

Sustainable Development of Coconut Sector in Kerala: Status and Strategies

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Background

Coconut sector plays a vital role in the agrarian economy of Kerala, besides its unique place in the socio-cultural fabric of the state. Kerala is ranked first in both area and production of coconut in the country. Coconut occupies about 30% of the total cropped area in the state and coconut sector accounts for around 15% of the gross value output (agriculture) of Kerala, thus inextricably linked to the agricultural economy of the state. It is estimated that there are about 3.5 million holdings and at least five million people depend on this crop directly or indirectly for their employment and livelihood. However, the 'land of coconut' is gradually losing its supremacy in coconut production scenario of the country due to various factors and Kerala's share in area as well as production of coconut has been declining over time.

Status and strategies for the sustainable development of coconut sector in Kerala state is discussed in this paper.

Trend in coconut production

In the year 1956, the year of formation of the state, Kerala had accounted for 69 per cent area and 73 per cent production of coconut in the country. But, its share in area and production of coconut has been reduced to 35% and 33% respectively by the

Year	Area ('000 ha)	Production (million nuts)	Productivity (nuts/ha)
2000	925.8	5536	5980
2005	897.8	6326	7046
2010	788	6239.5	7918
2015	770.62	7429.39	9641
2020	768.81	6942.6	9030

Table 1. Coconut cultivation in Kerala state during the last 20 years (Source: Department of Agriculture & Co-operation, Ministry of Agriculture & Farmers Welfare, Govt. of India)

year 2020-21. As per the 2020-21 statistics, area under coconut in Kerala state was 7.68 lakh ha and the annual production was 6942.6 million nuts with a productivity of 9030 nuts per ha (Table 1). Area under coconut in Kerala is also on the decline. During the year 2000-01 coconut was cultivated in Kerala in 9.2 lakh ha which has been reduced to 7.68 lakh ha in 2020-21 indicating a 16% reduction in area under coconut cultivation in the state over the last 20 years.

Yield gap in coconut in Kerala

Though there is an increase in productivity of coconut in Kerala state from 5980 nuts/ha in 2000 to 9030 nuts /ha in 2020, it is still below the national average (9430 nuts/ha), which is a matter of concern. Studies have indicated that the yield gap is very wide in coconut in all the Agro-Ecological Units in the state

Sl. No.	Agro-Ecological Unit	Average yield (nuts/palm)	Potential yield (nuts/palm)	Yield Gap Index
1	AEU 1	33	147	3.35
2	AEU 2	46	180	2.91
3	AEU 3	52	150	1.88
4	AEU 4	36	195	4.44
5	AEU 5	26	146	4.61
6	AEU 6	52	91	0.75
7	AEU 7	41.5	152	2.66
8	AEU 8	33	175	4.3
9	AEU 9	35	109	2.11
10	AEU 10	50	160	2.2
11	AEU 11	48	191	2.97
12	AEU 12	37	112	2.02
13	AEU 13	52	143	1.75
14	AEU 14	39	76	0.94
15	AEU 15	56	186	2.32
16	AEU 16	27	100	2.7
17	AEU 17	45	70	0.55
18	AEU 18	110	250	1.3
19	AEU 20	88	250	1.84
20	AEU 21	42	200	3.76
21	AEU 22	61	200	2.3
22	AEU 23	63	120	0.9
	Average	48.75	154.68	

(Source: Department of Agriculture & Co-operation, Ministry of Agriculture & Farmers Welfare, Govt. of India)

where coconut is cultivated (Table 2). In some AEU's it is as high as 4.61.

Better technology integration is essential for enhancing the efficiency of coconut sector. Systematic research in coconut in India has resulted in substantial number of viable technologies for enhancing income from coconut farming. These include high yielding hybrids and improved varieties, coconut based multiple cropping and integrated farming system models, agro-techniques for higher productivity including nutrient management, irrigation and water management, integrated pest/disease management and value addition through product diversification. However, the field level adoption of improved coconut technologies is not at a satisfactory level owing to various techno-socio-economic reasons. Hence, redemption of the traditional coconut farming and reorientation towards profitable ventures is becoming a necessity.

