lending by banks for export purposes is an eligible item under priority sector definition of RBI. Financing for export purposes, is broadly classified under Pre-shipment and Post shipment credit facilities. These are in turn financed either through Indian Rupee or through foreign currency. As per the Priority Sector norms of RBI, incremental export credit over the corresponding date of the preceding year, up to 2 percent of ANBC or credit equivalent amount of off-balance sheet exposure, whichever is higher, subject to a sanctioned limit up to Rs.25 crore per borrower to units having turnover of upto Rs.100 crore is eligible to be covered under Priority sector.

The GoI has approved an interest equalisation scheme that would allow exporters, mostly in the labour-intensive and small and medium sectors, to avail of loans from banks at a 3 per cent lower rate. The interest subvention scheme will be applicable from April 1, 2015. The financial implication of the scheme is estimated to be in the range of Rs.2,500 crore to Rs.2,700 crore per year. The scheme would be available to all exports of micro small and medium enterprises (MSME) and 416 other items spread across 25 sectors. The sectors covered are mostly labour intensive and include agriculture/food items, auto-components, bicycle parts, handicrafts, electrical engineering items and machinery, telecom equipment, handmade carpet (including silk), handloom products, coir items, jute, readymade garments and made ups, toys, sports goods, paper and stationary, leather goods and ceramics. The scheme, however, will not be available for merchant exporters.

The data on GLC flow under export credit is presently not being reported by SLBC. As per the estimates available the total outstanding credit by banks in Kerala State under export credit as on 31 March 2015, stood at Rs.48974.79 lakh. Among the districts Ernakulam, Kollam and Kozhikode had the maximum share in GLC.

Availability of Infrastructure and interventions required

- The factors favoring export in Kerala are an all-weather sea port at Kochi, 3 international airports, a proposed port at Vizhinjam, good connectivity by rail, road, water etc., proximity to trans national trade corridor, high literacy rate and sense of hygiene and good processing skills of labour.
- The major organizations available for furthering the cause of export in Kerala are Marine Products Export Dev. Authority [Kochi], Cashew Export Promotion Council [Kollam], Coir Board, Tea Auction facility, SEZ for Export promotion, Industrial Parks set up by Govt., Food Park at Ernakulam & Pathanamthitta, Sea Food Park at Alappuzha, Spices Park at Idukki etc.
- Some of the important items produced in the state and exported through Kochi sea port are: Kottayam-Rubber; Idukki-Spices, Tea, Coffee; Pathanamthitta-Spices; Alappuzha-Coir, Marine; Kollam-Cashew; Thrissur-Gold; Palakkad-Rice; Kozhikode-Footwear; Wayanad-Spices, Tea, Coffee.
- The countries to which the major exports from Kerala through the ports and airports in Kerala are: *Kochi sea port*: USA (30%), Nigeria, Indonesia, Hungary, UAE; *Kochi Airport*: UAE (22%), Maldives, Qatar, Oman, China; *TVM Airport*: UAE, Maldives, Qatar, China, *Kozhikode Airport*: Qatar (30%) UAE.

Prospects: The new port coming up at Vizhinjam will provide more openings to international trade, cashew exports may shift from Kochi and marine exports will get a boost. The Development of Bepore port will help trade to Gulf and Sri Lanka and export of food items, masalas, footwear, marine etc. will get a boost. The proposal of Kerala government to set up commodity specific agriculture processing parks will give further boost to agro processing and its export.



Institutions like Spices Board, Marine Products Export Development Agency, Cashew Export Promotion Council etc provide valuable services to farmers and exporters. Cochin Special Economic Zone has units involved in food processing for export. KINFRA, the State owned infrastructure provider, is in the processes setting up of export promotion parks with the support of GoI scheme, Assistance to State for Infrastructure Development for Exports (ASIDE).

Issues: Trade is mostly to gulf countries and cost of cargo remains high. Also, the dependency is high on the NRI community, nonbanking channels and relatives/agents.

Opportunities: The opportunities lie in contract farming for bio-agri products, floriculture, cut flowers, spices and spices oils and revival of sea food, cashew and coir.

Credit Potential for 2019-20

Considering the prevailing situation and past trends, a total potential of **Rs.1215.21 crore** has been estimated under the sector.

4.6 EDUCATION LOAN

Introduction

Education is central to the human resources development and empowerment in any country. Education and development are closely related, as education provides inputs for economic growth among which knowledge is an important one. Modern economic

growth, as seen in recent years, is driven by knowledge. National and State level policies are framed to ensure that quality education is accessible to the masses through appropriate public and private sector initiatives as investment in education is investing in future of the country. For the economy to reach a higher growth trajectory there is a need for work force with higher level of knowledge and skills. While government endeavour to provide primary education to all on a universal basis, public funding of higher education is not considered feasible. Cost of higher education has been on the rise in recent times which has resulted in a high demand for institutional funding of higher education.

The general education levels of the population are high in Kerala, compared to the all-India levels. Per 1000 persons, 545 men and 509 women are educated up-to middle-school, comprising the largest proportion in terms of education levels. The next highest proportion is of secondary and higher secondary school persons with 277 men and 271 women (per 1000). 92 men and 97 women were estimated to be graduates and above, only slightly higher than the all-India estimation for men at 90 (per 1000). Kerala has a total of 17 universities and 1062 colleges. There are 34 colleges catering to per lakh students higher than the national average of 25 per lakh students. The Gross Enrolment Ratio (GER) in higher education (18-23 years age group) is 22.9, slightly higher than the national average of 21.1. The GER for females (26.9) is significantly higher than GER for males (18.9).

The education loan portfolio of banks in the state which had shown impressive growth during recent years is showing negative growth on account of rising NPA. Total outstanding under education loan during last three years is as follows:

Education loan outstanding (Rs.crore)

	March 2016	March 2017	March 2018
All agencies	9586	9282	10092

The State Education Policy 2012 layout the vision for next 10 years as “Expansion with Excellence and Equity” the major milestones set are:

- The State should establish separate State Universities for Medical Education including Nursing and Para Medical, Engineering Education, Dental Science, Law, Teacher Education and Pharmacy and for Traditional Medicine systems.
- New colleges to be established in five backward districts of the State
- One Women’s University to be established in the State.
- State University for Distance Education to be established for promoting Distance Education.

Keeping in sight the importance and the modern day requirements of education, the 13th Five-Year Plan has marked it as one of the main thrust areas for State interventions. Education is one of the four Missions initiated in 2016. Funds have been earmarked for strengthening the Education Mission, “Pothu Vidyabhyasa Samrakshana Yajnam” to meet the changing requirements of time and to upgrade classrooms and curriculum. In order to address the relevant issues in three sectors of education – school, higher, and technical education – and to formulate focussed projects for implementation during 13th Five-Year Plan, State Planning Board had constituted a Working Group.

Initiatives of GoI, GoK etc.

Central Scheme To Provide Interest Subsidy (CSIS) On Education Loan:

The scheme provides full interest subsidy during the period of moratorium i.e., Course Period plus one year or six months after



getting job, whichever is earlier, on loans taken by students belonging to Economically Weaker Sections (annual gross parental family income upper limit of Rs.4.5 lakh per year) from scheduled banks under the Educational Loan scheme of the Indian Banks' Association, for pursuing any of the approved courses of studies in technical and professional streams, from recognised institutions in India. The scheme is applicable to all education loans taken after 01.04.2009.

Govt of Kerala scheme

Education loan Repayment Support Scheme: The scheme provides government support to those who find it extremely difficult to repay education loans even after completion of the course. The support for repayment is available to standard loans and NPA loans sanctioned on or before 31 March 2016. The loan amounts ranging from Rs.4 lakh to Rs.9 lakhs are eligible under the scheme subsidy support ranging from 40% to 60% towards principal repayment is available.

SLBC, Kerala in consultation with Government of Kerala have issued common guidelines norms applicable to all banks for granting education loans to management quota seats and outside state admissions.

Credit Guarantee Fund Scheme for Education Loans (CGFSEL)

Ministry of Human Resources Development has launched the above scheme for educational loans vide notification in the Gazette of India on 19 Sept 2015. The scheme envisages extending guarantee against default in repayment of educational loans under IBA Model Education Scheme with limits up to Rs.7.50 lakh.

The salient features of the scheme are as under:

- Education Loan should have been sanctioned on or after the Date of Notification i.e., September 16, 2015.
- Guarantee cover can be obtained on the Outstanding Loan Amount i.e. guarantee can be obtained only after full or partial disbursement of the loan.
- Interest charged to borrower by MLI should not be more than 2% over the Base Rate/ MCLR.
- Loan account should be a Standard Account at the time of applying for a guarantee.
- The borrower loan account is not overdue as on Material Date.
- The borrower shall be an Indian national with minimum educational qualification of HSC
- The borrower should have secured admission to a higher education course in recognized institutions in India or Abroad.
- Courses Eligible as per IBA Model Education Loan Scheme for perusing Higher Education in India/ Abroad circulated by IBA.
- No Collateral security or third party/ies guarantee should be attached with the Loan.
- No Additional cover on Education Loan by Govt./ General Insurer/ Any person or association of persons carrying on the business of insurance, guarantee or indemnity.
- On the Material Date, the Credit Facility has not wholly or partly been utilized for adjustment of any bad or doubtful debts without obtaining prior consent in this regard from NCGTC.

Credit Guarantee Fund Scheme for Skill Development (CGFSSD)

Ministry of Skill Development and Entrepreneurship has launched the above scheme for skill development loans vide notification in the Gazette of India on 20 November 2015. The scheme envisages extending guarantee against default in repayment of Vocational Education Loans with limits up to Rs.1.50 lakh extended without any collateral security and third party guarantee.

The salient features of the scheme are as follows:

- Skill development Loan should have been sanctioned on or after date July 15, 2015
- Amount of loan sanctioned should range from Rs.5000.00 to Rs.150000.00

- Guarantee cover can be obtained on the Outstanding Loan Amount (subject to Sanctioned Amount) i.e. guarantee can be obtained only after full or partial disbursement of the loan.
- Interest charged should not be more than 1.5% over the Base Rate / MCLR *
- Loan account should be a Standard Account at the time of applying for a guarantee
- The borrower loan account is not overdue as on Material Date
- Amount of First or cumulative disbursement shall not be more than Sanction Amount
- The Guarantee Fees charged on the Credit Guarantee Cover should be absorbed by the MLI
- The borrower shall be an Indian National with minimum qualification as prescribed in the National Skill Qualification Framework (NSQF).
- Eligible Course would be as per 'Skill Loan Scheme' circulated by IBA
- No Collateral security or third party/ies guarantee should be attached with the Loan
- No Additional cover on Skill Loan by Govt./ General Insurer/ Any person or association of persons carrying on the business of insurance, guarantee or indemnity
- On the Material Date, the Credit Facility has not wholly or partly been utilized for adjustment of any bad or doubtful debts without obtaining prior consent in this regard from NCGTC

Issues

High NPA: The Non-performing loans under the sector continues to be high.

