VALUE CHAIN ANALYSIS (VCA) OF COCONUT BASED FOOD PRODUCTS

By

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(2014-11-149)

THESIS

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DECLARATION

I hereby declare that this thesis entitled **"Value chain analysis (VCA) of coconut based food products"** is a bonafide record of research done by me during the course of research and that the thesis has not previously formed the basis for the award of any degree, diploma, fellowship or other similar title, of any other University or Society.

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Dedicated to my dear Parents

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INTRODUCTION

Introduction

Coconut (*Cocos nucifera*) is an important crop cultivated widely across the world. There was a saying that "He who plants a coconut tree, plants food and drink, vessels and clothing, a habitation for himself and a heritage for his children". Coconut is one of the most useful tropical palms, where almost all part of it finds various uses in both domestic and industrial sector. The area under coconut cultivation in India is 1975810 lakh ha in the year 2015-16 with a production of 20439 million nuts annually. Kerala accounts for 32.89 per cent of area under coconut in India with third in production after Tamil Nadu and Karnataka (CDB, 2016).

In Kerala, during the year 2014-15, Kozhikode ranked first in area and production while Kasaragod occupied the first position in productivity. Over the same year Thrissur district accounts for 10.48 per cent of area in Kerala and was occupying sixth position in production among the districts, with an average productivity of 5828 nuts/ha (CDB, 2016).

The present study is confined to Thrissur district. The area under cultivation of coconut during 2014-15 was 4850 ha with a production of 83221 million nuts. The average productivity of coconut in the district was 5828 nuts per ha. (CDB, 2016)

The coconut based food products have demand in both domestic and foreign markets. Coconut oil export from India during 2015-16 was 8549.97 MT, while 5416.30 MT of coconut oil was imported. Desiccated coconut being one among the value added food products preferred by the international markets, was exported to the tune of 4260 MT. Virgin Coconut Oil (VCO) was the least exported coconut product from India with a quantity of 818.33 MT during the year 2015-16 (CDB, 2016).

Coconut palm exerts a profound influence on the rural economy of the many states where it is grown extensively and it provides sustenance to more than 10

million people and also the processing and related activities centered on the crop generate employment opportunities for over two million people in India (Theerkhapathy and Chandrakumarmangalam, 2014). The contribution of the coconut oil to the national edible oil pool is 6 per cent and in addition, the crop contributes Rs.7000 crores annually to the Gross Domestic Product (GDP).

Recently there is a shift in market from coconut towards high value coconut products like coconut milk, virgin coconut oil, spray dried coconut milk powder etc. Though this would exert added pressure on supplies, it should serve to strengthen coconut prices to the benefit of the growers in the long term, which in turn would serve as a great incentive to continue and expand coconut production. The time has come to restructure the export policy of value added coconut products as the demand and supply for the coconut product shows a steady growing tendency (Muralidharan and Ramanathan, 2012).

Even though diversification technologies have been evolved for more than forty products of coconut by different research institutions, only a few are being manufactured on commercial scale. Moideenkutty (2005) had reported that Kerala has not made tangible progress in product diversification and by-product utilization such as oil milling and coir processing, which the main reason coconut oil was being the major product influencing the farm level price of coconut. Vargheese (2007) reported that not even 10 per cent of the coconut farmers in Kerala are processing green coconut into copra instead same is offloaded to the trader's yards for processing. Hence, it is important to make an analysis of the effectiveness of product diversification in coconut and the various aspects of the product markets with regard to the performance of various stakeholders in marketing.

The value chain implies the entire range of activities required to bring a product from the initial input – supply stage, through various phases of production, to its final market destination. As opposed to the traditional way of exclusive focus on

production, the concept of Value Chain Analysis (VCA) stresses the importance of value addition at each stage, thereby treating production as just one of the several value adding components of the chain. The value chain frame work has been used as a powerful analytic tool for strategic planning and also in identifying and understanding the crucial aspects to achieve competitive strengths and core competencies in the market place. The proposed study entitled 'Value Chain Analysis (VCA) of coconut based food products' will use this value chain frame work to identify the constraints and opportunities of the coconut food economy of Kerala. The cost and margin of main players at different levels of value chain will be identified. The constraints will also be identified and assessed in order to improve the performance of the value chain.

The study will also give insight into the strategic policies to be taken up for the direct and indirect benefits of farmers and the scope and relevance of entrepreneurship in coconut based industries.

The various research questions put forth while carrying out the study includes the mode of functioning of coconut based food products industries, cost and return sharing among various chain players, the constraints and opportunities for the chain players and what might be the hindrances in wider adoption of value added food products ventures.

Based on the research questions cited above the following are the specific objectives of the study.

1. To map the value chain of coconut based food products
2. To study the backward and forward linkages in the value chain
3. To estimate the costs and value added at successive stages
4. To identify the opportunities to improve the performance of the value chain.

Scope and limitations of the study

This study provides information on the determinants of marketing margin, benefit share of actors and identifies the opportunities and constraints in the value chain of coconut based food products in the study area. The study could also help in making policy recommendations for the development of sector.

The limitations of the study are that the study is confined to a single district, limiting it spatially and hence, generalization to the entire industry in the state or the country should be made with caution.

REVIEW OF LITERATURE

2. Review of literature

In this part of the study the value chain concept, difference between value chain and supply chain, mapping of value chain, the concept of agro-value chain, value chain analysis of agricultural commodities and specifically, the value chain analysis of coconut are discussed.

2.1 Value chain concept

Porter (1985) first introduced the term value chain analysis in his book 'Competitive Advantage' in 1985. Value chain provides a frame work to strategically and effectively view the different activities of a business organization so as to assess their relative cost and differentiation. The activity based view of business organization categorizes the operations of a firm into two categories *viz*., primary and supporting activities. The primary activities include the physical creation of the product, its sale and transfer to the buyer as well as after sale services. The activities supporting the primary activities like input procurement, labour recruitment, technology development and infrastructure falls under the second category.

The world business council for sustainable development (2011) has given the definition as "A value chain refers to the full life cycle of a product or process, including material sourcing, production, consumption and disposal/recycling processes"

Dunne, (2001) defined supply chain as the physical flow of goods that are needed for the transformation of raw materials to end products. Supply chain management is aimed at creating an efficient chain through better flow scheduling and resource use, upgrading quality control throughout the chain, minimizing the risk associated with food safety and contamination, and reducing the agricultural industry's response to changes in consumer demand for food attributes.

2.2 Supply chain versus value chain

The global supply chain forum (1988) defined supply chain management in a way that blurred the distinction between supply chain and value chain. The definition is given as the integration of main business process from end user through original suppliers that provide products, services and information that added value for customers and other stakeholders, thereby adding the notion that supply chain process must be a value adding process, confusing it with value chain analysis.