Sectoral challenges

Constraints such as high level of market fluctuation/ price crash in coconut, changes in the demographic characteristics of coconut growers with a shift towards absentee landlordism, predominance of senile and unproductive palms, predominance of small and marginal holdings, over populated stands of both coconut and other trees in the homesteads, low level of adoption of crop management practices resulting in low productivity, depletion of natural resources in coconut gardens and soil related constraints, inadequate irrigation facilities, lack of availability of quality planting materials, lack of skilled labour and high wage rate, crop loss due to incidence of various pests and diseases, low level of product diversification etc. adversely affects coconut farming in the state, and as such coconut has become a neglected crop. Hence, appropriate research, extension and policy interventions are to be formulated and implemented to enable coconut growers to alleviate these constraints and steer the sector towards achieving the goal of sustainability.

Strategies for sustainable development

Effective strategies and congenial policy environment are needed to improve efficiency of coconut sector in the state as discussed below.

i. Production of quality seedlings for coconut rehabilitation

The foremost strategy for improving the coconut production in Kerala is the massive cutting and



removal of senile and disease affected coconut palms which are beyond recovery, removal of over aged palms; regulating the palm density and replanting with high yielding planting materials along with adoption of suitable agro-management practices in farmer participatory cluster mode. Replacing old palms will require enormous quantity of seedlings. Hence, urgent action should be initiated for replanting such seed gardens with parental lines of new and improved varieties recommended for the respective regions. Further, to increase the capacity for hybrid seedling production, a decentralized production mechanism is to be envisaged by maintaining a centralized pollen storage and supply mechanism. In Kerala, on an average 30 lakh coconut seedlings are required annually. But the public sector institutions including State Department of Agriculture, CDB, CPCRI and KAU put together could supply only about 10 lakh seedlings per year, revealing a huge gap between demand and supply. The major constraint in enhancing production under public sector is the limited number of mother palms available with them. Many seed gardens established are facing various problems that have resulted in further reduction in number of palms. Rejuvenation of these seed gardens by planting mother palms of newly released varieties requires immediate attention. The existing mother palms in such seed gardens are nearing senility. Hence, urgent action should be initiated for replanting such seed gardens with parental lines of new and improved varieties recommended for the respective regions. Further, to increase the capacity for hybrid seedling production, a farmer participatory decentralized production mechanism is to be envisaged by maintaining a centralized pollen storage and supply mechanism. The three tier Farmer Producer Organisation system of Coconut Producer

Society-Coconut Producer Federation-Coconut Producer Company facilitated by CDB can play a significant role in the decentralised coconut seedling production programmes. The implementation of two pilot projects in 12 districts by ICAR-CPCRI with the support of State Department of Agriculture during the period from 2017 to 2020 with focus on utilisation of elite mother palms available in farmers' gardens has clearly indicated the efficacy of decentralised participatory approach for production and distribution of coconut seedlings. It is also necessary to ensure quality control in the production and distribution of coconut seedlings to prevent unscrupulous elements exploiting coconut growers. Hence, it is important that an appropriate nursery accreditation mechanism is established and accreditation made mandatory for all coconut nurseries. The desired ratio of coconut palm population of tall/dwarf/hybrid varieties in farmers' gardens i.e about 60 per cent tall, 20 per cent each of dwarf and hybrids need to be emphasized and accordingly appropriate short term and long term strategies are to be formulated and implemented for production and distribution of coconut seedlings.

ii. Promoting coconut based intercropping and integrated farming

The strategy for revitalising coconut sector in Kerala needs to revolve around interventions for ensuring adequate care and management of coconut palms in the existing gardens to enhance productivity and income. CPCRI has developed many coconut based multiple cropping and integrated farming system models which are more efficient in utilising the basic natural resources and realise more income compared to monocropping of coconut. A coconut based mixed farming system comprising coconut, pepper, banana, crossbred cows, poultry birds, goat, and pisciculture has proved to generate returns up to three times higher than that of coconut monocrop. In addition to the economic benefits, the systems ensure food and nutritional security coupled with sustainability and environmental services. In Kerala, the average size of coconut holding is only 0.2 ha and income from such tiny holdings can't meet the diverse needs of farm families. Hence, systematic coconut based cropping/farming system as a strategy to make coconut farming economically viable in small holdings needs to be highlighted. Implementation of development schemes to popularise coconut based cropping/farming systems is highly relevant since coconut growers in Kerala are currently more exposed



to economic risks and uncertainties owing to the high degree of price fluctuations.

iii. Enhancing productivity and income through technology integration

Increasing productivity and reducing cost of cultivation through better utilisation of crop management technologies in the existing coconut gardens is an important strategy to be implemented for enhancing income from coconut farming. Studies have indicated that the extent of adoption of recommended crop management practices in farmers’ gardens is not at a satisfactory level. Results of a recent study conducted by CPCRI in 1032 selected coconut gardens from four districts of Kerala state on the adoption of recommended technologies is furnished in Table 3.