Negative growth in fresh loan disbursement: The rising NPA levels has effected that banker's confidence and this is reflected in the negative growth in the sanction of fresh education loan in the state.

Credit Potential for 2019-20

Considering the prevailing situation and past trends, a total potential of **Rs.5,702.89 crore** has been estimated under the sector.

4.7 HOUSING

Introduction

Housing is an important sector as it has a direct impact on employment generation, GDP growth and consumption pattern in the economy. Housing related activities in the country like construction, renovation, maintenance and those related to trading, financing, mortgage banks, real estate agents, appraisers, movers and notaries, are estimated to account between 5-10 per cent of GDP. In India, housing finance market is still in its nascent stage compared to other countries. The outstanding amount of housing finance from all sources accounts for less than 8 per cent of GDP when compared with 12 per cent in China, 29 per cent in Malaysia, 46 per cent in Spain and 80 per cent in the US.

As per census 2011, the total number of houses in the state is 1.12 crore of which 58.57 lakh are in rural areas and 53.60 lakh are in urban areas. The overall housing availability is better in Kerala compared to all India average. The housing shortage in Kerala is estimated at 2.64 lakh houses.

The credit flow to the sector has shown steady growth over the years.



Growth in Housing loan—trend

(Rs.crore)

March 2012	March 2013	March 2014	March 2015	March 2016	March 2017
18615	21832	22697	25121	27379	30530
	17%	4%	11%	9%	12%

Source: SLBC [data excluding Cooperative Banks]

Credit flow under Housing in Kerala -2018

(Rs.lakh)

Bank	Direct Loan		Indirect loan		Total	
	No.of a/cs	Amt	No.of a/cs	Amt	No.of a/cs	Amt
Public CBs	358517	2576034	4	6	358521	2576040
Private CBs	58283	393276	393	5194	58676	398470
RRB	51285	243578	0	0	51285	243578
Coops	158313	333598	79933	431240	238246	764838
Total banking sector	626404	3546490	80330	436440	706734	3982930

Source: SLBC

As per latest priority sector norms:

- The loans to individual's upto a limit of Rs.28.00 lakh in metropolitan areas and loans upto Rs.20.00 lakh in other areas for purchase / construction of houses with a total unit cost of Rs.35.00 lakh and Rs.25.00 lakh are included.
- The loans for repairs of dwelling unit's upto Rs.5.00 lakh and Rs.2.00 lakh in metropolitan and other areas.
- Bank loans upto Rs.10.00 lakh for slum clearance/ rehabilitation projects of government agencies.

Housing, being the very basic requirement that holds the key to accelerate social development in many ways, the Government of Kerala has launched the LIFE Mission. LIFE (Livelihood Inclusion and Financial Empowerment) envisages a comprehensive housing scheme for all the landless and homeless in the State. The target of the mission is to provide safe housing to nearly 4.30 lakhs of homeless in the State within a period of 5 years.

The major recommendations of the Working Group on Housing Sector for the 13th Five-Year Plan highlights:

- Habitat to be considered as a wholesome product including infrastructure (physical and social) and environment that includes provision for sufficient green open spaces. Promote habitat culture and habitat literacy in a campaign mode.
- Propagate cost effective and environment friendly approaches through the use of local building materials and appropriate alternate technologies.
- Incremental housing to facilitate upward mobilisation of beneficiaries.
- The design of the housing should take into account location, climate, size and topography of the plot, occupational needs, socio-cultural requirements etc.
- Provide core houses to the most vulnerable sections - destitute, differently abled, aged, chronically ill, women headed households and so on - with provision for future development.
- Facilitate the beneficiaries to construct affordable houses with financial and technological support.
- Specific plans to provide housing for migrant labourers and plantation workers.
- Integrate housing programmes with training and skill up-gradation programmes thereby ensuring beneficiary participation and in turn providing livelihood opportunities to them.

- Use IT tools and services of banking institutions for improving the governance, management and monitoring of housing schemes for the weaker sections.
- Create a housing fund at each LSG level.
- Promote and strengthen people centered NGO's working in the shelter sector to serve as a link between end beneficiaries and government.

Availability of Infrastructure, critical gaps & interventions required

- Central Government has launched a comprehensive mission "Housing for All by 2022" Pradhan Mantri Awas Yojan. The mission seeks to address the housing requirement of urban poor including slum dwellers through 04 programme verticals. A central grant of Rs.1 lakh to Rs.2.3 lakh per house by way of a 6.5 percent interest subvention scheme is proposed under the scheme.
- State government is implementing "EMS Housing Scheme" that encompasses various other schemes. Some of these are: 'Bhavanashree' which is a loan linked scheme under the scheme, families having a two years membership of Neighbourhood Groups and having at least 1.5 cents of land are eligible. A subsidy of Rs.10000 is provided with a loan from commercial banks upto Rs.50,000 with a repayment period of ten years. Under the housing scheme of SC Department Rs.2 lakh assistance is provided to each BPL SC family. Similarly, under the housing Scheme of ST Department, an assistance of Rs.1.25 lakh is provided to eligible ST families. The Department of Fisheries also provides housing assistance of Rs.50,000.00 to their target group.
- To supplement IAY grant assistance, state government is providing additional funds for construction of IAY houses over and above the state share of 25% of the grant.

NABARD initiatives on Rural Housing

'The Working Group on Rural Housing', constituted by Planning Commission has estimated the housing shortage in rural India at 4 crore by the end of the 12th Plan period. Further, as per KPMG Report on 'Decoding Housing for All by 2022', the total shortage for rural housing is estimated at 6.4-6.5 crore by the year 2022.

Recognizing the importance of housing in rural areas, NABARD had made refinance for rural housing as an eligible activity in the year 2001-02 under the sub-segment of 'Rural Non-farm Sector Refinance' products. Under the Rural Housing Scheme, NABARD extends refinance to banks for provision of loans to individuals/cooperative housing societies.

Given the diversity of the socio economic and climatic conditions in the country, a 'one size fits all' approach may not be the solution. It is essential to have different products for different segments of society / institutions. NABARD had therefore, introduced 3 new products for the Cooperatives besides the existing refinance product. These are as under:

1. Direct Loans for Rural Housing (loan only – without grant)
2. Direct Loans for Rural Housing (Loan-cum-Grant assistance)
3. Composite Loans for Rural Housing along with Income Generating Activities.

Eligible Institutions

- Scheduled State Co-operative Banks | District Central Co-operative Banks
- Primary Agricultural Cooperative Societies | Primary Urban Cooperative Banks

Action Point for Government department, banks and other agencies

- **Emphasis on Environmental Conservation and Disaster Resistance:** The use of locally available materials, installation of rainwater harvesting units and eco-friendly measures should be encouraged. Incorporation of disaster resistant designs in house construction should be made compulsory.
- **Rural Risk Fund:** Presently, the PLIs have high risk perception for lending to the poor. The risk fund will provide credit guarantee cover for loans upto Rs.1 lakh taken by the BPLs. However, for effective operationalization of such a fund, the Ministry of Rural Development could consider providing an initial corpus of Rs.1000 crore to NHB to set up such a fund to be exclusively used for providing cover to PLIs for small loans say upto Rs.1 lakh taken by the poor where the primary security i.e., valid collateral e.g., title deed is not available.
- **Mortgage Credit Guarantee:** This would cover all loans given by PLIs i.e., in urban and rural areas with loans above Rs.1 lakh. NHB with the other institutions will bring in the required corpus of initial funds and PLIs will be paying premium for the credit cover which may be shared between PLI and the ultimate borrowers Mortgage credit guarantee for rural micro-habitat finance for loans upto Rs.1 lakh could be borne by the lending institution itself as a onetime premium.

Credit Potential for 2019-20

Considering the prevailing situation and past trends, a **total potential of Rs.22660.54 crore** has been estimated under the sector.

4.8 INFRASTRUCTURE

SOCIAL INFRASTRUCTURE INVOLVING BANK CREDIT

4.8.1 Introduction

Though all types of infrastructure development are aimed at improving the standard of living of the people, there are certain types of investment which have a direct bearing on the social lives of the people, especially in the rural areas. Availability of clean drinking water, adequate educational and health facilities, efficient waste management facility, old age homes, palliative care centres and sanitation facilities etc., are examples of such sectors, which can be termed as Social Infrastructure and these defines the quality of life in a society. The better the availability the deeper the impact on the population.

Recent introduction of schemes like “Swachh Bharat” etc. has reemphasized the need for better hygiene in the community. Government of India has also introduced various other schemes for improving education facilities, skill development, training etc., which in the long run will improve the GDP of the region.

Though investments for this sector has been the prerogative of the Government, the gap between the demand and supply of this infrastructure requirement has been widening over the years. As social Infrastructure sector has to be developed on a priority basis, Governments have given specific thrust to these sectors and to attract investments from the banking sector, credit to activities like school and health care Infrastructure, drinking water and sanitation infrastructure etc., in tier II to tier VI centres is now considered as part of priority sector lending. This chapter attempts to make an estimate of the potential under social infrastructure sector that can be financed through bank credit.

Credit potential for 2019-20

While assessing a gap of health institutions at current level of population, with a view to reach up to the state’s average, there is potential for more hospitals as the incidence of illness is very common. The facilities in the existing Primary Health Centres need to be

improved. There is a growing demand for old age homes and palliative care centres with the increased incidences of cancer and other life style diseases.

Solid Waste management requires urgent attention which needs to be addressed at the level of residential associations/ flat owners. Kerala, being an agricultural dominated state, has tremendous potential for developing **Farm Tourism** in a big way without much additional investment. Developing rural markets at Panchayat / block level should be the focus to avoid distress sale and to ensure supply of safe food products to the consumers. ‘Going Green’ by installing solar panels could be a sustainable option for the corporates, which could be replicable models to other institutions.

Based on the available infrastructure and gaps, the district-wise potential available for the social infrastructure for the year 2019-20 are estimated at Rs.375.91 crore. The district wise critical infrastructure requirement is given in Annexure III.

Suggested Action Points

- Promotion of para medical institutes may ensure trained and skilled manpower for the new health institutions
- The Village Water and Sanitation Committees may be formed and their capacity building may be done.
- Skill development of rural youths in non-farm employment opportunities in rural area, has to be taken up in mission mode to bridge inequalities in access of education between urban/rural areas and people dependent on agriculture/industry and services.
- Convergence between drinking water supply and sanitation need to be strengthened.

