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Coconut Sector in Kerala-Trends and Challenges

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Abstract

The coconut economy in Kerala is plagued with challenges like reduction in area under cultivation, low productivity, increasing cost of cultivation, price volatility and unstable exports. This paper critically examines the challenges faced by the coconut sector in Kerala. The price behaviour of coconut and coconut products revealed that the prices are extremely volatile and the prices of coconut and copra are closely related with the price of the coconut oil. The analysis of coconut exports showed that the products with higher export instabilities were the products with higher shares in exports like activated carbon, fresh coconut, copra and coconut oil. It was also observed that the production of value-added products in coconut and its awareness were very low in the country. Some of the effective steps suggested were mechanisation of coconut farming, market intelligence and price forecasting schemes, revision of import duty structure of edible oils and awareness campaigns on various value-added products of coconut.

Keywords: Coconut, copra, coconut oil, area, production, volatility, value addition, export, tariff

JEL Classification: Q11, Q10, Q13

Introduction

Coconut is one of the important plantation crops cultivated in India. Every part of coconut palm, *viz.,* the kernel, shell, wood, water etc., has a reasonable economic and market value. Due to its versatile uses, coconut is known as the tree of abundance or '*Kalpavriksha*'. India is one of the top three producers of coconut in the world, with 23 percent of the production and occupying 18 percent of the area, following Indonesia and Philippines in 2019 (CACP, 2021b). India has produced 20,309 million nuts from 2.17 million ha with a productivity of 9345 nuts per hectare in the year 2019-20 (CDB, 2021). Coconut had contributed about ₹12,249 crores (at constant prices) to the country's total value of output in 2018-19, of which Kerala accounted for 34 percent (CSO, 2021). It also provides food security and livelihood opportunities to 12 million people in India (CACP, 2021b).

The four southern states, Kerala, Karnataka, Tamil Nadu, and Andhra Pradesh, are the country's main coconut growing areas, together accounting for 90 percent of the area and production. Among the major coconut growing states, Kerala has the longest history of coconut cultivation. In terms of area under cultivation, coconut is the most important crop grown in Kerala, with over 0.76 million hectares under cultivation. It accounts for the largest share of 29.41 percent in the gross cropped area (CDB, 2021; DES, 2021). But, Kerala's share in total area and production of coconut in India has been declining over the years. In Triennium Ending (TE) 1972-73, 68 percent of the country's total area and 65 percent of coconut production were in Kerala, which almost halved to 36 and 38 percent respectively in TE 2019-20. The other major producing states such as Karnataka, Tamil Nadu and Andhra Pradesh have doubled their shares by discernibly increasing their area and production (CDB,1998; CDB, 2021). Despite being first in acreage and production in the country, Kerala with a productivity of 9915 nuts/ha in TE 2019-20, was lagging behind other coconut producing states (CDB, 2021). In this paper, a critical analysis of the various challenges for the coconut economy of Kerala is carried out.

Data Sources and Methodology

This paper examines various challenges affecting the coconut sector of Kerala, analyses the dynamics in the area, production and productivity of coconut, cost of cultivation, and price behaviour of coconut and, coconut products in various markets of Kerala.

The data on area, production, and productivity of coconut from 1970-71 to 2019-20 and monthly prices of coconut and coconut products in different markets of Kerala from 1980 to 2020 were sourced from the Coconut Development Board (CDB), Kochi. The data on the cost of cultivation

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2000-01 to 2018-19) was collected from the Directorate of Economics and Statistics, Kerala and data on exports were obtained (1996-97 to 2019-20) from the Export-Import Data Bank, Ministry of Commerce and Industry, India. The instability in coconut exports was studied using Coppock's instability index. The past studies on the reasons for the low productivity of coconut in Kerala, price behaviour of coconut and coconut products, the impact of free trade agreements in the edible oil sector and challenges faced in value addition were critically reviewed and optimally utilised for the present paper (GOK, 2021a; Thamban *et al*, 2016; Jnanadevan, 2018).

Results and Discussion

Dynamics in area, production and productivity of coconut

In India, the area under coconut had steadily increased from 1.04 million ha to 2.17 million ha, with production rising from 6,124 million nuts to 20,309 million nuts from 1970-71 to 2019-20 The productivity surge was from 5811 nuts/ ha in 1970-71 to 9345 nuts/ha in 2019-20 (CDB, 1998; CDB, 2021).