Hobbs et al. (2000), differentiated a value chain from a production/supply chain as the chain players in the value chain have a long-term strategic vision, disposed to work together, directed by demand and not by supply and high level of faith in one another that enable greater security in business and ease the development of common goals and objectives results in mutual commitment to regulate product quality.

According to Kaplinsky and Morris (2002) value chain includes all activities related to transforming a product or service from its initial raw material form to final form. The activities ranges from raw material or input procurement, assembly, physical transformation of the product, acquisition and other services required like cooling or transport and final response to the consumer demand.

Webber and Labaste (2010) differentiated the overlapping concepts of value chain and supply chain. The value chain is characterized by vertically linked interdependent process and horizontally linked to other value chains. The vertical integration eventually results in adding value to consumers and horizontal linkages results in production of intermediate goods and services.

Feller et al (2006) defined that supply chain comprised of all procedural and logistic activities involved in transferring a product from supplier's supplier to customer's customer. Supply chains focus upstream on integrating supplier and

producer processes, improving efficiency and reducing waste, while value chains focus downstream, on creating value for the customer. And supply chains predominantly focused on reducing costs and attaining operational supremacy while value chains focus more on innovative ways in product development and marketing.

But the value chain and supply chain concepts are difficult to clearly differentiate from each other and are complimentary to each other and are taken into consideration for business upgrading.

2.3 Global value chain

Gereffy(1994) defined the Global Commodity Chains (GCCs) as "sets of inter-organizational networks clustered around one commodity or product, linking households, enterprises, and states to one another within the world-economy. These networks are situational specific, socially constructed and locally integrated, underscoring the social embeddedness of economic organization".

Later, towards the end of 20th century, along with emergence of concepts like globalization, the limitless market opportunities for world economies made them more interdependent. The value chain perspective of globalization shifts the focus of multinational firms' view on business activities from mere production to all activities involved in the design and marketing of a product. Gereffy *et al.* (2001) have analyzed the concept of the global value chain in detail. Global value chains emphasize the relative value of the activities that are required to bring a product or service from conception, its physical transformation through the different phases of production, delivery to end users, and final disposal after use.

2.4 Value chain governance and upgrading

Gerefy (1994) reported about "producer-driven" chains and "buyer- driven" chains, based on the power or dominance of the chain players on the rest. In the first category of chain, power is held by final product manufacturer which is the feature of

capital-, technology- or skill-intensive industries. In buyer driven chains, retailers or marketers of the end products employ the most power through their capacity to encourage mass consumption through strong brand names.

Gereffy (2011) reported the GVC approach, of holistically viewing the global industries from two contrasting vintage points: top down and bottom up. The core concept for the top-down view is the "governance", and the bottom-up perspective is "upgrading," of global value chains. Value chain governance focuses mainly on lead firms and the organization of global industries and upgrading focuses on the game plans used by nations, regions and other economic stakeholders to perpetuate or upgrade their positions in the global economy.

Gereffy and Lee (2012) were of the opinion that value chain governance explains how corporate power can actively shape the distribution of profits and risk in an industry, and the actors who exercise such power through their activities. They also point out the new trends on global value chain analysis is the rise of buyer driven value chains in which, large retailers are the key drivers in the formation of internationally dispersed production and trade networks. The retail giants like Walmart and Tesco dictate the standards and operations of global supply chains.

2.5 Value chain analysis

UNIDO (2009) has defined value chain analysis as the process by which a chain is broken into its constituent parts so as to better understand its structure and functioning. The value chain analysis includes identification of the chain players at each stage of the chain and understanding their functions and relationships; determining the chain governance to facilitate chain formation and strengthening; and demarcating the value adding activities and assigning costs and added value to each of those activities.

The five basic steps in value chain analysis according to UNIDO (2009) are,

1. Selecting and prioritizing the value chain in terms of subsector, commodity or product

2. Analyzing the selected value chain by mapping of value chain, market analysis, technical capacities and economic performance.

3. Formulating an upgrading strategy for the selected value chain with the identification of constraints and opportunities.

4. Implementation of capacity building value chain upgrading strategy for support institutions and

5. Monitoring and evaluation through impact assessment.

Trienekens (2011) studied the frame work for developing country value analysis and found that most of the value chain studies focus on market relations and not on the business environment of the chain players. He has identified three tier frame work for a balanced value chain analysis which is: (i) network structure, of horizontal and (vertical) market channel relationships; (ii) value added, as related to the key competitive aim of any business chain; and (iii) governance, covering organizational arrangements between value chain actors.

Akenbor and Okaye (2011) studied the impact of value chain analysis on the competitive advantage of Nigerian manufacturing industry. They have reported about two types of value chain; a company's internal value chain and an industry value chain. The internal value chain consists of all activities which are both physical and technological in nature which adds value to the product. Here, value chain analysis focuses on demarcating the strategic activities from the rest of the value chain activities and reduce the cost of such activities in order to get a competitive advantage than their peer competitors. The industry value chain is characterized by the series of activities commencing from raw material manufacturers to the dissemination of the consumer goods to the end user. The analysis of this type of value chain can be

achieved when a company identify its relative position in the industry value chain and try to improve their relative industry strength by improving its internal value chain.

2.5.1 Dimensions of value chain analysis

Schneemann and Vredeveld (2015) had identified about four dimensions of value chain analysis *viz*; economic, social, environmental and institutional. Economic dimensions encompass the potential for market growth, employment generation, value addition and competitive advantage. The sustenance of economic development is achieved only by reducing the possible negative impact on environment. Thus, the environmental dimension includes the pollution and degradation effect of value chain on environment, climate change and resource scarcity. The social dimension addresses inclusiveness of marginalized group, quality working environment, impact on the surrounding community etc. Institutional aspects refer to the 'enabling environment', such as favourable policy and regulatory environment, by public, private and other pertinent stakeholders. It often forms a 'pragmatic' and also key condition for successful value chain intervention.

2.6 Value chain development

According to Donovan *et al.* (2011), the Value Chain Development (VCD) is a new concept which the governments and NGOs had identified as a tool for better economic growth and combating poverty. It is the logical outcome of value chain analysis which focuses mainly on value chain actors rather than chain activity. The concept of VCD is defined based on two aspects, one that focuses on chain actors and the other one, on the business environment that the actors are working. In both cases, the VCD aims at improvement of the linkages among the actors of the chain such as processors, exporters and retailers who interact for the production and marketing of a given product, and their operational environment, in a way to mutually benefit them.