4.8.2 RENEWABLE ENERGY

Introduction

Renewable energy is defined as the energy that comes from resources which are naturally replenished on a human timescale such as sunlight, wind, rain, tides, waves, biomass and geothermal heat. Due to depletion of fossil fuels through prolonged use, the use of renewable energy sources have become important for meeting the energy needs of the future. Renewable energy can replace conventional energy in four areas: electricity generation, air and water heating/ cooling, motor fuels and rural (off-grid energy services). Thermal energy is the predominant source of energy in India and the category-wise contribution of various sectors in the total installed capacity/ energy generated in India as on March 2017 is given in the table below:

Progress of Electricity Supply (Installed/Energy generated)

Source	Hydro	Thermal + RES	Nuclear	Non-Utilities	Total
Installed Capacity (Thousand MW)					
Installed capacity	44.5	275.6	6.8	50.3 (estimated)	377.1
Percentage	12%	73%	2%	13%	100%
Energy Generated (Billion BWH)					
Installed capacity	122.4	1076.1	37.9	197 (estimated)	1433.4
Percentage	9%	75%	3%	14%	100%

Source: Economic Survey 2017-19, GoI

Status in Kerala

The major renewable energy sources relevant to Kerala are solar energy, wind energy, hydel energy [mini hydel projects from 101 KW to 2000 KW and small hydel projects from 2001 KW to 25 MW], bio-energy and wave energy. Biogas is one of the efficient

non-conventional energy sources, which can be profitably harnessed to meet the domestic fuel requirement and to supplement rich organic manure for farm operations.

The total installed capacity of power in the state as on March 2017 is 4998.94 MW. Hydel contributed the major share of 2416 MW (48.3%) to total and 1881.5 MW (37.6%) was contributed by thermal projects including National Thermal Power Corporation (NTPC) at Kayamkulam (Kerala's dedicated thermal station) and 338.72 MW from other renewable energy sources.

Kerala – fully electrified State

Kerala is always a role model for the rest of the States in the country when it comes to development and progress. Now Kerala has achieved a rare fete by providing electricity to all households. **Kerala was declared as a fully electrified State on May 29, 2017** by providing connections to over 1.5 lakh applicants under the ambitious Total Electrification Scheme.

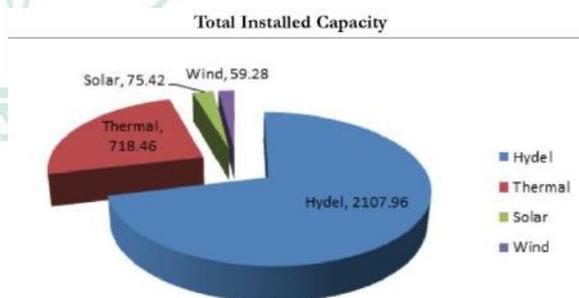
Kerala continues to lag behind the rest of the southern States in renewable energy generation. The percentage share of renewable energy excluding hydroelectric from the total of central, state and private installed capacity shows that Tamil Nadu has the highest share (36.58%) followed by Karnataka (35.0%), Andhra Pradesh (27.6%) Telangana (13.4%) and Kerala at 6.8%.

A Cooperative Success story

The PACS, Chengalam, Kottayam district has earned the distinction of becoming the first cooperative bank in Kerala to have met 100% power requirements from solar power production. The PACS has implemented a solar project with assistance from NABARD under PACS as MSC programme. The PACS have created solar roof top panel of about 1500 sq.ft. Presently the PACS has connected load of 12 KW and the solar lighting system set up in the PACS has 18 KWP composite capacity with multi crystalline SPV module.

Kerala's Power Sector Projections

As per the 19th Electric Power Survey conducted by Central Electrical Authority, the projected energy consumption for the next 10 years for Kerala is 25,480 mu (million units, 1 unit=1 kwh) in 2017-18, 29,924 mu in 2020-21, 34,393 mu in 2023-24 and 38,756 mu in 2026-27. Over 10 years therefore Kerala's energy is estimated by this survey to increase by approximately 52 per cent above current consumption. The graph highlights the total installed capacity of Kerala from hydel, thermal and renewable sources (Source: ER 2017, GoK).



Government Programmes

- Kerala is one of the first States to announce a Renewable Energy Policy in 2002 itself. It is also one of the few States to have its own Wind Energy Policy [2004] and also announced the Solar Energy Policy in 2013. GoK has also formulated Kerala Small Hydro Power policy 2012 for the promotion and development of Small Hydro Power projects in the State through Private participation.
- Agency for Non-conventional Energy and Rural Technology [ANERT], an autonomous organisation set up by the Govt. of Kerala is the State Nodal Agency [SNA] for the MNRE, GoI to implement centrally-assisted programmes in the State. ANERT's current interventions include Solar SPV and Thermal programmes, Small Hydro projects, Wind

energy, biomass gassification, biogas programmes, roof top solar systems, solar water heating system and energy conservation initiatives. There is a proposal for collaboration between banks & ANERT for popularising the above scheme. There is a need for dovetailing subsidy scheme of ANERT into bank finance for improved adoption of these schemes by prospective beneficiaries.

- Energy Management Centre plays pivotal role in coordinating energy conservation activities in various institutions, industrial centres, commercial establishments and houses.
- The Agriculture Department and KVIC promotes biogas development by providing technical and material support for construction of plants and is directly linked to the annual programmes of these agencies. A subsidy scheme for promoting the installation of biogas plants having individual capacity of not less than 15 m³ is in operation.
- Family Type Biogas Plants-MNRE is providing subsidy for setting up of Family Type Biogas Plants under NBMMP (1 to 6 cubic metre capacity per day) under National Biogas and Manure Management Programme (NBMMP). “Deenabandhu” model of the Department of Agriculture and the “Floating Dome” model of the KVIC are the two models now being encouraged in the state.
- Ministry of New & Renewable Energy has allocated a physical target of 1150 bio gas plants each to to Directorate of Agriculture and ANERT for implementation under National Biogas and Manure Management Programme (NBMMP) during 2017-18.
- Ministry of New and Renewable Energy has been vested with the responsibility of developing Small Hydro Power (SHP) projects up to 25 MW station capacities. The estimated potential for power generation in the in Kerala from such plants is about 704 MW from 245 SHPs. 36 SHP units with installed capacity of 211.17 MW are installed/ under implementation. GoK has also identified 55 new Small Hydro Electric Projects (SHPs) with potential of 95.90MWP for implementation in the State. The above projects will translates into a credit potential of about Rs.1000 crore in the sector in the State which can be tapped over a period of 2-3 years.
- GoK proposed to launch a mega project for installation of solar panels over rooftops of houses for generating 1000 MW of electricity during 2017-18. In the first phase of this, solar panels will be installed on the rooftops of Government offices.



Constraints and issues

- Bio-energy / Biogas: While waste management poses a serious problem it also provides a window of opportunity for the power deficit Kerala. An average person generates about 4.5 pounds of waste per day. It can be reused to generate clean, renewable power. Biogas can be generated from organic waste from agriculture, animal husbandry and domestic sectors, and Power generation from Municipal Solid Waste (MSW) and Industrial Waste. Community bio-gas plants may be set up in each district to address the waste management issue and also to generate clean energy.
- To make it mandatory to install solar energy based devices to meet at least a part of the energy requirement in all households and offices.
- Rural housing loan policy may be redesigned to include a promotional component for installing solar power lighting & heating systems.
- To make it mandatory to install bio-gas based waste disposal system in all

- households.
- Setting up of units for treatment of solid waste by the PRIs, NGOs and Developmental Agencies may be supported by banks.
 - Government Departments may motivate and train farmer groups/ Farmers' Clubs and SHGs to establish bio-gas units for compact areas and for scientific collection of solid waste through peoples' participation. The Nodal Department may give publicity coordination and follow-up works to avail carbon credits to the investors.
 - Banks may work in unison with the NGOs and the Government Depts. to identify progressive farmers to set up biogas units.
 - Sponsoring agencies should provide more attention for improving the post construction, repair and maintenance service
 - Adequate and wide publicity may be given to non-conventional /alternate energy sources.
 - Policy makers may think of having a stipulation regarding installation of Solar Panels in new buildings similar to the norm regarding compulsory Rainwater Harvesting system with all new buildings.

Credit Potential for 2019-20

Considering the above developments, potential for the **year 2019-20 has been assessed at Rs.262.33 crore.**



CHAPTER INFRASTRUCTURE PLANNING

5

5.1 Introduction

Availability of adequate Infrastructure is a prerequisite for sustained economic growth particularly in the rural areas. Infrastructure forms the foundation on which social, economic and industrial development is built and paves the way for new opportunities, generates additional employment and income, facilitates and improves other rural services. Adequate and locally appropriate infrastructure is essential to achieve the full development potential of a given region. The growth, new investment opportunities, employment potential, other socio economic development etc., are dependent on the creation of critical infrastructure required in the various sectors of the rural economy.

Investments for Creation of Rural Infrastructure is generally met from the public sources. However, of late particularly for few of the sectors related with social infrastructure, credit from financing institution is being sourced. The requirement is gradually increasing and in a short span, many new sectors will be in a position to attract credit, due to the technical soundness and the bankability of the projects.