The area, production and productivity of coconut have been stagnant from 1970-71 to 1982-83, with occasional fluctuations in some of the years (Figure 1). From 2005-06, the productivity began to increase, while there was stagnation in the area under cultivation of coconut. It can be observed that from 1982-83 to 2000-01, the increase in the area of coconut was more than that of the increase in productivity. This increase in the area in India could largely be attributed to states like Karnataka, Andhra Pradesh and Tamil Nadu. The peak production of coconut was observed in the year 2016-17, which had decreased in the subsequent years due to the cyclone 'Gaja' and whitefly infestation in Tamil Nadu, coupled with pest and disease infestations and weakened monsoon in Karnataka (CACP, 2021b).

Kerala occupied the first position in the area and production with 0.76 million ha and 6980.36 million nuts respectively in the country in 2019-20. However, the state's productivity was comparatively lower than other major producers such as Andhra Pradesh (13,969 nuts/ha) and Tamil Nadu (12,280 nuts/ha). The highest productivity was observed in Maharashtra with 17485 nuts/ha in 2019-20. Nevertheless, there has been a significant improvement in the yield of coconut in Kerala from 5,572 nuts/ ha in 1970-71 to 9175 nuts/ ha in 2019-20 (CDB, 2021) (Figure 2). This improvement in yield was partly due to the 'Keragramam' project, which was undertaken from 2016-17 to 2019-20 as part of the Coconut council that was started for the rejuvenation and revitalization of coconut holdings (GOK, 2021b). But then the floods in 2018 and 2019 had led to huge losses in the coconut economy as large areas of coconut were destroyed. About 30,945 ha of perennial crops were destroyed in Kerala in the floods (GOK, 2021a).

Comparison of district-wise productivity of coconut in Kerala during TE 2001-02 and TE 2018-19

In TE 2001-02, the state's average productivity of coconut was 6056 nuts/ha and ten districts of the state were below the average state productivity and four districts were above the state's productivity, whereas in TE 2018-19, the average productivity of the state increased to 6910 nuts/ha with the number of districts above the average productivity increasing to five and those which were below the state productivity decreasing to nine (Table 1).

It was observed that the productivity in Thrissur declined and it moved to the below-average group, while the productivity in Malappuram and Palakkad improved and these districts were in the above-average productivity group in TE 2018-19. It could be observed that the negative and positive deviations have also increased in the second triennium. This points to the need to categorise these districts based on productivity deviations. Also, there is a requirement to identify the constraints in coconut cultivation and reasons for high/low productivity in these two groups of the districts separately and develop strategies for them.

Major reasons for low productivity in Kerala

According to GOK (2021a), the potential yield of coconut in Kerala in the mid-2010s was 150 nuts/ palm/ year, whereas the actual yield observed in Kerala was only 40 nuts/ palm/ year, pointing towards an alarming yield gap of 275 percent. The factors responsible alarmingly low productivity of coconut in Kerala are predominance of small

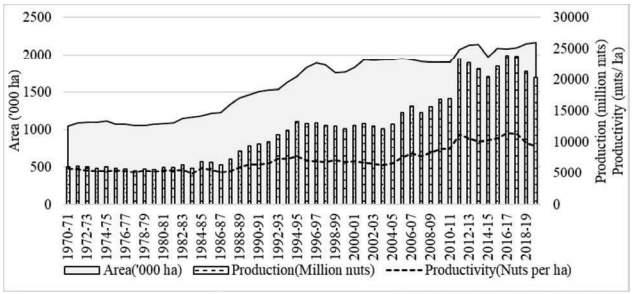

Fig. 1. Area, production and productivity of coconut in India

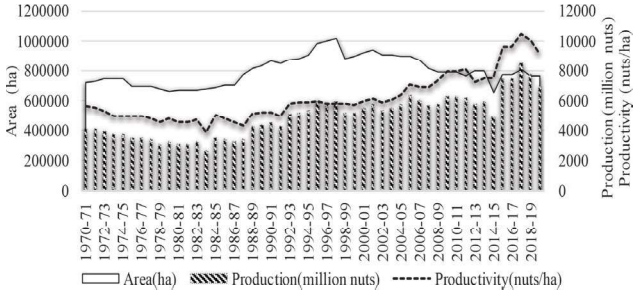

Fig. 2. Area, production and productivity of coconut in Kerala

Table 1. Productivity of coconut in different districts of Kerala (nuts/ ha)