World Bank offers the most clear-cut definition for VCD: "At the heart of VCD is the effort to strengthen mutually beneficial linkages among firms so that they work together to take advantage of market opportunities, that is, to create and build trust among value chain participants (Rist *et al.*, 2010).

The value chain development approach in the agricultural sector of developing countries is done with the intention of alleviating the poverty of poor farmers. Discussing about the ability of value chain approach for a pro-poor growth, Clottey and Becx (2013) opined that the VCD approach of Ghana agriculture sector hindered the farmers from attaining entrepreneurial skills due to some interconnected constraints. They were poor quality factors of production, risk and uncertainties, lack of incentives to invest and mindset of subsistence farmers. They recommended the need for the value chain approach to take into account the above mentioned constraints in order to wipe out poverty from the rural poor farmers.

2.7 Agro value chain analysis

An agricultural value chain can be considered as an economic unit of analysis of a particular commodity (e.g. milk) or a group of commodities (e.g. dairy) that encompasses a meaningful grouping of economic activities that are linked vertically by market relationships. The emphasis is on the relationships between networks of input suppliers, producers, traders, processors and distributors (UNCTAD 2000).

Pandey *et al.* (2010) gave the definition for agro value chain as the value chain encompassing the input supply, production, post-harvest, storage, processing, marketing and distribution, food service and consumption functions all along the farm-to-plate continuum for any given product. The modern agro value chain is composed of three flows, physical product flow, financial flow and information flow. Physical product flows include physical movement of raw materials and end product. Credit, payment schedule and insurance constitute financial flow. The physical and financial flows are integrated through information flow.

2.7.1Classification of agro value chain approaches

According to Raju and Singh (2014) agro value chain is classified into four based on the basis of the driving agent.

1. Corporate driven value chain

The major corporate assumes a predominant role in shaping the market linkages of the small holders in favour of larger firms and plantations and the small holder's participation is mostly excluded in forming these market linkages. The corporate driven model may be

a) Direct buyer model: the pivotal point of this value chain may be a large agro processing firm or a specialized supplier of a commodity. The firm owns a well established storage system, logistics, local processing plants and raw material supply is ensured through contract farming.

b) Retailer driven model: the global retail giants make decision on product standards and quality. The small farmer's participation in this value chain is dependent on their collective strength.

2. Intermediary driven model

The participants of the value chain are heterogeneous public or private sector intermediaries like input suppliers, traders and wholesalers.

3. Producer driven model

Farmers are the centre of the value chain, which is a bottom up value chain. A leader farmer, for instance, could take the entrepreneurial responsibility to organize and collect the produce of neighboring small farmers.

4. Hybrid network model

It is collaborative network model of stakeholders to converge the profit motive of private business firms and societal and environmental conservation goals so that the business firm can grow and mature. The inclusiveness of small farmers through co – ownership made them able to upgrade in value chain.

Devi et al. (2010) viewed the value chain analysis from the perspective of agricultural labour, an input which is often excluded from the ambit of value chain analysis of agricultural commodities. They have analyzed the impact of an institutional initiative in adding value by capacity building through training and institutionalizing the most critical input in farming, viz. farm labourers through the programme of food security army (FSA) aimed at mechanizing the paddy farming. The study found out that though the farm labourer's income have improved through the FSA and recommended to continue the programme as an evidence in institutional involvement in capacity building..

The Philippines agro industries have adopted the value chain approach for the sustainable development in the country especially through local governments and civil society (Brions, 2014). The value chain analysis of major crops and livestock had been performed and the opportunities were identified. The major finding was that opportunities are sustained for export oriented crops. The value chain studies also take note that risks (e.g. price volatility) and entry barriers (lack of market access) do pose challenges towards agri enterprises even in the high-opportunity areas.

Jones *et al* (2010) developed the concept of value chain deepening referred to as adding more value to an existing value chain of a particular industry by addition of more processes which was intended to compensate the gap in the linkages or by facilitating new linkages between chain players. It was to be achieved by reorienting the value chain to new markets, promoting specialization among chain players, and by enhancing cost efficiencies. The Kenyan vegetable value chain was improved by

investing in infrastructure, providing incentives to exporters, promoting certification, market segmentation, sophisticated packaging, and servicing niche markets.

Jones *et al.* (2010) reported that the Mozambican cashew industry value chain was rejuvenated using business replicating model in which the lead firm of the industry gave technical assistance to the smaller and medium processing firms in cashew replanting, better yield and quality control. The government also supported the industry in financial terms. Thus, the entire Mozambican cashew industry value chain improved the volume of export and created employment through manual processing of cashew nuts.

Gorman *et al.* (2010) reported about value capturing to Ghanaian pineapple industry through horizontal integration of small processors. The industries Associates acts as service providers for the small processors in efficient processing and marketing methods. This integrated approach improved the value chain by improved quality control, speedier and cheaper access to inputs, improved market linkages and information sharing.

2.8 Mapping of value chain

Legesse (2014) outlined the methods used in value chain mapping. After clearly identifying the point of entry of a value chain of a particular commodity, mapping of value chain is carried out using input output relations, the physical flow of products along the chain, flow of services, skills and consultants along the chain, employment, destination of sales in terms of wholesalers, number of buyers, concentration of sales among major buyers, and also import and export.

While mapping the value chain of banana in India, Pauline and Ajjan (2014) have found that the south Indian markets were highly complex with many intermediaries. Each stakeholder in a value chain was found to work in isolation. Data integration, financial flow management, supply-demand matching, collaborative

forecasting, information sharing, goods movement, synchronization through efficient transport scheduling were yet to be planned in value chain. This fragmentation in the value chain was reported as the reason for high market transaction cost and less price realization by the farmers.

2.9 Value chain approach in coconut and coconut based food products

Pabayun *et al.* (2009) have studied the value chain analysis of three coconut based food products namely coconut oil, virgin coconut oil and coconut wine in Philippines. The farmers being at the downstream end of the value chain were the least participating in the value chain as they were selling the raw produce. In the coconut oil value chain the farmer's share of the final product value was close to 40 per cent. The distributor and retailer together got 53 per cent, while the other intermediaries had much smaller shares. In VCO value chain, farmers and primary processors were getting 10 per cent and 11per cent of the profit respectively. The coconut wine value chain was found to be different in which the farmer/ processor received 73 per cent of profit share because of the low value addition of the final product and negligible transportation cost.

Kumar and Kapoor (2010) conducted a value chain analysis of coconut in Odisha where the marketing channel was well established and found out that there was a high ratio of vendors to farmers and aggregators to vendors in the channel. The vendors and aggregators were making high profit in the channel. In all channels in the state, the product flow was very smooth and the product reached the end user without much loss. Each player in the chain was found to receive reasonable profit. No value addition to the product was carried out at any of the stages of marketing.