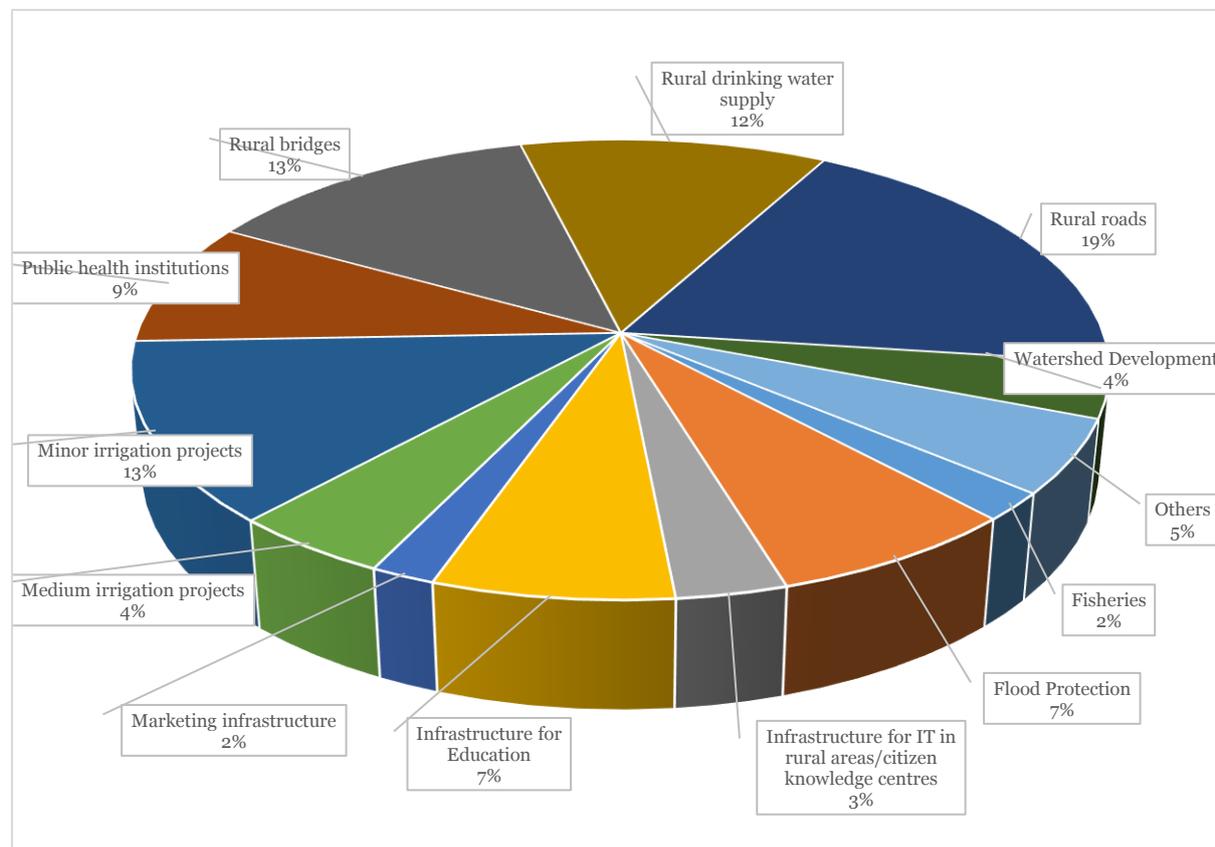
NABARD, since inception, has prioritized its strategies for facilitating credit flow to facilitate investments rural areas to fulfill its mission of rural prosperity through credit and related services. From the year 1995 onwards, NABARD is in the fore front of funding rural infrastructure projects through its flagship programme of Rural Infrastructure Development Fund (RIDF) and as on date projects worth Rs.3.139 lakh crore has been provided throughout the country. In Kerala, projects, with a total financial outlay of Rs.11,206 crore involving RIDF loan of Rs.9,353 crore have been assisted. The corpus of RIDF XXIV is Rs.28,000 crore. The normative allocation for Kerala State for Tranche XXIV is Rs.900 crore (the normative allocation was enhanced from Rs.500 crore to Rs.900 crore, in the wake of the devastation caused by floods during July-August 2018). At present 37 activities are eligible for funding under RIDF. The details of projects sanctioned under RIDF in the State upto 31 March 2018 is given below:

Details of Projects sanctioned under RIDF (Rs. crore)

Sr. No.	Sector	No. of projects	TFO	RIDF loan
1	Animal husbandry	14	268.21	131.83
2	Construction of anganwadi centres	737	56.43	47.94
3	Fishing harbour/jetties	98	218.31	186.32
4	Flood protection	213	716.70	673.89
5	Forest development	52	130.52	122.23
6	Infrastructure for information technology in rural areas/citizen knowledge centres	8	390.77	296.14
7	Infrastructure for rural education institutions	288	775.99	643.81
8	Inland waterways	3	25.14	21.88
9	Market yard, godown, mandi, rural haat, marketing infra.	226	183.22	172.22
10	Medium irrigation projects	13	502.68	428.27
11	Mini hydel projects/small hydel projects (upto 10 mw)	8	73.63	67.96
12	Mini hydel projects/small hydel projects (upto 25 mw)	1	25.07	18.07
13	Minor irrigation projects	1844	1256.57	1183.50
14	Modern abattoir/meat processing	5	21.28	14.83
15	Public health institutions	184	973.52	812.12
16	Rural bridges	432	1474.12	1219.08
17	Rural drinking water supply	172	1451.00	1103.74
18	Rural roads	1526	2202.44	1787.27
19	Seed/agriculture/horticulture farms	22	40.81	38.77

20	Solid Waste Management and Sanitation in rural areas	1	0.06	0.05
21	Watershed development/reclamation of waterlogged areas	470	386.90	358.89
22	Solar Photovoltaic Power Plants	5	32.67	24.61
Total		6322	11206.02	9353.42

5.2 RIDF Projects sanctioned- Percentage distribution Major Sector



In addition to RIDF, for assisting infrastructure projects in Rural Areas, NABARD has introduced various other products like NABARD Infrastructure Development Assistance (NIDA), Warehouse Infrastructure Fund (WIF), Food Processing Fund (FPF), Watershed Development Fund (WDF), Tribal Development Fund (TDF), Umbrella Programme for Natural Resources Management (UPNRM) etc.

5.3 Infrastructure for facilitating Capital formation in Agriculture

The share of investment credit in total agriculture credit is alarmingly low in the State. There are various reasons for this trend. Fragmented land holding with an average size of 0.22 ha per holding is the major reason for the low investment credit flow to the agriculture sector.

A sector-wise analysis of the potential investments required for capital formation in agriculture and allied sector are detailed below.

Animal Husbandry

An amount of Rs.131.83 crore has been sanctioned up to 31 March 2018 for 14 Animal Husbandry projects under RIDF. Of the same, 7 projects have been completed and 7 are under implementation.

Potential infrastructure investments in Animal Husbandry

Projects for achieving self-sufficiency in milk production, poultry – broiler as well as layer, hatcheries, cattle feed production, veterinary dispensaries etc. need to be supported.

Fisheries

An amount of Rs.186.32 crore has been sanctioned up to 31 March 2018 for 98 fishery projects under RIDF. Of the same, 27 projects have been completed and 71 are under implementation.

Potential infrastructure investments in Fisheries

The major infrastructure requirements under various sub-sectors of fisheries in the State include mainly seed farms, fishing harbours, jetties, landing centres and connectivity projects. Infrastructure creation for development of inland fishery is also a requirement.



Irrigation

A total of 1844 Minor Irrigation projects have been sanctioned up to 31 March 2018 under RIDF to Govt. of Kerala with a total loan of Rs.1183.50 crore. Against the sanction, 1476 projects have been completed and 368 projects are ongoing.

Potential infrastructure investments in Irrigation

Potential areas for infrastructure development for irrigation sector include construction of check dams, vented cross-bar (VCBs), renovation of ponds, construction of outer bunds, storage weirs, protection works to irrigation and waterways, irrigation tanks, regulator cum bridges, construction of canal, drainage channel, deepening of channels, lift irrigation and flood protection. Field channels constructed for bringing the water to the fields of the farmers are not being maintained properly. As farmers are reluctant to invest in the maintenance of field channels due to inadequate return from farming mainly on account of high labour cost in Kerala, Government may consider investing in concrete field channels which will reduce the operation and maintenance costs.

In check dams and VCBs, there is only limited scope for storage of water due to limitation in height. However, there are many sites on rivers like Meenachil and Achenkovil where the bank height is enough to support construction of a mini dam as high as 10 M which will store substantial quantity of water and this does not require land acquisition. Environmental flow through the downstream can be ensured with the use of shutters. An investment of approximately Rs.40 crore is required for one such mini dam. The site selection should be such that the water can be used for lift irrigation purposes as well as for rural drinking water supply.

There are also some last mile projects which are to be completed in the irrigation sector. Kayamkulam branch canal of Kallada Irrigation Project, Kaviyoor branch canal of Pampa Irrigation Project, and canals in Periyar Valley Irrigation Project require completion.

Watershed / land development

An amount of Rs.358.89 crore has been sanctioned up to 31 March 2018 for 470 watershed projects under RIDF. Against the sanction, 323 projects have been completed and 147 projects are ongoing. Another 135 projects with outlay of Rs.121.15 crore have been sanctioned under WDF and all the projects have been implemented.

Potential infrastructure investments in watershed / land development

Out of the total geographical area of 38.86 lakh ha of the State, it is roughly estimated that 12.28 lakh ha. are prone to soil erosion hazards. It is estimated that around 3.82 lakh ha area has been so far treated with soil and water conservation measures. There is a potential of treating balance 8.46 lakh ha of land prone to soil erosion hazards. Considering an investment of Rs.20,000 per ha of watershed development, total investment estimated is Rs.1692 crore for conservation of soil and water through watershed projects.

As per the statistics available from the Department of Economics and Statistics, there are 70,976 ha area under current fallow and 57,346 ha land under fallow other than current fallow in the State. It is estimated that fallow land to the extent of 20,000 ha can be brought into cultivation in the State with an investment of Rs.240 crore.

5.4 Infrastructure under Social Sector

Drinking Water

KWA has been sanctioned a total sum of Rs.1103.74 crore under RIDF for implementing 172 schemes up to 31 March 2018. Currently, 84 schemes are ongoing and 88 schemes have been completed.

Potential infrastructure investments in Drinking water supply



As per Census 2011, there are 6,31,136 households in Kerala have their drinking sources away from their dwelling. As per the Census Manual, a water source is considered away if the distance to it exceeds 100m in urban areas and 500m in rural areas. Considering the recent drinking water supply projects sanctioned under RIDF, the average investment per person benefited works out to Rs.7,000. Total investment required for providing drinking water to those 6,31,136 household works out to Rs.2,650 crore. Further, although the Kerala

population is covered as far as the requirement of 40 lpcd (litre per capita per day), Kerala Government is aiming at providing 70 lpcd to the rural population and 120-195 lpcd in the urban population. This requires substantial investment in the drinking water supply scheme.

Rural Health

Present Status

The health care system in Kerala comprises mainly under three heads namely Allopathy, Ayurveda and Homoeopathy. The health infrastructure consists of 2724 institutions with 52,893 beds. Besides there are 5403 sub centres under Directorate of Health Services. Out of the total institutions 46.44% are under Allopathy, 32.2% under Ayurveda and 21.36% under Homoeopathy Department. Medical services are also provided through the Co-operative Sector and the private sector. There are 74 hospitals with 6767 beds under the Co-operative Sector in the State. Directorate of Health Services manages Primary Health Centres (835 Nos), Community Health Centres (230 Nos), Taluk/District /Women & Children Hospitals (103 Nos), Dispensaries (25), TB Clinics/Centres (17 Nos), Grant-in-aid institutions (29 Nos), Leprosy Control Units (3 Nos), Sub Centres (5403 Nos).



Under RIDF a total amount of Rs.812.12 crore has been sanctioned for 184 projects under rural health sector up to 31 March 2018. Against the same, 87 projects have been completed and 97 are currently ongoing.

Potential infrastructure investments in Rural Health

Potential investments required in Rural Health include infrastructure for Women & Child Hospital, strengthening CHCs and PHCs, District Ayurveda hospital buildings, improvements in District Hospitals, improvements to Taluk Head Quarter Hospitals, Government Ayurveda Hospitals, Government Ayurveda Dispensaries, Taluk Homeopathy Hospitals, Community Homeo Hospitals, Government Homeo Dispensaries and other Government Hospitals and Dispensaries.