Adoption of proper spacing to maintain optimum

Sl. No.	Crop management practice	Extent of adoption (%)
1.	Improved varieties	8.98
2.	Spacing for optimum plant density	32.59
3.	Inter/ mixed cropping	47.49
4.	Mixed farming	27.68
5.	Soil and water conservation techniques	38.36
6.	Irrigation	51.83
7.	Nutrient application as per soil test based recommendation	11.97
8.	IPM	29.42
9.	IDM	8.75
10.	On farm recycling of biomass	31.66

Table 3. Extent of adoption of crop management practices in coconut

palm density is essential to realise production potential of coconut palms. But in Kerala it is observed that there are on an average more than 100 palms per acre of coconut garden resulting in overcrowding of palms leading to low productivity. Hence, while implementing interventions for rehabilitation of coconut orchards it is necessary that emphasis is given for adopting recommended spacing of coconut palms.

Studies on fertility of soils of Kerala have revealed that soil related constraints viz., very strong soil acidity, extensive deficiency of secondary nutrients calcium and magnesium and wide spread deficiency of micro-nutrient boron are among the important factors for low productivity of coconut in the state. Hence, it is important that interventions are implemented for improving soil health status in coconut gardens through soil test based nutrient management. Under the network project implemented during the period from 2015 to 2019 with the support of State Planning Board, Government of Kerala in selected agro-ecological units in Kerala it was revealed that 49% improvement in productivity could be achieved through scientific soil health management practices including soil test based nutrient management. The technology for vermicomposting of coconut leaves as part of on-farm organic matter recycling in coconut gardens is very relevant in the context of growing awareness about organic farming/eco-friendly farming in Kerala. Coconut gardens of one hectare area can generate up to eight tonnes of leaf biomass residues every year which can be utilised for vermicompost production. The coconut leaf vermicompost can also meet 50% of the nitrogen requirement of coconut palms grown in one hectare area, saving expenditure on inorganic fertilizer. Basin management with green manure legumes is another approach for enhancing the availability of organic manure.

Drip irrigation is the ideal method of irrigation for coconut. Hence, schemes to promote adoption of drip irrigation in coconut gardens assumes much significance, especially ‘more crop per drop’ is the strategy accepted worldwide for sustainable crop production. It is also important to implement schemes to promote adoption of soil and water conservation and water harvesting in coconut gardens for enhancing coconut productivity. There was 19 per cent improvement in yield of coconut due to the implementation of various interventions related to soil and water conservation under the Farmer Participatory Action Research Programme (FPARP)

implemented by CPCRI with the support of Ministry of Water Resources in selected localities of Kasaragod district.

Crop loss due to incidence of pests and diseases is one of the major constraints experienced by coconut growers in Kerala. Though viable technologies on palm health management amalgamating integrated pest and disease management with nutritional care of the palm are made available, due to various reasons the field level adoption of technologies recommended for the integrated pest management (IPM) and integrated disease management (IDM) of coconut is very low and as such crop loss due to incidence of pests and diseases continues to incur huge economic loss for the coconut growers. According to an old estimate the annual loss due to the incidence of root (wilt) disease alone was 968 million nuts in the state. The technical feasibility and economic viability of IPM/IDM technologies to manage rhinoceros beetle, red palm weevil, bud rot disease etc were successfully demonstrated in farmers' field at different localities under various action research projects implemented by ICAR-CPCRI ensuring active involvement of coconut farmers and other stakeholders. Community/group approaches ensuring active participation of farmers are needed for the effective implementation of integrated pest/disease management in coconut. Hence, interventions are to be implemented to promote community approach and farmers'



participation to enhance adoption of IPM/IDM in coconut. It is important to ensure the participation of coconut palm climbers in the implementation of technology transfer programmes on IPM/IDM in coconut. Besides, involvement of Coconut Producer Societies, Agro Service Centres and rural youth trained under Friends of Coconut Trees (FoCT) programme of