Value chain approach was adopted in coconut fibre products in Kerala under ICAR, NAIP scheme which aimed at poverty abatement, security of livelihood and employment creation, safeguard environmental health and the holistic development of coconut in association with consortium partners and other associates. The value chain

approach began with the selection of the variety which was suitable for coconut fibre and nut with the aim of establishing two bio-industries based on food and fibre. The selected farmers were given trainings for quality coconut production. The value addition was ensured by ranking coconut based on its use potential. The MOU was signed with the consortium partners and other associates to ensure production and supply of coconut seedling and policy intervention at administrative level was also taken into consideration. (Thumpi,2013).

Njugu (2013) studied the competitiveness of coconut wine industry in Kenya, which was operating under inappropriate policy and legal framework causing insignificant processing capacity and limited value addition in toddy value chain. As the coconut wine was safe to drink beverage with no traces of methanol, the Kenyan coconut development authority took the initiative in promoting the coconut wine. This resulted in the standardization and establishment of separate sale outlets for coconut wine transforming the coconut value chain into a profitable one.

Shashikumar and Chandrasekhar (2014) studied the marketing of coconut in Tumkur district and reported that the coconut farmers were selling the produce to the pre and post-harvest contractors and it passed through the street vendors, wholesalers and retailers in the marketing channel before reaching the consumers. Processing industries were having contact with the coconut producers and the marketing channel includes many intermediaries like commission agents, street vendors, wholesalers and retailers.

The study of coconut cultivation and marketing in Pollachi taluk has been conducted by Yamuna and Remya (2016) and they found that increased production in the state has made it difficult to find market for the surplus. Majority of producers sold coconut through middlemen and hence the price fixation was being made by dealers. The respondents felt that they had little scope and power in bargaining for better price fixation.

2.10 Impact of value addition

Naik *et al.* (2015) reported the scope of value addition and downstream processing methods in coconut which includes extraction, concentration and drying. Products like copra, coconut oil and desiccated coconut were having high demand in domestic and export markets. The processed products like coconut oil and coconut milk were found to be gaining importance in the cosmetic industry.

Gajanana *et al.* (2010) reported the success story in the marketing of value added products of underutilized fruits like aonla, tamarind and jack fruit by the small scale processing units of Karnataka, Maharashtra and Gujarat. Even though the market shares of these products were comparatively low, 10.2 per cent in wholesale and 11.38 per cent in retail market; the presence of the products was strongly felt in the market. The net profit from marketing these products ranged from 17 to 23 per cent net profit.

Rao *et al.* (2010) analyzed the impact of innovations on sorghum value chain in Andhra Pradesh and reported that the reason for reduced consumption of sorghum based food was the inconvenience in preparation. This was eliminated through the preparation of ready to eat /cook foods. Based on consumer study and tracking of trade channel, the semi- processed sorghum foods, viz. flakes, pasta, vermicelli and rava were identified as having market potential. It was evident from the study that flakes and rava were priced higher over the existing sorghum products and investment made at the rate of Rs 890/ha improved the returns of farmers by 51 per cent.

The study by Putri *et al.* (2015) recommended value addition of cocoa as the remedy for weak competitiveness of Indonesian Cocoa industry besides the abundant production of cocoa beans. The value addition was low in the country and products which could be derived from cocoa like cocoa powder, cocoa paste, cocoa cake,

cocoa butter and cocoa liquor could further strengthen industry and economy as a whole.

2.11 Price spread and marketing efficiency

A price spread analysis of coconut in central Kerala by Narayanan and Bastine (2004) revealed that majority (86 %) of the farmers sold their produce in the farm itself. The prominent marketing channel identified was producer—copra maker—oil miller—wholesaler—consumer. The concurrent margin concept was used to identify the marketing margin and it was found that producer's share in consumer's rupee was only 60.58 per cent, implying a high price spread.

The department of economics and statistics (2009) has conducted a price spread study of coconut and banana in Trivandrum district of the state of Kerala. The average price on one coconut was higher for large-scale cultivators and minimum price variation was observed for small scale cultivators and also price received was higher when it was directly sold to consumers. As the length of the marketing channel decreases, the price variation was found to be low indicating a lesser price spread. When the market channel has five players, the variation in price per coconut was 1.63 while it was 0.92 for a three member channel.

Krishna and Hanumanthaiah (2010) have analyzed price spread of cotton in different supply chains in the Warangal district of Andhra Pradesh. The survey has been conducted among 90 small and medium farmers, and identified four major marketing channels of cotton. In Supply chain IV, the Cotton Corporation of India (CCI) purchased cotton directly from the producer and hence the farmers received the highest share of consumer's rupee (96 per cent). The lowest share was in supply chain I (88.2 per cent), wherein the village merchant's role was prominent. Higher price and low marketing costs made the majority of farmers to adopt supply chain IV.

Devi and Saikia (2014) in their study entitled 'Price spread and market margin of fish in Ujanbazar fish market of Guwahati, Assam' identified three types of players in the chain *viz*: dealers, wholesalers and different type of retailers ranging from large retailers selling 30-50 kg fish to small retailers and fish hawkers who sell fish at the door step of consumers. The consumers have to bear the cost of marketing involved like cost of ice, transportation, and labour charges in the price and the commission of the sellers.

Kumar (2010) while reporting about the milk value chains in Bihar, mentioned about the profit distribution along the chain. It was found that depending upon the milk marketing chain and the level of processing involved, the producer's share in consumer rupee varied from 45 per cent to 76 per cent. When the milk was processed or value added, the proportional gains were not being transferred to the farmers.

Price spread and marketing efficiency of tomato in Rajasthan was studied by Meena and Singh (2014). They have identified two prominent market channels. Channel I with producer's share in consumer rupee of 52.73 per cent was more efficient when compared to channel II, where as it was 47.27 per cent. Total cost of marketing in channel I and channel II were 18.21 per cent and 18.40 per cent respectively. Marketing margins of 34.33 per cent in Channel II and 29.06 in channel I were largely distributed among the intermediaries.

2.12 Constraints and opportunities of value chain actors

Pabayun et *al*. (2009) reported the constraints faced by farmers in the coconut value chain in Philippines. The primary constraints faced by the farmers were the poor technical knowledge about value addition and limited financial incentives. Along with this, poor infrastructural facilities, lack of market information, limited volume for sale and inability to compete with the surplus producers made them unable to explore the new market opportunities.