Rural Education

Present Status

Under RIDF an amount of Rs.643.81 crore has been sanctioned for 288 projects up to 31 March 2018, of which 168 have been completed and 120 are currently ongoing.

Potential infrastructure investments in Rural Education

Infrastructure is also required for construction of classrooms, colleges, new HS/HSS educational institutions, Government Arts and Science colleges, Anganwadis, Infrastructure for District Educational Training Institute, Medical Colleges, Engineering Colleges, Government Nursing College, Post-Metric hostel for SC/ST students, Higher Secondary School buildings-construction of 2nd& 3rd floors-incomplete project, Higher Secondary School buildings, class rooms and labs for schools and drinking water facility for schools.

5.5 Infrastructure under Rural Connectivity

Present Status

In Kerala, the Public Works Department have a total road length of 33,106 kms of State roads and 1,542 km of National Highways. The State roads include 4,342 kms., of State Highways and 18,900 km of Major District Roads. Road improvements, repair and maintenance of existing roads, development and upgradation are the major activities taken up in the sector during the year. Budgetary support, private finance and institutional supports are used for the purpose.

Analyzing the PWD roads reveals that only 6.66 km is concrete, 22,174 km is black topped and 447 km water bound macadam. The black topped surface contributes 95.4 percentage of the total. There are 2179 bridges (627 on SH and 1,552 on MDR) and 51,422 culverts (11,512 on SH and 39,910 on MDR) in PWD. Of them 148 bridges and 1519 culverts are unsafe and need reconstruction / renovation. Grama Panchayats and Block Panchayats maintain lion share of State Roads which comes to 104,257 km which constitutes 68.75% of the total road length in the State.



Under RIDF 1526 rural road projects involving a total loan of Rs.1,787.27 crore have been sanctioned up to 31 March 2018. Against the same 962 projects have been completed and 564 projects are currently ongoing. Similarly in the case of 432 rural bridge projects with total loan of Rs.1,219.08 crore sanctioned under RIDF up to 31 March 2018, 332 projects have been completed and 100 are currently ongoing.

Potential infrastructure investments in rural connectivity

As proposed by NATPAC as well as other agencies improvement proposals for major roads, investments in outer ring roads, upgradation of existing panchayat roads, foot bridges, coastal roads, etc., are to be addressed on priority basis.

CHAPTER SUSTAINABLE AGRICULTURE PRACTICES

6

6.1 Introduction

Sustainable agriculture is a type of agriculture that focuses on producing long-term crops and livestock while having minimal effects on the environment. This type of agriculture tries to find a good balance between the need for food production and the preservation of the ecological system within the environment. In addition to producing food, there are several overall goals associated with sustainable agriculture, including conserving water, reducing the use of fertilizers and pesticides, and promoting biodiversity in crops grown and the ecosystem.

There are many farming strategies that are used that help make agriculture more sustainable. Some of the most common techniques include growing plants that can create their own nutrients to reduce the use of fertilizers and rotating crops in fields, which minimizes pesticide use because the crops are changing frequently. Another common technique is mixing crops, which reduces the risk of a disease destroying a whole crop and decreases the need for pesticides and herbicides. Sustainable farmers also utilize water management systems, such as drip irrigation, that waste less water.

6.2 Kerala Scenario

The agricultural scenario in Kerala is unique in terms of cropping pattern, land use pattern and size of land holdings. The cropping pattern is predominantly commercial crops and the operational holdings are very small. The land use pattern in Kerala indicates a steady increase in land put to non- agricultural uses. The state is ecologically sensitive owing to the geography and topography. This has led to reduced agricultural production and decrease in the contribution of agriculture to the state GDP. The state is rich in biodiversity and has many hot spots. The impact of climate change is being increasingly experienced in the state and the situation calls for promoting sustainable agriculture on a mission mode in the state.



6.3 National Mission for Sustainable Agriculture (NMSA)

Govt of India has launched the National Mission for Sustainable Agriculture (NMSA) for conservation of natural resources in conjunction with enhancing agricultural productivity in rainfed areas to meet the burgeoning demand for foodgrains. The mission would cater to key dimensions of water use efficiency, nutrient management, livelihood diversification through adoption of sustainable development pathway by progressively shifting to environmental friendly technologies, use of energy efficient devices, conservation of natural resources, integrated farming etc. Besides, NMSA aims at promoting location specific improved agronomic practices, through soil health management, enhanced water use efficiency, judicious use of chemicals in agriculture, crop diversification, progressive adoption of crop-livestock farming systems and integrated approaches like crop-sericulture, agro-forestry, fish farming etc. The Mission has adopted the following multipronged strategy;

- Promoting integrated farming system covering crops, livestock & fishery, plantation and pasture based composite farming
- Popularizing resource conservation technologies (both on-farm and off-farm) and introducing practices that will support mitigation efforts in times of extreme climatic events or disasters like prolonged dry spells, floods etc.
- Promoting effective management of available water resources and enhancing water use efficiency through application of technologies together with demand and supply side management solutions
- Encouraging improved agronomic practices for higher farm productivity, improved soil treatment, increased water holding capacity, judicious use of chemicals / energy and enhanced soil carbon storage
- Creating database on soil resources through land use survey, soil profile study and soil analysis on GIS platform to facilitate adoption of location and soil specific crop management practices & optimize fertilizer use
- Promoting location and crop specific integrated nutrient management practices for improving soil health, enhancing crop productivity and maintaining quality of land and water resources
- Involving knowledge institutions and professionals in developing climate change adaptation and mitigation strategies for specific agro climatic situations and promoting them through appropriate farming systems
- Programmatic interventions in select blocks as pilots for ensuring integrated development through dissemination and adoption of rainfed technologies with greater reach in disadvantaged areas & location specific planning by way of coordination, convergence and leveraging investments from other Schemes/Missions like MGNREGS, IWMP, RKVY, National Food Security Mission (NFSM), etc.
- State Government may engage reputed NGOs for implementation of cluster / village development plan
- Strong technical monitoring and feedback systems on climate change mitigation and adaptation issues to the National Advisory council for regular updates on technical feasibility of various components and their effectiveness in bringing about the climate resilience. The experts of central institutes and state agricultural universities would be part of such technical monitoring/feedback. The capacity building of the implementing agencies to be steered by MANAGE.



The NMSA has four major programme components, which are as under:

1. Rainfed Area Development (RAD): An area based approach will be adopted for development and conservation of natural resources along with farming systems. Formulated in the design of 'watershed plus framework', the idea is to explore potential utilization of natural resources base / assets available /created through watershed development and soil conservation activities/interventions under MGNREGS, NWDPR, RVP&FPR, RKVY, IWMP etc.. Appropriate farming systems is to be introduced by integrating multiple components of agriculture such as crops, horticulture, livestock, fishery, forestry with agro based income generating activities and value addition. Besides, soil test/soil health card based nutrient management practices, farmland development, resource conservation and crop selection conducive to local agro climatic condition will also be promoted under this component. A cluster based approach of 100 hectare or more would be adopted to derive noticeable impact of convergence and encourage local participation and for future replication of the model in larger areas.

2. On Farm Water Management (OFWM): The focus would be on enhancing water use efficiency by promoting efficient on-farm water management technologies and equipment. Emphasis would be on effective harvesting & management of rainwater in addition to efficiency in application of water. Assistance will be extended for adopting water conservation technologies,

efficient delivery and distribution systems etc. Water Users Associations would be involved for Emphasis management and equitably distribution. Farm ponds may be dug using MGNREGA funds for on Farm conservation of rain water.

3. Soil Health Management (SHM): SHM will aim at promoting location as well as crop specific sustainable soil health management including residue management, organic farming practices by way of creating and linking soil fertility maps with macro-micro nutrient management, appropriate land use based on land capability, judicious application of fertilizers and minimizing the soil erosion/degradation. Assistance will be provided for various improved package of practices based on land use and soil characteristics, generated through geographical information system (GIS) based thematic maps and database on land and soil characteristics through extensive field level scientific surveys. Support would also be available for reclamation of problem soils (acid/alkaline/saline).

4. Climate Change and Sustainable Agriculture: Monitoring, Modelling and Networking (CCSAMMN): CCSAMMN will provide creation and bi-directional (land/farmers to research/scientific establishments and vice versa) dissemination of climate change related information and knowledge by way of piloting climate change adaptation / mitigation research / model projects in the domain of climate smart sustainable management practices and integrated farming system suitable to local agro-climatic conditions. The expert teams of NMSA would monitor and evaluate the mission activities. Comprehensive pilot blocks will be supported to illustrate functional mechanism for dissemination of rainfed technologies, planning, convergence and coordination with flagship schemes/Missions like MGNREGS, IWMP, Accelerated Irrigation Benefit Programme (AIBP), RKVY, NFSM, MIDH, NMAET etc. A consortium approach will be evolved with various stake holders including knowledge partners like State Agricultural Universities (SAUs), Krishi Vigyan Kendras (KVKs), Indian Council of Agricultural Research (ICAR) Institutes etc. by the State Government to provide single window service/knowledge provider system for the benefit of farming community. Financial support may be provided through States to institutionalize the concept and meeting supplementary.



water development programmes,

Management and the State wide campaign on Water Conservation conducted during 2017. Realising that aggregation is an effective method to mitigate risk in agriculture and strengthen livelihoods, particularly small and marginal farmers, NABARD has promoted the formation of Farmer Producer Organisations. NABARD has also been making substantial efforts for accessing resources for financing climate change initiatives.

6.4 NABARD's Initiatives

NABARD, through its various initiatives, has demonstrated that natural resource management not only leads to sustainable agricultural growth, but also helps in meeting some of the serious challenges being faced by small and marginal farmers due to depleting water availability, fragmented land holdings, climate change etc. The initiatives to conserve soil and resources include participatory watershed Umbrella Project on Natural Resource

State Government initiatives

Kerala State Organic Farming Policy, Strategy and Action Plan

The state has come out with a Vision on Organic Farming, Policy, Strategy and Action Plan to make Kerala's farming sustainable, rewarding and competitive, ensuring poison-free water, soil and food to every citizen.

The State Department of Agriculture is engaged in the promotional activities on organic farming since 2002-03. In the following year, the Department set up a cell for Promotion of Sustainable Agriculture and Organic Farming. It has also launched two brands, namely 'Kerala Organic' and 'Kerala Naturals' to market organic farm produce.

Haritha Keralam Mission: The Mission has been launched in the state to ensure revival and pollution free water resources, water conservation through participatory approach, eco-friendly and sustainable waste management and promoting organic cultivation.

The Kerala Conversion of Paddy Land and Wetland Bill, 2007: This bill is intended to conserve the paddy land and wetland and restrict the conversion or reclamation thereof in Kerala, to the minimum.