Category	TE 2001-02	TE 2018-19
State average productivity	**6056**	**6910**
Districts below state productivity (Deviation from state productivity)	Wayanad (-2869)	Idukki (-2970)
	Idukki (-2239)	Ernakulam (-2526)
	Kottayam (-1408)	Kottayam (-1803)
	Alappuzha (-1003)	Alappuzha (-1488)
	Kollam (-884)	Pathanamthitta (-1199)
	Palakkad (-789)	Kannur (-1126)
	Ernakulam (-475)	Thrissur (-827)
	Pathanamthitta (-475)	Wayanad (-715)
	Malappuram (-19)	Kollam (-133)
	Kannur (-16)	
	(10 Districts)	**(9 Districts)**
Districts above state productivity (Deviation from state productivity)	Kasaragod (+1298)	Kasaragod (+2524)
	Kozhikode (+1268)	Malappuram (+1552)
	Trivandrum (+908)	Trivandrum (+1281)
	Thrissur (+395)	Palakkad (+514)
		Kozhikode (+128)
	(4 Districts)	**(5 Districts)**

and marginal landholdings, diseases like bud rot, root wilt; pests like eriophyid mite, red palm weevil, rhinoceros beetle and whitefly, non-availability of adequate planting material of new and high yielding varieties of coconut, inadequate irrigation facilities and scarcity of skilled labourers for farm operations (GOI, 2019a; CACP, 2021b; Thamban *et al,* 2016; Jnanadevan, 2018).

Cost of cultivation of coconut in Kerala

The cost of cultivation of coconut in Kerala was estimated using the Cost A, Cost B and Cost C concepts. The Cost A which consists of the cash and other kind expenses, was worked out as ₹11,903 per hectare in 2001-02 and ₹74,536 per ha in 2018-19 (Table 2), which increased by 625 percent during the period. The share of the hired human labour cost increased from 54.41 percent to 61.2 percent, which showed that a major proportion of the cost of cultivation was incurred for hired human labour (DES, 2002; DES, 2021).

It could be contended that the higher wage rates are due to the higher labour demand and this has led to the high cost of cultivation in Kerala. The wage rate prevailing in the State during 2020 was ₹744 per day, which was the highest among the major coconut producing states (CACP, 2020).

Costs and gross returns of coconut in Kerala

From 2001-02 to 2018-19, the value of output per hectare of coconut in Kerala increased from ₹22,920 per hectare to ₹1,37,470 per ha (Table 3). The gross returns over Cost A increased from 77 percent to 84 percent during the same period. When the cost of family labour was added to Cost A, the gross returns decreased to 61 percent and 71 percent in 2001-02 and 2018-19 respectively (DES, 2002; DES, 2021). In the present study, the gross returns over Cost A were calculated without adding the interest on fixed capital and land value. So, if we amortize the fixed cost and add on to the paid-out costs *i.e.,* Cost A, the gross returns will be further reduced and hence, the increase in gross returns will be far less. It can therefore be asserted that there is decreasing profitability of coconut cultivation in Kerala.

Price volatility of coconut and coconut products

In India, the demand for copra is determined mainly by the demand for coconut oil, which uses about 77 percent of copra. Hence it can be said that the market price of copra mostly depends on the price of coconut oil. Price of coconut oil is in turn influenced by several other factors such as seasonal and annual variation in coconut production and its use in the food and non-food sector, price of other substitute vegetable oils, trade policy for edible oils, world prices of edible oils in general and palm oil in particular. The prices of coconut oil in one-year influence the supply and price of copra in the subsequent year (Jnanadevan, 2018; CACP, 2020).