The Kenyan coconut industry value chain was subjected to study by Agwanda *et al.* (2010) with the objective of finding out the factors hindering the sustainable development of the coconut economy of the country by carrying out a constraint opportunity analysis. They have enlisted the constraints faced by the coconut farmers at production, processing and marketing level. Lack of quality planting materials, inadequate application of high cost input, low technical know-how and insufficient financial resources were the constraints for production. From the processer's point of view the constraints include private ownership or limited access to the oil extraction machineries coupled with high processing cost, poor skills and poor policy guidance. The constraint at marketing level was that there was no distinct market channel and even the transporters acted as chain players.

Fife *et al.* (2011) reported the problems facing the Nigerian coconut economy due to inadequate government policies like poor price support, yellowing disease, shortage of rainfall, rising temperature, land acquisition problems, outdated production technologies along with the import tariff on fertilizers, which made it inaccessible to marginal and small farmers resulting in low yield.

A study by Sinha and Kumar (2010) revealed the improvement in 'tur value chain' in marketing through electronic spot exchange, which ensured transparency in prices, and better price realization for every chain players. The improvements were implemented through credible warehouse management arrangements, reduction in transaction costs and by standardization of spot markets for compulsory delivery of all agri-commodities. With the help of NSPOT the farmers were able to reduce the marketing cost by 50 -70 per cent by reducing the length of traditional value chain and hence the producer's share in the consumer's rupee also increased.

2.13 Producer collaborations in building an efficient value chain

Kumar *et al.* (2010) reported the enhancement of marketing efficiency of fish marketing through institutionalization, in south Indian states like Kerala, Karnataka

and Tamil Nadu. The instititutional mechanism involves self-help groups (SHGs), producer associations, fisherman cooperatives, fisheries development corporations and private institutions in the fish marketing. They have achieved efficiency in marketing through the primary activities of those institutions such as inbound logistics, operations, outbound logistics, marketing and sales promotion and support activities like, technological backstopping, infrastructural facilities, price information and procurement. This made the fishermen to achieve economies of scale, technological innovations, capacity development, linkage among activities, degree of vertical integration, product differentiation, market access, credit access etc.

Raju and Singh (2014) stressed the importance of collaboration across actors in agro-value chains as vital for the survival of small firms for overcoming their small size and fragmented production. They claim that the important resource farmers can share through collectives is knowledge.

2.14 Competitiveness of coconut industries

Chadha (2007) claimed that while global export for the last 15 years has decreased, that of coconut oil, and desiccated coconut have shown a marginal increase. The tariff imposed by European Union on products like coconut oil, lauric acid and activated carbon ranged from 2.5 per cent for coconut oil to 12.9 per cent for RBD CNO which adversely affected the export competitiveness of coconut products. Similarly, the value added tax on desiccated coconut and coconut oil ranges from 10 per cent to 21 per cent in Australia, Slovakia and Portugal respectively.

Pabayun *et al.* (2007) presented a paper on value addition and constraints in coconut value chain. This paper investigated on the possibility of an attempt to integrate small farmers and corporate sector and establish a link between small farmers and global market through effective value chain system. Besides, it has described the role of various players in the value chain and has discussed how the

government, keeping the interests of the farmers in view, can facilitate greater participation of the corporate sector through appropriate policy framework.

METHODOLOGY

3. Methodology

This chapter describes the methodology used in the study, including location, description of the coconut based food products, method of sampling, method of data collection and data analysis.

3.1 Location

Figure 1: Map of Kerala

Figure2: Map of Thrissur

Thrissur district in Kerala (India) is purposively selected for the study as it is one of the districts where relatively more number of coconut based food industries are functioning (CDB, 2014).

Period of study

The primary data was collected for the period from April 2016 to July 2016.

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3.2 Descriptions of the food products

The coconut based food products selected for the study includes coconut oil, virgin coconut oil (VCO), desiccated coconut and coconut chips.

3.2.1 Coconut oil

Coconut oil is an edible oil and it finds wider use in food and non food applications. It is extracted from the kernel or meat of matured coconuts, through power driven rotary mills, expellers and hydraulic presses on commercial scale. It contains 90 per cent saturated fats. Traditional coconut oil is the crude coconut oil, obtained right from the expeller which is unrefined, unfiltered and free of additives. But the standard end product of commercial extraction of copra is refined, bleached and deodorized (RBD) oil (Hebbar, 2010).

The incidence of Coronary Heart Diseases (CHD) in Kerala due to the consumption of coconut oil was proven to be baseless by Kumar (1997) in his study and he pointed out that consumption of coconut and coconut oil in no way linked to CHD in Kerala. Carandang (2008) highlighted the health benefit of coconut oil as it increases the good cholesterol which is the High Density Lipoprotein (HDL) and which eventually leads to decreased incidences of coronary heart disease.

3.2.2 Virgin coconut oil (VCO)

It can be directly extracted from fresh coconut kernel, coconut milk or from coconut milk residue and the oil obtained is pure, raw and pristine, hence the name 'virgin'. The oil extraction methods are hot processing method, natural fermentation method, centrifugation process and extraction from dried grating method (Enig, 1995). The health benefit of VCO has been so evident that people are showing an increased interest towards it. Yeap et al. (2014) has experimentally proven the antistress and antioxidant property of VCO.

3.2.3 Desiccated coconut

Desiccated coconut is the white kernel of fresh mature coconut, shredded and dried down to about 2.5 per cent moisture content under strict hygienic conditions. The main application of desiccated coconut is in confectionary industry. Major importing countries include the USA, Canada, Europe, South Africa, and the major exporting countries are Philippines, Sri Lanka and Malaysia (Grimwood, 1975).

3.2.4. Coconut chips

It is prepared by dehydrating the intermediate coconut kernel, obtained by partial osmotic dehydration. It is crispy and packed in aluminum pouches with a shelf life of six months. This ready to eat food can be prepared in a variety of flavours.

Table 1: The list of the respondents

Sl No.	Name of the respondent	Number
1.	Farmers	20
2.	Manufacturers	7
3.	Wholesalers/retailers/exporters	28
4.	Consumers	20

3.3 Method of sampling and sample size

From the directory of manufacturers published by CDB a complete list of agribusiness units was prepared. A list of ten percent of coconut product manufacturers was purposively selected after consultation with CDB officials. From the data collected from these units, around 10 per cent of each functionary in the chain was purposively selected for further study limiting the overall number of respondents to 75.

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3.4 Method of data collection

Survey method was adopted for the primary data collection. Expert interview were carried out with officials of CDB. Different actors involved and the governance structure in the value chain mapping was done by conducting stakeholder group discussions at the respective processing units. This provides the basic framework to understand the institutional relationship between different actors in the chain. For the survey based on the study framework, separate questionnaires were prepared and used for all the channel players.