Rashtriya Krishi Vikas Yojana (RKVY): As per the scheme, the Government of Kerala has to prepare the State and District-level plans in the field of agriculture based on agro-climatic conditions, availability of technology and natural resources.

Training Institute: Kerala has started an agricultural training institute and identified as a very important input to strengthen the micro level agricultural activities to make it more farmer-friendly and profit oriented.

Organic farming: Kerala has a remarkable share in the organic agriculture. The Department of Agriculture, the State Horticulture Mission (SHM) and the VFPC are the major agencies supporting the organic farming directly in the state apart from NGOs.

Collective farming through Kudumbashree: Harithashree is the lease land farming promoted by the State Poverty Eradication Mission, Kerala, through Kudumbashree. This has helped women farmers to stay on to agriculture for their livelihood. The major crops being cultivated by the Kudumbashree groups are paddy (27% of area) followed by vegetables.

Sustainable agriculture - Some Promising Technologies / Farming Practices in Kerala



Rice-based Integrated Farming System

Rice fields in Kerala are typical wetland ecosystems with numerous ecological and economic concerns. The high rainfall coupled with a topography bound by Western Ghats in the East running into mid lands and plain land and bound by Arabian sea in East generates different moisture regimes for crop growth resulting in a wide range of micro-environments. Given the combination of season, and topography, rice is

grown in Kerala under a variety of agronomic conditions ranging from totally dry to floating rice under rising water conditions, rainfed to irrigated, in sandy to clayey soils and saline to acidic soils. Crop diversification has immense potential in rice-based ecosystems. The studies conducted at Cropping Systems Research Centre, Karamana revealed that raising green manure (*dhaincha*), *bhindi* or short duration cassava in paddy fields during summer not only enhanced the profitability and employment but also resulted in a shift of the obnoxious weed flora *Echinochloa crusgalli*. In rice-based diversified cropping systems, one crop of rice followed by two crops of Nendran banana offers potential for high income. This system offers more than 10 t/ha crop residues for nutrient recycling.

Homestead-based Integrated Farming System (IFS)

Homestead-based integrated farming system (IFS) is one of the most suitable farming systems in Kerala which helps farmers to increase productivity and income in a sustainable manner. Homestead farming satisfies the requirements of sustainability by being productive, ecologically sound, stable, economically viable, and socially acceptable. The productive aspect of homestead farming arises from the fact that home gardens are resource islands that provide a wide variety of produce for domestic consumption, such as food, beverages, construction materials, firewood, and other household supplies. The system has the capacity to sustain crop or pasture production in the presence of trees, in addition to production from the trees themselves. The different crop or tree species in the homestead satisfy the multifarious needs of the farmer. The produce from trees often provide a substantial proportion of the energy and nutritive requirement of the household diet. The food production in homestead is ensured by a combination of crops with different production cycles resulting in a continuous supply of edible food. The livestock component, besides providing financial support at times of distress, supports the farmer by providing draught power, nutritional security and organic manure.

Banana-based Cropping System

An integrated approach in banana farming taken up by KVK, Kozhikode with the objective of enhancing the income of farmers, is a successful intervention. This technique showed an increase in the yield to the fold of 37 per cent in Kozhikode district of Kerala. Foliar and soil application of a nutrient mixture was done to enhance the production. Foliar application was done at the rate of 5g/l of water from 4 months after planting till bunching at monthly intervals. Soil application with a recommended dosage of 100g/plant was taken up at 2 months and 4 months after planting. These nutrient mixtures for foliar and soil application were obtained from IIHR, Bangalore and KAU, Thrissur respectively. Banana based integrated farming approach was implemented in Naduvannur, Ulliyeri, Changaroth, Perambra, Kavilumpara, Cheruvannur and Maruthonkara panchayats during 2012 to 2016. An exclusive license to produce and sell the formulations from IIHR, Bengaluru was also obtained. Collaboration with ATMA for scaling up production technologies boosted the prospect of this farming intervention. With a few interventions in the traditional banana based cropping system, plants bunched by 5 ½ months after planting while in the check plot bunching occurred by 7 months only. An increase of 20% in the average bunch weight was recorded. Bunches were uniform in size, bright yellow in colour and matured simultaneously. All these helped the farmers to reduce harvesting and transportation cost and thus increase their



income. The economics of banana cultivation also took an upturn with the productivity of Nendran banana in Kozhikode district increasing from 4259 kg/ha in 2011-12 to 5427kg/ha in 2015-16, almost an increase of 27 percent. Income increased from Rs.2.40 lakh/ha to Rs.4.00 lakh/ha, thus increasing the standard of living of farmers.

Open Precision Farming in High-density Planting Banana

With a focus on increasing the area under banana and its productivity, KVK, Ernakulam took the initiative to introduce open precision farming in banana. Open precision farming is practicing high tech farming in the open field. Generally, precision farming is carried out under poly house condition. By bringing the cultivation of banana in the open field, the farmers were sensitised to the need for applying optimum amount of fertilizers and apt pesticide formulations for saving water and other inputs leading to

efficient farming practice. By the introduction of precision farming technology in the fields of Ernakulam, average production per plant increased and the cropping density increased from 160 plants to 380 plants per 25 cents. The total yield increased by 116 per cent.

Rice-Fish-Duck-Buffalo Integration in Submerged Wetlands

Integrated farming, involving poultry and aquaculture has great relevance in the coastal rice lands of *Kuttanad, Kole / Pokkali in Thrissur* and *Kaippad in Kannur*. The traditional paddy cultivation involving salt-resistant and tall variety of paddy, which is practiced during the rainy season from May-June to September-October is followed by shrimp filtration from November to April, when the salinity builds up. Shrimp filtration is essentially a trapping cum holding system in which, water is let into the field through sluice gate during high tide and closed when the level of water is uniform inside and outside, trapping valuable fish and shrimp.

There are many advantages to this system of integrating traditional farming of paddy and fish/shrimp together. The paddy field provides room for naturally available fish or shrimp juveniles to grow and attain marketable size, with supplementary natural feed while the excreta of fish/ shrimp provides nutrition to the ensuing paddy crop. Such a system will not only reverse the present trend of non-utilization and under-utilization of rice field but also make rice farming more attractive due to the increase in productivity and profitability. As buffalo/poultry/duckery also forms an integrated constituent of such a farming system, it can sustain food security. This system of farming could trigger a process of change whereby the income and economic prosperity of people living in these areas will increase leading to economic resurgence and thus sustainability of the ecosystem.

Vertical Farming for Urban/Peri-urban Households

Integrated intensive vertical farming is an innovative farming concept which is suitable for states like Kerala where land is a constraint. A model vertical farming unit developed by KVK, Kannur and popularly known as 'Giggin's Farm Villa' is found to ideal for large scale adoption due to its comprehensive design and lucrative income prospects. The unit can be set up even on one cent of land. It is multifaceted in nature, wherein farmers can rear goat, hen, rabbit and quail, while also growing vegetables, gathering seeds, supplying saplings and catering to production of organic manure.



The pyramidal structure of the farm makes it self-supporting. The farm is like an apartment where animals are grown in different storeys. Adequate micro climate is assured for animals and crops to have a sustainable production of eggs, meat, milk and vegetables. All the components in the vertical farm are in harmony. Waste from one component is used as input for the other. The efficiency of the farm depends on how well the components are managed throughout the year. Estimates reveal that Rs.2 lakh to Rs.2.5 lakh can be earned a year and the unit will start earning profit by the third year.

Annexure I
Activity-wise & Block-wise District wise and Sub Sector wise PLP projections for 2019-20

(Rs. lakh)

Particulars	Thiruvananthapuram	Kollam	Alappuzha	Pathanamthitta	Kottayam	Idukki	Ernakulam	Thrissur	Palakkad	Malappuram	Kozhikode	Wayanad	Kannur	Kasargode	Total
Credit Potential for Agriculture															
Farm Credit															
Crop Production, Maintenance and Marketing	305175	168883	255250	241799	602968	434789	540399	372068	390136	344253	364962	263110	285506	191066	4760365
Water Resources	12964	2498	5583	11379	3673	5416	4828	17203	8372	6079	11079	4760	15134	9874	118842
Farm Mechanisation	8215	3391	5066	8280	19341	1965	3121	11682	5550	13341	10825	3245	5956	5118	105094
Plantation and Horticulture	42088	16249	14816	23524	40604	64158	60148	76415	25284	45940	45040	54100	41520	30124	580010
Forestry and Wasteland Development	418	500	2244	3519	5523	3129	40	312	1285	970	1846	310	470	741	21306
Animal Husbandry - Dairy	42448	10223	14618	17601	18657	8154	15758	37718	19064	34993	11734	16225	43381	9965	300540
Animal Husbandry - Poultry	15985	2101	2622	2527	8466	619	1983	16356	2267	12774	6082	1275	2171	2064	77292
Animal Husbandry - Sheep, Goat, Piggery, etc.	9090	2922	2360	2756	6676	4761	2048	13855	8803	9258	8313	4035	6828	4935	86639
Fisheries (Marine, Inland, Brackish water)	5210	3308	8587	2053	3922	671	17037	3069	1652	3518	6350	340	4143	1477	61337
Others - Bullock, Bullock cart etc.	16	0	0	54	0	2	0	75	620	0	0	0	0	321	1088
Sub-Total	441609	210075	311147	313491	709829	523664	645361	548753	463033	471126	466231	347400	405109	255685	6112513
Agriculture Infrastructure															
Construction of storage facilities (Warehouses, Market Yards, Godowns, Silos, Cold Storage units/ cold storage chains)	6161	1680	4528	2366	2021	732	988	2566	2205	2635	2762	5595	2833	1470	38542
Land development, soil conservation, watershed development	23486	3887	11121	11540	23407	11853	8663	25205	19098	19972	13659	6665	13393	18584	210532
Others (Tissue culture, Agri bio-technology, Seed production, Bio pesticides/ fertilizers, Vermin composting)	335	1942	651	1640	459	284	818	2548	2379	908	1801	710		1396	15872
Sub-Total	29981	7509	16301	15546	25887	12869	10469	30318	23682	23516	18222	12971	16226	21450	264945
Ancillary activities															
Food and Agro processing	4378	258348	1061	3631	6716	2731	14915	10905	2856	21710	25779	4470	25041	3135	385675
Others (Loans to Cooperative Societies of farmers for disposing of their produce, Agri clinics/ Agri Business centres, Loan to PACS/FSS/ LAMPS, Loans to MFIs for on-lending)	2160	6000	940	384	101098	89	7630	680	81	1485	1971	12100	550	32033	167200
Sub-Total	6538	264348	2001	4015	107814	2819	22545	11584	2937	23195	27750	16570	25591	35168	552875
Total Agriculture	478128	481932	329448	333051	843530	539352	678375	590656	489652	517837	512202	376941	446926	312302	6930334
Micro, Small and Medium Enterprises															
MSME - Working Capital	96924	115765	24431	8450	30770	28754	93148	245915	417717	246837	149189	10601	80212	33734	1582446
MSMS - Investment Credit	151934	108089	366466	123240	247860	143771	692739	131270	9450	84565	285113	48369	78805	54900	2526571
Total MSME	248858	223854	390897	131690	278630	172525	785887	377185	427167	331402	434302	58970	159017	88634	4109017
Export Credit	652	14032	4400	3920	7650	28	72000	12800	359	160	2400	1620	900	600	121521
Education	67620	25356	10125	20520	16200	16355	48451	38432	57717	25920	45205	17550	162338	18500	570289
Housing	222927	187436	29655	64080	213570	20226	268837	374720	72000	85176	122008	29970	510300	65150	2266054
Renewable Energy	623	74	2319	3125	6646	890	659	972	5293	1435	1083	130	847	2137	26233
Others (Loans to SHGs/JLGs, loans to distressed persons to prepay non-institutional lenders, PMJDY, loans to State sponsored organisations for SC/ST)	159020	47147	36400	38300	21698	7943	29999	78696	3096	39941	26797		66204	0	555240
Social Infrastructure involving bank credit	1044	4320	1320	2320	2160	1183	2706	10540	378	1454	1455	420	2610	5681	37591
Sub Total	451885	278365	84219	132265	267923	46625	422652	516160	138843	154085	198948	49690	743199	92068	3576927
Total Priority Sector	1178872	984151	804564	597007	1390083	758502	1886914	1484000	1055662	1003325	1145453	485601	1349141	493005	14616278