It was observed from the monthly price behaviour of copra, coconut and coconut oil from 1980-2020 that these

Table 2. Percentage distribution of 'Cost A' per ha of coconut in 2001-02 and 2018-19

Sl. No	Components of Cost A	2001-02		2018-19	
		₹/ ha	Share in Percent	₹/ ha	Share in Percent
1	Hired human labour	6477	54.41	45618	61.2
2	Animal labour	2	0.02	12	0.02
3	Machine labour	152	1.28	490	0.66
4	Seed / seedlings	19	0.16	496	0.67
5	Farmyard manure and chemical fertilizers	3351	28.15	17969	24.11
6	Plant protection	64	0.54	1	0.0
7	Land tax and irrigation cess	70	0.58	388	0.52
8	Repair and maintenance charges	190	1.6	314	0.42
9	Interest on working capital	1059	8.9	6459	8.67
10	Other expenses	519	4.36	2788	3.74
11	Cost A	11903	100	74536	100

Table 3. Average costs and gross returns of coconut in Kerala in 2001-02 and 2018-19

Year	Value of output	Cost A	Imputed cost of FL	Gross returns over cost A		Cost A+ FL	Gross returns over cost A + FL	
		₹/ ha		₹/ ha	Percent	₹/ ha	₹/ ha	Percent
2001-02	22920	12955	1267	9965	77	14222	8698	61
2018-19	137470	74536	9635	62934	84	84171	53299	71

Note: FL -family labour

series exhibited similar overall trends and hence could be concluded that the price of copra is linked with the price of coconut oil (Figure 3, 4 and 5). The prices have also shown an increasing trend from April 2009. The seasonality and cyclicality can be observed in the prices of coconut and coconut products. The seasonal pattern showed that the prices start to decline from March and were lowest in the month of June and July, coinciding with the South West Monsoon and thereafter increases and reaches the maximum in the months of November and December. The cyclical variations refer to the oscillatory movements in a time series. The cycles in coconut, copra and coconut oil prices were of varying lengths from four to six years and the length of cycles have decreased after 2010. Both seasonality and cyclicality are responsible for the price fluctuations observed for coconut and coconut products (KAU,2017)

Procurement operations in coconut

The Minimum Support Price (MSP) Scheme for milling copra and edible ball copra were introduced in 1986 for ensuring remunerative prices to coconut farmers. The National Agricultural Cooperative Marketing Federation of India Limited (NAFED) and National Cooperative Consumer Federation of India Limited are the Central Nodal Agencies (CNAs) for procurement of milling copra, ball copra and dehusked coconut under the Price Support Scheme (PSS) in the coconut growing states. Along with MSP based procurement, coconut and copra procurement are also aimed

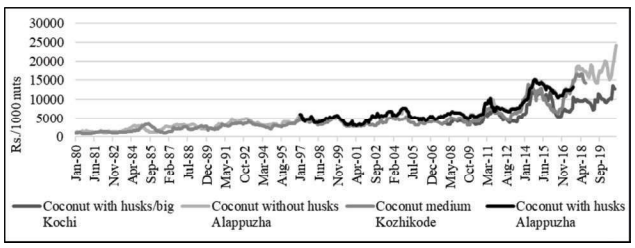

Fig. 3. Behaviour of coconut prices in Kochi, Alappuzha and Kozhikode markets of Kerala

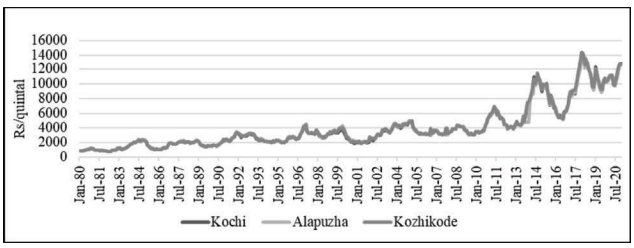

Fig. 4. Price behaviour of milling copra in Kochi, Alappuzha and Kozhikode markets of Kerala

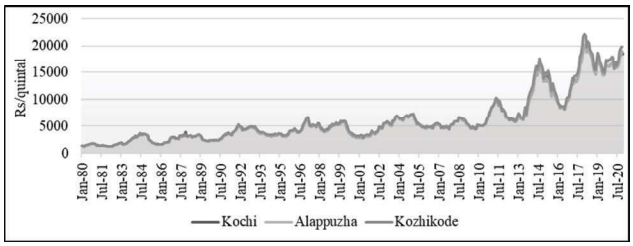

Fig. 5. Price behaviour of coconut oil in Kochi, Alappuzha and Kozhikode markets of Kerala

at providing price security to the coconut growers under PSS (CACP, 2020).