Interview was held with the following chain elements

3.5.1 Interview of key chain players involved in the coconut based food products marketing.

3.5.2 Focus group discussion was held in order to identify the value chain performance, constraints and opportunities, efficiency of the chain, profitability, prices etc.

Focus groups are considered to be an effective tool when seeking in-depth understanding of the dynamics involved in a complex phenomenon such as consumer behaviour (Chambers et al. 2007; Krueger & Casey 2009). In this approach, purposefully selected people are assembled to discuss an issue under investigation and the researcher acts as a moderator to guide the discussion (Creswell 2009).

3.5.3 Expert discussions: An in-depth interview is a purposeful discussion between a researcher and a respondent that provides direct access to deep, reliable and valid information related to research objectives (Creswell 2009; Saunders et al. 2009). Expert discussion with officials of CDB, department of agriculture, department of industries was held for getting additional conclusive information about the variable under study.

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3.5 Data analysis

The data were analyzed using statistical tools like descriptive statistics and value chain analysis. Price spread and marketing efficiency was worked out using the method suggested by Acharya and Agarwal (1987).

3.5.1 Percentages

The descriptive statistics like percentages and averages were used.

3.5.2 Value chain analysis

As products move along the successive phases of marketing or through various chain players, there takes place a value addition, transaction of money and information flow among the chain players. The following steps were adopted in carrying out the value chain analysis.

Step 1: Mapping of the value chain: to understand the characteristics of the chain actors and the relationships among them, the flow of products through the chain and of the destination and volumes of sales. This information can be obtained by conducting surveys and interviews.

Step 2: Identifying the distribution of actors' benefits in the chain: this is achieved by analyzing the margins and profits within the chain and therefore determines who benefits from participating in the chain and who would need support to improve performance and gains.

Step 3: Upgrading the value chain: By assessing profitability within the chain and identifying chain constraints, upgrading solutions could be defined.

Step 4: Value chain governance: the governance represents the power relationship that exists among the chain players. The governance helps to identify the chain players who require support and to correct the distributional distortions. Thus,

governance constituted a key factor in defining how the upgrading objectives could be achieved.

3.6 Analysis of value chain performance

Estimates of the marketing margins are the best tools to analyze performance of market. Marketing margin was calculated by taking the difference between producers and retail prices. The producers' share is the commonly employed ratio, calculated mathematically as the ratio of producers' price to consumers' price

3.6.1 Price spread:

Farm to retail price spread was worked out by finding the difference between the price paid by consumer and the price received by the producer for an equivalent quantity of farm produce.

3.6.2 Marketing efficiency:

Marketing efficiency is related to the cost required to move goods from the producer to the consumer and the quantity of services provided or desired by the consumer. Marketing system is considered as efficient if the cost compared with the services involved is low and vice versa. An improvement which reduces the cost of a particular function without reducing consumers' satisfaction is an indicator of increased marketing efficiency (Chahal and Gill, 1991).

The modified marketing efficiency (MME)

$$MME = \frac{RP}{MC+M} - 1$$

Where, MME = Modified measure of marketing efficiency

MC = Marketing cost

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MM = Marketing margin

RP = Price paid by consumer

3.7 Garret's ranking technique

Garret's ranking technique was used to rank the constraints faced by the respondents. The constraints were identified by pilot survey and review of literature.

$$\text{Percent position} = \frac{100 \times (R_{ij} - 0.5)}{N_j}$$

Where R_{ij} = ranking given to the i^{th} constraint by j^{th} individual

N_j = no of constraints ranked by j^{th} individual

The percent positions were then scored and the mean values of each of the constraint were arranged in the descending order. The constraint with the highest mean value would be the most important.

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RESULTS AND DISCUSSION

4. Results and discussion

The results and discussion part of the study is described under the following titles:

4.1 Demographic and socio-economic characteristics of the respondents

4.2 Mapping of the value chain

4.3 Marketing channel and performance analysis

4.4 Price spread analysis

4.5 Constraints faced by different chain players

4.6 Opportunities for chain players

4.7 SWOC analysis

4.1 Demographic and socio-economic characteristics of the respondents

The demographic and socio-economic characteristics of respondents are presented in Table 2.

Table 2: Demographic and socio economic characteristics of respondents

Variables	Item	Farmers (20)	Manufacturers (7)	Wholesalers/ retailers / exporters (28)	Consumers (20)
Age	<35 years	-	-	3(10.71)	3(15)
	35-45	4(20)	3(42.85)	16(57.14)	6(30)
	45-55	9(45)	3(42.85)	5(17.85)	8(40)
	>55	7(35)	1(14.28)	4(14.28)	3(15)
Education	Below SSLC	6(30)	-	1(3.57)	5(25)
	SSLC	4(20)	-	5(17.86)	6(30)

	Pre-Degree	8(40)	3(42.85)	14(50)	2(10)
	Degree	2(10)	4(57.14)	8(28.57)	7(35)
Sex	Male	19(95)	7(100)	28(100)	17(85)
	Female	1(5)	-	-	3(15)
Annual income (Rupees)	25000-50000	6(30)	-	4(14.28)	5(25)
	50000-75000	8(40)	-	6(21.43)	8(40)
	75000-100000	6(30)	-	11(39.29)	2(10)
	100000-250000	-	6(85.71)	8(28.57)	5(25)
	>250000	-	1(14.28)	-	-

Note: Figures in parentheses indicate per cent to the total

The demographic and socio-economic features of the respondents (Table 2) were collected as part of the study. The total number of respondents was 75. The sample location mainly included Kodungalloor, Irinjalakkuda, Engandiyoor, Thalikulam, Karalm, Aaloor, Chalakkudi, Mala and Perinjanam areas of Thrissur district.

4.1.1 Farmers

It could be observed from the above table that only 20 per cent of the farmers interviewed were primarily dependent on agriculture for their livelihood. The others had different occupations like business (40 per cent), private jobs (20 per cent) and government jobs (10 per cent). The farmers in the age group of 35-55 years (60 per cent) depend on private jobs and business for their daily bread. 50 per cent of the farmers had pre-degree or degree as their educational qualification, while the remaining had SSLC or high school level of education. The range of the annual income varied among the farmers and 70 per cent of them were in the category of Rs. 50,000 to 100,000.

The years of experience in farming were much varied as there were farmers with experience of 15- 24 years as well as with long time experience of 55-64 years. Majority (70per cent) of the farmers were in the category of marginal farmers with an average area of 0.2-0.8 ha under cultivation. Organic method of cultivation was adopted by 65 per cent of the farmers and the rest was following integrated method using both chemical and organic inputs.