Annexure II

Agency wise, Broad Sector -wise flow of Ground Level Credit (GLC)

(Rs.crore)

Particulars	2014-15			2015-16			2016-17			2017-18		
	Tgt.	Ach.	% Ach.	Tgt.	Ach.	% Ach.	Tgt.	Ach.	% Ach.	Tgt.	Ach.	% Ach.
Crop Loan												
Commercial Banks	16860.68	26020.03	154.32%	20479.08	25379.69	123.93%	22627.35	24735.17	109.32%	23890.57	31712.08	132.74%
Cooperatives	8338.71	10874.57	130.41%	10460.65	11235.47	107.41%	12566.71	8759.34	69.70%	13848.25	8506.49	61.43%
RRB	3268.53	4783.95	146.36%	3782.7	5239.02	138.50%	4198.46	6915.1	164.71%	4777.74	8024.22	167.95%
Others	0.00	6.2	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Total	28467.92	41684.75	146.43%	34722.43	41854.18	120.54%	39392.52	40409.61	102.58%	42516.56	48242.79	113.47%
Agri. Term Credit												
Commercial Banks	6637.16	4509.73	67.95%	7258.37	6666.31	91.84%	9187.21	9066.86	98.69%	8325.39	11720.61	140.78%
Cooperatives	4930.16	2065.08	41.89%	4924.19	2332.34	47.36%	4949.17	1599.55	32.32%	5884.43	4932.3	83.82%
RRB	830.62	700.98	84.39%	995.78	1520.73	152.72%	736.87	3193.56	433.40%	1356.45	2193.72	161.73%
Others	0.00	119.34	0.00%	0	0	0.00%	0.2	0.43	0.00%	0	0	0.00%
Total	12397.94	7395.13	59.65%	13178.34	10519.38	79.82%	14873.45	13860.40	93.19%	15566.27	18846.63	121.07%
Total Agril. Credit (Crop Loan+ Agri. Term Credit)												
Commercial Banks	23497.84	30529.76	129.93%	27737.45	32046.00	115.53%	31814.56	33802.03	106.25%	32215.96	43432.69	134.82%
Cooperatives	13268.87	12939.65	97.52%	15384.84	13567.81	88.19%	17515.88	10358.89	59.14%	19732.68	13438.79	68.10%
RRB	4099.15	5484.93	133.81%	4778.48	6759.75	141.46%	4935.33	10108.66	204.82%	6134.19	10217.94	166.57%
Others	0.00	125.54	0.00%	0.00	0.00	0.00%	0.20	0.43	0.00%	0.00	0.00	0.00%
Total	40865.86	49079.88	120.10%	47900.77	52373.56	109.34%	54265.97	54270.01	100.01%	58082.83	67089.42	115.51%
Non Farm Sector												
Commercial Banks	10958.91	11119.50	101.47%	13083.14	13378.02	102.25%	17540.94	14390.87	82.04%	18257.16	25070.71	137.32%
Cooperatives	3595.24	5075.83	141.18%	4398.68	4527.64	102.93%	6998.56	5840.83	83.46%	9726.29	4947.00	50.86%
RRB	1518.88	1005.05	66.17%	1309.02	988.47	75.51%	1926.38	1202.87	62.44%	2268.889	1075.3579	47.40%
Others	348.60	373.13	107.04%	379.01	383.25	101.12%	454.83	302.74	66.56%	569.34	0	0.00%
Total	16421.63	17573.51	107.01%	19169.85	19277.38	100.56%	26920.71	21737.31	80.75%	30821.67	31093.07	100.88%
Other Priority Sector												
Commercial Banks	18775.84	13033.56	69.42%	19175.63	17031.23	88.82%	17358.10	14738.50	84.91%	18787.95	22208.78	118.21%
Cooperatives	15645.13	17204.25	109.97%	16680.17	18123.53	108.65%	16591.48	15902.58	95.85%	17961.59	16795.87	93.51%
RRB	1284.62	693.90	54.02%	1825.45	1127.58	61.77%	1726.31	1148.87	66.55%	1924.13	1099.94	57.17%
Others	130.98	105.66	80.67%	185.73	189.19	101.86%	85.82	115.18	134.21%	0.00	0.00	0.00%
Total	35836.57	31037.37	86.61%	37866.98	36471.53	96.31%	35761.71	31905.13	89.22%	38673.66	40104.59	103.70%
Total Priority Sector												
Commercial Banks	53232.59	54682.82	102.72%	59996.22	62455.25	104.10%	66713.60	62931.40	94.33%	69261.07	90712.18	390.34%
Cooperatives	32509.24	35219.73	108.34%	36463.69	36218.98	99.33%	41105.92	32102.30	78.10%	47420.55	35181.66	212.48%
RRB	6902.65	7183.88	104.07%	7912.95	8875.80	112.17%	8588.02	12460.40	145.09%	10327.20	12393.23	271.13%
Others	479.58	604.33	126.01%	564.74	572.44	101.36%	540.85	418.35	77.35%	569.34	0.00	0.00%
Total	93124.06	97690.76	104.90%	104937.60	108122.47	101.03.04%	116948.39	107912.45	92.27%	127578.17	138287.08	108.39%

ANNEXURE III
CRITICAL INFRASTRUCTURE SUPPORT REQUIRED

(Amt. in Rupees)

District	Health care facilities		Palliative care		Old age homes		Waste Mgmt		Schools/ college		Market Infra		Farm Tourism		Renewable Energy/Biogas		Drinking water		Total	
	Phy.	BL	Phy.	BL	Phy.	BL	Phy.	BL	Phy.	BL	Phy.	BL	Phy.	BL	Phy.	BL	Phy.	BL	Phy.	BL
Thiruvananthapuram									51	612					1942	623	108	432	159	1044
Kollam	54	1296							64	1024	1	2000			246	74			119	4320
Alappuzha	25	1000					20	1120							4700	1198	50	320	95	2440
Pathanamthitta	50	2000													3342	3125	50	320	100	2320
Kottayam	16	1440							16	720					2845	6646			32	2160
Idukki	11	990							19	193.23					1885	890			30	1183.2
Ernakulam	15	2400							15	306					1763	659			30	2706
Thrissur	86	688	48	288	15	120	2100	252	8	320	18	360	41	1312	3960	8171			2316	3340
Palakkad	14	126							28	252					3227	5293			42	378
Malappuram	15	891							750	563					4704	1435			765	1454
Kozhikode	15	885							15	570					5290	1083			30	1455
Wayanad	5	225			4	15	8	30	4	150									21	420
Kannur									580	2610					4522				580	2610
Kasargode	29	5681																	29	5681
Total	335	17622	48	288	19	135	2128	1402	1550	7320	19	2360	41	1312	38426	29197	208	1072	4348	31511

Annexure IV
Critical interventions required in various sectors/sub sectors

Sl. No.	Sector/ Sub sector	Critical intervention required
1	Short term credit for production, marketing and food security	<ul style="list-style-type: none"> • Full coverage of Crop insurance under PM's Fazal Bhima Yojana and also Agri insurance of GoK as a protection against crop failures upto 100% as in the case of breach of bunds during rainy season. • Government may evolve suitable guidelines and institutional arrangements to enable effective farming in lease land/ fallow land farming. • Digitisation of land records for facilitating leased land farmers. • Creation of infrastructure for post-harvest processing and storage and accreditation of warehouses so that the receipts issued by these warehouses can be negotiable warehouse receipt and used by farmers for accessing cheap credit from the banking system • Encourage peer learning, group approaches among farmers. The existing network of farmer clubs promoted by NABARD and groups promoted by ATMA, VFPC can be leveraged for the purpose • Department to implement the District Irrigation Plan in the next five years so that assured irrigation is ensured.
2	Water Resources	<ul style="list-style-type: none"> • State Government may plan for water harvesting structures like farm ponds, check dams, watershed activities and popularize water conservation measures like drip/ sprinkler irrigation through line departments, Panchayats, NGOs, etc. • Micro Irrigation should be encouraged by providing appropriate incentives, creating awareness about the need for water conservation and efficacy for micro irrigation. • Expeditious completion of micro level survey in critical / over exploited blocks to facilitate credit flow to these blocks. • Creation of series of check dams in suitable locations in high range areas. • Formation of "Water Users Associations (WUAs)" to ensure efficient use of water and maintenance of these structures. • Keeping in view PMKSY and doubling of farmer's income by 2022, banks may provide more credit towards creation of MI structures and Micro irrigation systems.
3	Farm Mechanisation	<ul style="list-style-type: none"> • State Government may plan for water harvesting structures like farm ponds, check dams, watershed activities and popularize water conservation measures like drip/ sprinkler irrigation through line departments, Panchayats, NGOs, etc. • Banks may finance second-hand agricultural vehicles including tractors • Replication of Food Security Army model of Farm machination developed by KAU.
4	Land Development	<ul style="list-style-type: none"> • The Forestry and Agriculture Department may chalk out a time bound plan for planting of bamboo, reeds, cane and other riverine species along the river banks and canals which are susceptible to heavy erosion during monsoon. • The Departments of Agriculture and Land Development & Water Resources are implementing a large number of programmes on watershed development, reclamation of ravine lands and reclamation of saline soils, etc. This information needs to be shared with bankers through different fora like the SLBC, BLBCs, DLCC, DLRC, etc. • The positive features like participatory base level planning and Ridge to valley treatment technique successfully adopted in NABARD watershed projects implemented in Wayanad, Palakkad and Kasaragod under Prime Minister's special programme for distressed districts may be incorporated in watershed programmes being undertaken in the state. • Increased Mono cropping is leading to deterioration of soil health. Integrated farming that integrate livestock, crop production and fisheries that was traditionally practiced in Kerala may be revived. • Financing and adoption of modern farm machinery like laser leveller, zero tillage machine, bed planter, rotavator, etc., for conservation tillage that will help conserving water as well as improving soil health by retaining biomass may be encouraged.