CDB is to be ensured for the effective implementation of schemes on plant protection in coconut under the decentralised planning programme by Local Self Governments.

iv. Upgrading the value chain

Technological research has been successful in evolving appropriate processing technologies for the profitable utilization of products and by-products of the coconut palm including tender nut, coconut kernel, coconut water, coconut wood, shell and leaves. To cope with the market fluctuations, there is a need for product diversification and by-product utilization. Encouraging more entrepreneurs in coconut sector by establishing 'Coconut Parks' for organized processing for value addition will help coconut farmers to de-link the over dependence on coconut oil in determining coconut price. In the case of Kerala, there is tremendous potential for the development of coconut sector especially in view of the investment friendly ambience due to the organized coconut farmer groups. The synergy of these farmer producer organisations can be effectively channelized for harnessing the potential for production and marketing of coconut value added products. The formation of coconut parks will indubitably provide new impetus to the Kerala coconut industry by ensuring income enhancement of the farmers and other stakeholders.

A recent study conducted by CPCRI in Kasaragod district revealed that major constraints experienced by coconut based enterprises to effectively manage the enterprises are marketing difficulties and lack of availability of raw materials. Financial constraints, inadequate infrastructural facilities and cumbersome licensing procedures were other important constraints faced by them. Steps such as expanding

of the marketing channels, adoption of innovative value added products, advanced machineries and technologies to enhance efficiency of enterprises, popularizing the coconut products through different advertising modes and to make available financial and technological support from government including handholding of enterprises to tide over difficulties during the initial stages of the enterprises are necessary to enhance efficiency and to sustain the coconut based enterprises.

v. Policy interventions in trade and marketing

Not ignoring the fact that, the integration of international and regional coconut markets indeed in a big way influenced the demand and price movement in Kerala and represent an important challenge to the millers with respect to the cheaper raw materials from neighbouring states. In this context, there is a larger ongoing 'crisis narration' wherein we argue that the cheap import of palm oil is the major cause of price instability of the coconuts in Kerala. Though it is partly true, we need to undertake a close scrutiny of this aspect. There have been umpteen pre-existing and proven advocacies to address such issues, like tariff restructuring, cluster formation, group synergy and value addition. On the contrary, most importantly we need to seriously address the issue of labour scarcity that demands novel policy interventions. Moreover we need to address the issues largely felt at meso and micro level like disorientation from coconut farming, the regional patterns of coconut cultivation, the domestic consumption pattern of coconut and coconut products, the functioning of domestic coconut value chains etc. The way in which the labour market is socially structured may prove challenging for newly trained climbers, wherein, for them, it would be difficult to access the regular employment. The field level findings necessarily validate this argument.

Raw coconut procurement can be implemented effectively as an ad-hoc regulatory measure. But as of now only meagre share of farmer produce gets support due to inadequate procurement, delay in payment and transaction drudgery that all leads to distress sale of the produce. With respect to this we need to improve the infrastructural and storage facilities of Krishi Bhavans. Alternatively we can think of establishing procurement hubs at panchayath levels using the vast network of established CPSs. We need to create a sort of accountability among the societies and also encourage them to proactively undertake the minimal processing.



Price spread analysis of coconut marketing revealed that near about 70 per cent of the farmers sell their produce through the village traders as raw coconuts. Less marketable surplus due to small and marginal holding size is the major reason for the farmers for not undertaking copra or oil for sale. In Kerala conditions, which are the same in many countries with predominantly small holder coconut gardens, the producer share in consumer rupee was found to be around 64 per cent and the market chain consumes as much as 36 per cent share in the total value chain. Higher price spread always indicates a lower share of the final price to the producer. In other words it reflects the low marketing efficiency of the market channel. The price spread and marketing efficiency can be improved only through collective and constant efforts in terms of adoption of higher value addition technologies at individual or group level.