Table 3: Characteristics of farmers (N = 20)

Particulars	**Category**	**Frequency**
Occupation	Agriculture	4 (20)
	Govt. job	2 (10)
	Private job	5 (25)
	Business	8 (40)
	Others	1 (5)
Years of experience in farming	15-24 years	10 (50)
	25-34 years	2 (10)
	35-44 years	2 (10)
	45-54 years	3 (15)
	55-64 years	3 (15)
Area under coconut cultivation	Small (<0.2 ha)	5 (25)
	Marginal (0.2-0.8 ha)	14 (70)
	Large (> 0.8 ha)	1 (5)
Method of cultivation	Organic	13 (65)
	Organic + chemical	7 (35)

Note: Figures in parentheses indicate per cent to the total number of farmers

4.1.2 Processors/ manufacturers

The processors were identified as the focal respondents for four of the products selected for the study namely coconut oil, VCO, desiccated coconut and coconut chips.

4.1.2 a) Coconut oil manufacturers

The manufacturers identified for the survey were Karalam cooperative bank, Arikkat oil industries, and ESSEN trading company. Karalam cooperative bank ventured into coconut oil processing and marketed the oil under the brand name 'Neethi'. The Arikkat oil industries undertake coconut oil processing besides other food processing based business. They were marketing coconut oil under the brand name of 'Vismaya'. Essen trading company located at Palissery, Thrissur is a partnership firm evidenced by the deed of partnership. The firm is going to venture into the export business.

4.1.2 b) Virgin Coconut Oil

The main respondent identified as VCO processor was Keratech, Engandiyoor. It is a consortium of four independent VCO manufacturing units assisted by CDB and was formed with the objective of marketing VCO under the common brand name of 'Virgin Plus'. The firm is associated with manufacturing other value added products from coconut like natural hair cream, virgin plus capsule and mouth freshener.

4.1.2 c) Desiccated coconut

Amrutha coconut products, Kodungalloor has entered value added coconut based food products industry in the year 2002-03. Their main product was desiccated coconut which was marketed in the brand name of 'Rose'. They were successfully marketing the desiccated coconut and also engaged in export of the products.

4.1.3 d) Coconut chips

The Kodungalloor coconut producers' company was the seventh company formed under CDB by including the members of Coconut Producers' Societies and Coconut Producers' Federation forum of four blocks namely, Mathilakam, Thalikulam, Chavakkadu, Mala, and Kodungalloor Municipality. The main objective of the company was to build a prosperous and sustainable coconut sector by forming a farmer owned Producer Company that enable the farmers to enhance productivity through efficient, cost effective and sustainable use of resources. Further, to carry on the business of production, manufacture, marketing, import, export, development and for dealing with coconut based products from members of the company.

4.1.3 Wholesalers/ retailers/ exporters

The traders of coconut products were positioned in and around the location of the manufacturers. The age-wise distribution of the traders showed that majority (57 per cent) was under the age group of 35-45 years, while the respondents with age below 35 years were the minority (10.71 per cent). The traders were well educated and this could be observed from the fact that half of them (50 per cent) were graduates and only few (3.57 per cent) of them had educational qualification below SSLC. About 17.86 per cent had SSLC and 28.57 per cent had pre-degree as their educational qualification. The annual income distribution was much varied among the respondents. Majority of them had (60.72 per cent) income in the range of Rs. 50000-100000 and only 28.57 per cent of them had higher annual income of above Rs.100000.

4.1.4 Consumers

Consumers vary in their purchasing power and taste and are becoming more concerned about their food intake as they prefer to have healthy and quality food stuffs from the diversified products and choice of brands they have. Nondzor *et al.*

(2015) also reported that the consumers learn about the products and services they were exposed to and sometimes they developed formed perceptions about the products and their consumer choices were influenced by these knowledge and perception.

All the consumers in the study area were the daily consumers of coconut based food products, especially coconut oil as it is the most popular choice of cooking oil among the Keralites. The demographic and socio-economic characteristics like age, educational level and annual income have influence on decision making of consumers. The younger group was interested to purchase novel coconut based food products. The educational qualification of consumers was also diversified. 45 per cent of the respondents were graduates and 35 per cent of them had pre–matriculation and pre degree as their educational qualification. The income range of consumers also varied as majority (40 per cent) were under the category of Rs.50000 -75000, and only 25 per cent of them was in the range of Rs.100000-25000.

4.2 Value chain mapping

According to McCormick and Schmitz (2002), "value chain mapping is a tool in value chain analysis which enables us to visualize the flow of the product from conception to end consumer through various actors". It also helps to identify the different chain players involved in the coconut based food products value chain, their linkages and functional roles in the value chain.

4.2.1 Value chain actors in coconut based food products

The actors could be categorized into those who are directly involved in value addition and marketing of coconut food products and those who facilitate the coconut value chain activities through information, technology, credit support and also through input supply. Those who were directly involved in the value chain could be

called as primary actors and those who facilitate the value chain activities were called as supporting actors.

4.2.1.1 Primary actors

The major players in the coconut food products value chain of Thrissur district of Kerala are as follows. A diversified channel of product flow was observed in the district. The main players in the value chain were (1) farmer/ farmer cooperative, (2) village traders, (3) commission agents, (4) copra trader, (5) processer/ manufacturer, (6) wholesaler, (7) retailer, (8) exporter, and (9) consumers.

4.2.1.1 (a) Farmer/ farmer cooperative

The farmers involved in the cultivation of coconut and who were also the members of farmer cooperatives were the least involved members in the coconut food products value chain. The coconut farmers were directly selling raw coconut to the processer or through intermediaries like village traders or commission agents. None of the farmers were involved in any value addition activities of coconut before it reaches the processor.

4.2.1.1 (b) Village trader

Village trader was the intermediary between the processor and farmer. They may or may not involve in value addition activity like converting the raw coconut into copra. They were mostly residing in places near to the farmer's residence or confined within the Thrissur district. Village traders are the marketing agents involved in assembling the raw nut from the homestead farms to the processors.