The majority of small and marginal coconut farmers do not benefit from government procurement operations under PSS as they don't have coconut shelling/ drying facilities as a result they are forced to sell their produce as raw nuts (Thasnimol, 2019; Jayasekhar *et al,* 2019; CACP, 2020). Other issues related to procurement of copra are:

I. Lower levels of MSP for copra

Coconut prices in India have been historically integrated with the coconut oil prices (Jnanadevan, 2018). Therefore, the coconut prices received by the farmers are integrated with the MSP of copra. Farmers prefer to sell raw coconut as the prices are attractive compared to copra and because they can avoid processing and transportation charges (Jayasekhar *et al,* 2019; Thasnimol, 2019). Hence a higher MSP for copra will act as an incentive for the primary value addition of coconut.

II. Sub-optimal level of functioning of copra procurement system

The copra procurement system in the country has always been functioning at the sub-optimal level and was never effective in lifting up the market prices to an optimum level (Jayasekhar *et al,* 2019). The NAFED had always failed to find a market avenue during huge procurement which often have led to market failures in the past. CACP (2020) observed that when the market prices went below the MSP in 2010 and 2012, the procurement operations were limited to create an impact on market prices.

III. Six months is not sufficient for procurement of copra

The market arrivals patterns in the country were found to be evenly distributed throughout the year and hence the current procurement time period of six months was not sufficient (CACP, 2021b).

IV. Few collection centres for procurement in rural area

Marginal and small coconut producers are unable to get benefit of the PSS operations as the procurement agencies are operating a few collection centres in remote areas (CACP,2021).

Trade policies for coconut products and edible oils

The multiplicity of Regional Trade Agreements (RTAs) and Free Trade Agreements (FTAs) with zero or low-rate tariff agreements have detrimental effects on India's coconut industry and trade of coconuts and products, as most of these countries are major coconut growing countries. Coconut oil competes with other oils such as soybean, palm, sunflower, rapeseed, corn oil etc. in the world market. Therefore, price of coconut oil is influenced by the supply and demand of competing oils. Coconut oil has high lauric acid content, which has particular advantages for food and industrial uses and receives a price premium over other edible oils. The average price of coconut oil was 132.7 percent higher than palm oil in 2018, although this difference declined to 110.8 percent in 2019 and further reduced to 74.3 percent in 2020. Coconut oil commanded a premium of 90 percent over soybean oil in 2018, which reduced to 59.3 percent in 2019 and 50.4 percent in 2020 (CACP, 2020).

In TE 2019, out of the total consumption of 249.86 lakh tonnes of edible oil, India had imported 145.23 lakh tonne,s of which 61.6 percent was palm oil (GOI, 2019b and GOI, 2021). The import of a huge quantity of palm oil is mainly responsible for the price volatility of coconut and its oil products (CACP, 2020). Coconut oil prices tend to be more volatile than palm oil and soybean oil prices. Therefore, relatively cheaper and stable prices of palm oil and soybean oil make coconut oil less attractive to consumers and exert downward pressure on domestic prices of coconut oil and thus, on copra prices. Since coconut oil usually trades at a premium price, there is a temptation to adulterate it with cheaper oils also (CACP, 2020).

Dynamics in the export of coconut and coconut products from India

India had mainly exported eight coconut products from 1996-97 to 2019-20. These are crude oil, refined oil,

Table 4. Minimum Support Prices Recommended by CACP and Fixed by Government (Crop Year) (₹/quintal) as on 09.09.2021

Commodity	2016-17		2017-18		2018-19		2019-20		2020-21	
	Reco	Fixed	Reco	Fixed	Reco	Fixed	Reco	Fixed	Reco	Fixed
Copra (Milling)	6500	6500	7500	7511	9520	9521	9960	9960	10335	10335
Copra (Ball)	6785	6785	7750	7750	9920	9920	10300	10300	10600	10600

Note: Reco -recommended

Table 5. Instability in the export of coconut products from India (Coppock's Instability Index)