Further, a regional trade agreement among major plantation crop producing countries should be facilitated at the policy level. The modalities for such a commodity-specific trade agreement should be worked out with the utmost care, wherein we should end up in a win-win situation. In this respect, we need to thoroughly analyse the existing tariff structure of each country on the specified plantation crops, and an unbiased tariff reduction schedule should be proposed. It is also essential to consider the existing tariff structure of close substitutes/ competing products of each country, thereby arriving at a consensus.

vi. Labour availability

Lack of skilled palm climbers and their high wage rate is a major constraint experienced by coconut growers. Hence, it is important to promote labour banks of rural youths trained in palm climbing and crop management practices at the grass root level and also to strengthen already existing Agro-Service Centres facilitated by State Department of Agriculture by providing more coverage to interventions related to coconut farming. Service of rural youth trained under the 'Friends of Coconut Trees (FoCT)' programme implemented by Coconut Development Board has to be effectively utilized in the implementation of

interventions for coconut development. Besides, there is a need to strengthen research for developing a simple and safe palm climbing device.

vii. Promoting group approach

In Kerala, coconut is predominantly cultivated in small and marginal holdings. The income generated from coconut farming in small and marginal holdings does not provide enough for meeting the requirements of farm families. Technology options for enhancing income from coconut farming in such poor rural communities do exist, but not fully realised in field situation. The fragmented holdings do not render themselves viable for the optimum utilization of resources and the adoption of improved technologies by the cultivators. To augment the productivity and income of such small and marginal holdings it is suggested to have group management of resources, which helps to overcome the inherent weaknesses of the fragmented holdings. Various agencies, including Coconut Development Board and State Department of Agriculture, have thus facilitated farmer producer organisations to promote group approaches for implementing coconut development interventions. Kerala has about 7232 Coconut Producers' Societies (CPS), 467 Coconut Producer Federations (CPFs) and 29 Coconut Producer Companies (CPCs) already

Sl.No.	District	No. of Coconut Producer Societies	No. of Coconut Producer Federations	No. of Coconut Producer Companies
1	Kasaragod	580	33	2
2	Kannur	498	29	2
3	Kozhikode	1807	117	9
4	Wayanad	115	9	1
5	Malappuram	1308	99	5
6	Palakkad	458	26	1
7	Thrissur	477	26	2
8	Ernakulam	224	15	1
9	Kottayam	276	21	1
10	Idukky	182	15	-
11	Pathanamthitta	26	2	-
12	Alappuzha	719	50	2
13	Kollam	255	11	1
14	Thiruvananthapuram	307	14	2
	Total	7232	467	29

Table 4. Three-tier Coconut Farmer Producer Organizations in Kerala coconut
(Source: Coconut Development Board, Kochi)

registered with CDB, besides the FPOs of coconut growers facilitated by State Department of Agriculture as part of implementing 'Keragramam' project.

The FPOs in coconut sector are to be supported and strengthened to enable them to mobilise group action for implementing various interventions to improve coconut sector. Many a times it is observed that the FPOs are unable to organise any meaningful activities with group approach, instead act as intermediaries facilitating distribution of incentives under schemes implemented by governmental agencies. Though there are large number of FPOs in coconut sector in the state, many of them have become defunct due to various reasons, especially due to lack of continued support to sustain their activities. Discontinuance of large number of Neera based enterprises managed by FPOs indicate the need to implement interventions to revitalise the farmer collectives in coconut sector. The biggest challenge in Kerala context is to enhance productivity through adoption of crop management technologies in a substantial number of coconut

orchards (which are almost neglected) owned by 'absentee landlords' whose primary source of income is not coconut farming. Policies and programmes to facilitate revival of such coconut holdings needs community action at grass root level with the support of governmental agencies. The FPOs can play a role in linking trained skilled palm climbers and coconut farmers by promoting labour bank concept under decentralized people's planning by LSGs to address the problem of shortage of labour and high wage rate.

Conclusion

Coconut sector in Kerala state is confronted by many challenges. But there are opportunities to combat and conquer the obstacles and steer the sector to a profitable, vibrant and sustainable road map. Concerted efforts by various research, development and extension agencies, active participation of coconut growers along with a congenial policy environment are needed for the effective implementation of interventions for the sustainable development of coconut sector in the state.

Advertisement Tariff of Coconut Journals

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