Annexure IV
Critical interventions required in various sectors/sub sectors

		<ul style="list-style-type: none"> • A database of the soils of Kerala State is to be made available, indicating the different characteristics of the soils and the crops suited for them with the corrective measures needed for introducing alternate crops.
5	Plantation and Horticulture	<ul style="list-style-type: none"> • The Agriculture Department, CPCRI, KVK, ATMA, etc., may, in unison, promote training centres on grading, standardization, processing, value addition, agro techniques, Good Agricultural Practices, etc., to ensure realization of optimum prices for the produce. • The use of innovative technology assisted climbers developed by various universities and research institutions may be promoted more aggressively. • The potential of coconut water as a beverage, in addition to Neera needs to be tapped. • The Coconut producer companies established by the CDB should be nurtured, hand held and should be made a tool through which value chain interventions and product diversification should be attempted. • The price of natural rubber, which is vulnerable to international prices needs to be stabilized by appropriate policy measures at the Central Government level. • Value chain interventions through various models of aggregation, processing and marketing needs to be encouraged by providing appropriate monetary and non-monetary incentives. • Setting up of sector specific labour bank like that of trained coconut climbers created by CDB may be attempted by other Boards also. The guidelines on MNREGA could be leveraged for the purpose by the LSGIs. • Department of Agriculture may promote organic farming for value addition and export with the support of SHM, VFPC and District Industries Centre (DIC).
6	Animal Husbandry – Dairy Development	<ul style="list-style-type: none"> • Loans extended to Dairy farmers also may be considered for interest subvention. • Banks to finance setting up of primary milk processing units, taking advantage of subsidy available under various GoI subsidy schemes. • Field progeny testing programmes offers excellent scope for enhancement of productivity of milch animals, Govt. may think of incentivizing through milk unions, farmer producer organisations, etc., for implementing such programmes. • Government along with KLDB, Research Institutions to study the impact of climate change and prepare an action plan on “Climate Resilient Interventions in Dairy Sector”. • Government may think of having Climate Smart Livestock farming as one of the top agenda for future initiatives on livestock development. • Model schemes in dairy sector have been prepared by NABARD and are available in website www.nabard.org. Banks may adopt the same with suitable modifications to suit local conditions. • Feed and fodder are the major limiting factors in enhancing farm animal productivity as feeding cost will be more than 65% of the total cost of livestock farming. There is a need to strengthen the existing livestock farms to produce fodder seeds / fodder slips in large quantity and to improve productivity of green fodder. • Non-availability of good quality milch animals is one of the major constraints faced by the dairy development sector in the district. Cattle breeding farms may be set up in each Districts in the Govt/cooperative sector to take care of the problem. Promotion of good local breeds would help to reduce the overall cost as they are ecologically and fiscally sustainable in the long run.
7	Animal Husbandry – Poultry sector	<ul style="list-style-type: none"> • Setting up of Micro-hatchery at farm level • Empowering the small farmers with micro cage layer system whereby small number of birds can be reared in prefabricated metal cages, through intensive rearing and the egg collected, branded and marketed. • Promote Producer Companies with backward linkage of farm enterprises and forward linkage with the marketing / processing firms both in the Public/ Private Sector.

Annexure IV
Critical interventions required in various sectors/sub sectors

		<ul style="list-style-type: none"> Considering broiler farming as an agricultural activity, the electricity rate shall be fixed at agricultural tariff.
8	Animal Husbandry – Sheep, Goat, Piggery sector	<ul style="list-style-type: none"> Capacity of the existing goat/ pig breeding farms of the Government, KSPDC and Meat Products of India may be increased to meet the increased demand for goat kids, piglets and chickens. Frequent outbreaks of diseases like FMD, BQ, PPR, Swine fever, etc., continue to reduce productivity and production. Availability of veterinary support in terms of infrastructure (for hospitals) is qualitatively insufficient. Therefore, modernization of such physical infrastructure may be planned by State Govt, with financial assistance through NABARD under RIDF. The database of the bovine population of the State would be codified for efficient animal health control and vaccination programmes, proper traceability in the case of outbreaks of trans boundary diseases, genetic improvement and cross breeding with the help of modern technologies such as RIDF. Organized slaughtering facilities are inadequate and strategic investments are needed for exploiting the full potential under meat sector, and Govt may think of having modern Abattoirs. Livestock insurance and Livestock extension services needs to be improved through public sector and private sector participation. The goat rearing shall be taken up through Farmers, JLGs, SHGs/ Kudumbashree and tribal groups particularly in hilly tracts with support from local bodies.
9	Fisheries	<ul style="list-style-type: none"> In order to support the fishermen community, Govt. of Kerala may consider providing interest subvention on the loans extended by banks to fishermen for procuring inputs, working capital, marketing etc. either directly or through agencies like MATSYAFED. The state has rich resources of indigenous ornamental fish in various river systems that have the potential to earn income for the state. MPEDA is providing assistance for ornamental fish breeding and export. Large scale operations may be adopted. Creation of adequate integrated/ landing and berthing infrastructure in region specific manner taking into account of marketing, processing and cold chain requirements. Department of Fisheries may promote new and innovative technologies with the support of CMFRI on cage farming, poly culture of brackish water fishes, mono culture of air breathing fishes, specific pathogen free tiger shrimp farming, fish culture in RAS (Aquaponics), all male tilapia culture, etc. Modern aquaculture technologies like cage culture, monosex Tilapia culture, Mono sex Scrampi culture etc. may be promoted. Aquaculture of high value fresh water species in inland waters and diversify exports. The insurance schemes need to be liberalised and norms to be made farmer friendly. Department of Fisheries may promote new and innovative technologies viz., cage farming, poly culture of brackish water fishes, mono culture of air breathing fishes, specific pathogen free tiger shrimp farming, fish culture in RAS (Aquaponics), all male tilapia culture, etc. Government may think of floating insurance schemes similar to Crop Insurance Scheme for aqua clusters of small aqua farmers, fish seed nursery operatros, etc.
10	Agriculture Infrastructure	<ul style="list-style-type: none"> Creation of appropriate legal framework and land acquisition policy for infrastructure projects Government may explore the possibility of allocation of land from the common pool land available with panchayats, taluks for creation of warehouses. The land / godowns available with the PACS could also be used for storage Time bound schedule for documentations like licences / registration certificates Market Yards, Cold Storage, Agriculture Marketing Infrastructure including

Annexure IV
Critical interventions required in various sectors/sub sectors

		<p>modern hi-tech abattoirs and meat processing units may be promoted by the Panchayat Raj Institutions in association with the developmental agencies, financing institutions including NABARD under RIDF.</p>
11	Food & Agro Processing	<ul style="list-style-type: none"> • Most of the units are in unorganised sectors and hence it is necessary to form Clusters to bring these units under a formal set up. • Government may consider setting up Special Economic Zones (SEZs) and Agri Export Zones (AEZs) and mega food parks for providing the needed infrastructure for small scale units. • More clusters/FPOs are to be promoted for products based on Paddy, Animal Husbandry, Apiary, Poultry, etc. • There is a need to establish a specialised Government Agency to promote agro processing sector in the State. • Creation of a minimum critical scale of infrastructure (backward and forward linkages) to prevent erosion in value. • The single window approach for Government clearances may need to be in place. • Establishment of medium level coconut processing units and agri processing units for indigenous fruits and vegetables like, jackfruit, pineapple, mango at block level with the help of local bodies in JLG/cluster mode and later on converting them into Producer Organizations is an urgent need in the district. The scheme run by State SFAC may be utilized for this purpose.
12	MSME	<ul style="list-style-type: none"> • A sizeable number of SMEs in the manufacturing sector are located in developmental areas/parks and small industrial parks. Upgradation of infrastructure in these clusters needs to be undertaken • Industrial clusters have an important role to play in the promotion of MSME due to their inclusiveness, technology absorption, efficiency improvement and availability of common resources. • Setting up of an “MSME Equity participation Fund” for encouraging start-ups to be created by the State Industrial Development Corporation and State Financial Corporation • Organisation of Industrial Adalats regularly at State/District levels with a view to understanding the problems of MSMEs and settle pending issues. • Government may introduce new technology, professional marketing and integrated quality management techniques in traditional sectors like Khadi & Handloom for upgradation of the present units to enhance productivity. • Staff training and the vocational and continuous on-the-job-training ensures a constant upgradation of workers’ skill. Govt may think of giving training under Skill India programme through institutions like MSME-Development Institutes, KVIC, Coir Board and National Small Industries Corporation, MSME Development Institute etc.
13	Renewable energy & solid waste management	<ul style="list-style-type: none"> • Government may think of giving incentives to the households and offices who are using Renewable Energy for their use. • Government to encourage generation of wind, solar and small and medium hydro projects. • Policy makers may think of having a stipulation regarding installation of Solar Panels in new buildings similar to the norm regarding compulsory Rainwater Harvesting system with all new buildings. • Rural housing loan policy may be redesigned to include a promotional component for installing solar power lighting & heating systems. • Setting up of units for treatment of solid waste by the PRIs, NGOs and Developmental Agencies, may be supported by banks.
14	Infrastructure	<ul style="list-style-type: none"> • Government to create -- post-harvest infra facilities for fisheries sector; infrastructure for industrial growth centres; core infra for e-governance; improved infrastructure facility in rural areas under health, social infra etc. • A comprehensive infrastructure development action plan for tribal areas & backward areas covering agriculture, social and connectivity sectors may be prepared and implemented over a period of 3 to 4 years.



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- > **Covers 125 districts in 12 States and a Union Territory**
- > **Entering into Eastern Region i.e. West Bengal, Odisha & Bihar.**
- > **Supported 1,35,000 SHGs/JLGs or 15 lakh households across its operational geography.**
- > **Cumulatively credit disbursement to the tune of around Rs. 4,746 crore.**
- > **Providing sustainable livelihoods to rural poor for uplifting their living standard**



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- GIS-based Mapping

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