Coconut product	1996-97 to 2007-08			2008-09 to 2019-20			1996-97 to 2019-20		
	Qty	Value	UV	Qty	Value	UV	Qty	Value	UV
Crude oil	221.11	206.93	45.58	1113.83	796.74	62.79	692.50	643.68	255.49
Refined oil	36.21	40.93	39.39	57.79	42.60	29.96	564.53	646.40	203.17
Desiccated Coconut	91.96	113.52	44.23	114.61	149.75	28.67	424.27	436.99	161.22
Coconut fresh	162.47	131.83	48.74	31.74	26.45	20.51	862.64	742.24	142.65
Coconut dried	58.01	61.62	39.99	59.63	58.32	28.96	634.76	665.77	178.54
Copra	1137.01	632.66	132.01	109.78	87.47	32.36	1075.63	884.14	236.11
Activated carbon	74.71	52.31	25.83	12.84	22.76	16.48	1054.56	1087.79	171.59
Coconut shell charcoal	99.56	78.76	36.97	137.84	63.74	100.93	676.01	496.65	152.44

Note: Qty- Quantity in '000 kg, Value in ₹ lakhs, UV- Unit value in ₹/kg

desiccated coconut, coconut fresh, coconut dried, copra, activated carbon and coconut shell charcoal. During TE 1999-00, refined coconut oil accounted for the major share in exports whereas, in TE 2019-20, activated carbon accounted for two-third share in the value of exports of coconut and coconut products from India, followed by dried coconut and fresh coconut (Figure 6).

The export of coconut from India was highly unstable both in quantity and value terms during the time period (Table 5). The instability in the value of exports was contributed by instability in quantity rather than unit value. It could be concluded from the study that the products with higher shares in exports like activated carbon, coconut fresh, copra and coconut oil exhibited higher export instabilities.

Challenges for value addition of coconut in Kerala

In Kerala, 90 percent of mature raw nuts is consumed for domestic purpose and a meagre ten percent is converted to value added products like desiccated coconut, coconut milk/ cream /powder and other products (Jnanadevan, 2018). Even in urban areas of Kerala, the awareness on the value-added products of coconut is very less. It was found that only 63 percent had awareness of desiccated coconut whereas it was 82 percent for virgin coconut oil (John and Ushadevi ,2020). Some of the other constraints faced by the value-added sector

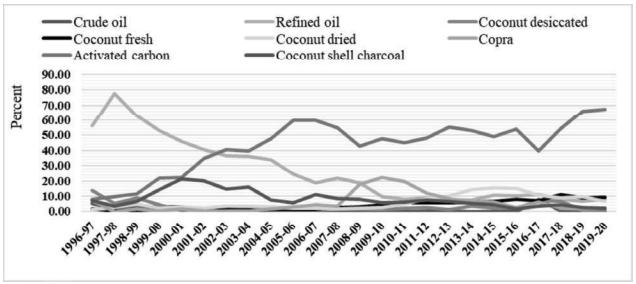

Fig. 6. Shares of different products in the export of coconut products from India

is the bulky nature of raw material which is specific to the coconut industry. This makes it costly to handle, store and transport the raw material. It also implies larger storage space for coconut-based industries, which translates into higher working capital requirement. Further, there is no organized market for coconut convenience products and hence, market promotional expenses tend to be relatively high, hindering the initiative of small entrepreneurs (CACP, 2020).

To address the challenges faced by smallholder producers, the CDB has been facilitating formation of three-tier FPOs, comprising of Coconut Producer Societies (CPSs) consisting of 40-100 coconut growers at Tier-1 level, Coconut Producer Federations (CPFs) by aggregating 8-10 CPS at Tier-2 level and Coconut Producer Companies (CPCs) at Tier-3 level (CDB, 2021). According to CACP (2020) there is immense potential for farmer collectives in the state which can play a major role in mitigating risks, economising on inputs, adopting best practices and ensuring remunerative prices through better bargaining, marketing and value-addition, if adequately are given support.

Conclusion and Policy Implications

The challenges faced by the coconut sector in Kerala are enormous. The decline in the area under coconut in Kerala has been obvious. The reduced profitability due to the increasing cost of cultivation, price volatility and instability in exports have resulted in an alarming situation for the coconut economy in India and Kerala. The major reason behind this debacle is the recent trade agreements with other major coconut producing countries. The value addition of coconut is still underdeveloped and the awareness on this is also limited. Some of the policy considerations to overcome the situation include the promotion of mechanisation of coconut farming in the State so as to increase the profitability of the coconut sector. Market intelligence and price forecasting schemes need to be carried out for coconut and coconut products so that it will help the farmers to tide over the

price uncertainties. There is also an urgent need to revise the import duty structure of edible oils. These steps will aid the coconut sector of Kerala to regain its lost glory.

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