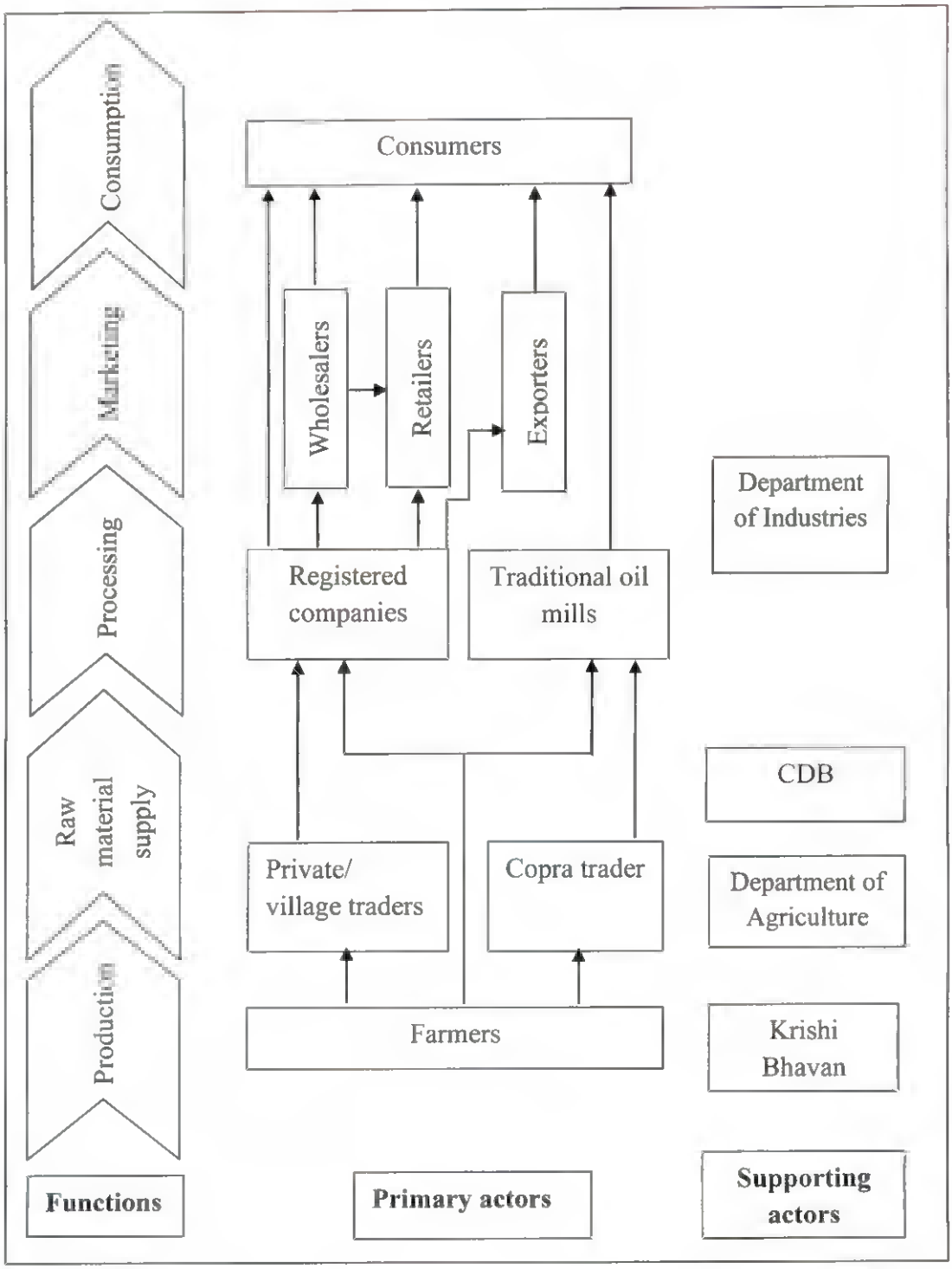

Figure 3: Value chain of coconut based food products in Thrissur

4.2.1.1 (c) Commission agents

Commission agents were agent middlemen and they act as the connecting link between farmers and the manufacturers. They were residing outside Thrissur district, mostly in Malappuram district. The processors were depending mainly on them for supply of raw materials as they ensured bulk availability.

4.2.1.1 (d) Copra trader

Copra traders are involved in the coconut food products value chain as a value adding agent as they transform the raw coconut into copra.

4.2.1.1 (e) Processor/ Manufacturer

They are the traditional oil mills or registered companies and were the leading actors in the coconut food product value chain, who were engaged in the value addition of coconut.

4.2.1.1 (f) Wholesaler

Wholesalers were mainly involved in buying large quantity of value added products from processors than any other actors and they supplied the products to exporters, retailers and consumers. They have to store the product for a maximum of one week. They were having better transportation and other infrastructural facilities as compared to any of the other marketing intermediaries.

4.2.1.1 (g) Retailer

They were involved in the marketing of coconut value added products and probably the last link between consumers and the manufacturers.

4.2.1.1 (h) Exporter

They were involved in the bulk purchase and transfer of coconut food products from India to countries like U.K., U.S.A., Malaysia, UAE, Qatar, Bahrain, New Zealand, Singapore etc.

4.2.1.2 Supporting actors

Coconut Development Board (CDB), Krishi Bhavan and Department of Agriculture were the main supporting actors in the value chain of coconut food products in the study area.

Coconut Development Board (CDB) is a statutory body established under the Ministry of Agriculture, Government of India for the integrated development of coconut cultivation and coconut based industries in the country. It focuses on increasing the productivity of coconut and diversification of coconut products. The board has taken leadership in forming farmer cooperatives in three tiers as Coconut Producers' Society, Coconut Producers' Federation and Coconut Producers' Company.

4.2.2 The value chain map of coconut based food products

Pabayun *et al.* (2009) conducted value chain mapping of three coconut products namely coconut oil, Virgin Coconut Oil and coconut wine in Philippines. They identified the value chain of the products based on (1) the market participants that perform various roles in marketing to ensure that products reach the end-users in the right form, time and place; (2) the price of the products at the different stages of value addition (3) the distribution of the final product value or the consumer price among the different market participants including the coconut farmer.

Woldesenbet (2013) studied the value chain of vegetable in Ethiopia and identified the different actors involved in the value chain. The value chain map

highlighted the involvement of diverse actors who participated directly or indirectly in the value chain and categorized the actors into primary actors and supporting actors in the vegetable value chain.

4.2.3. Value chain map of coconut oil

The value chain map of coconut oil consists of players like producers, commission agents, copra traders, manufacturers, wholesalers, retailers and consumers. The farmers/ farmer cooperatives directly sold the raw nuts to commission agents, copra traders or the processers. None of the respondents were taking up any value addition activities. The commission agents and village traders were the middle men between the farmers and the processors and they took away a major share of the profit which was unreasonable as the farmers were not getting their due share. The copra trader was also one intermediary and was involved in value addition of the raw nut into copra. The processors were either registered established companies or the traditional small scale oil millers. The coconut oil cake was the main byproduct of processing. The wholesalers, retailers and exporters were the main middlemen involved in the movement of coconut oil to the consumers.

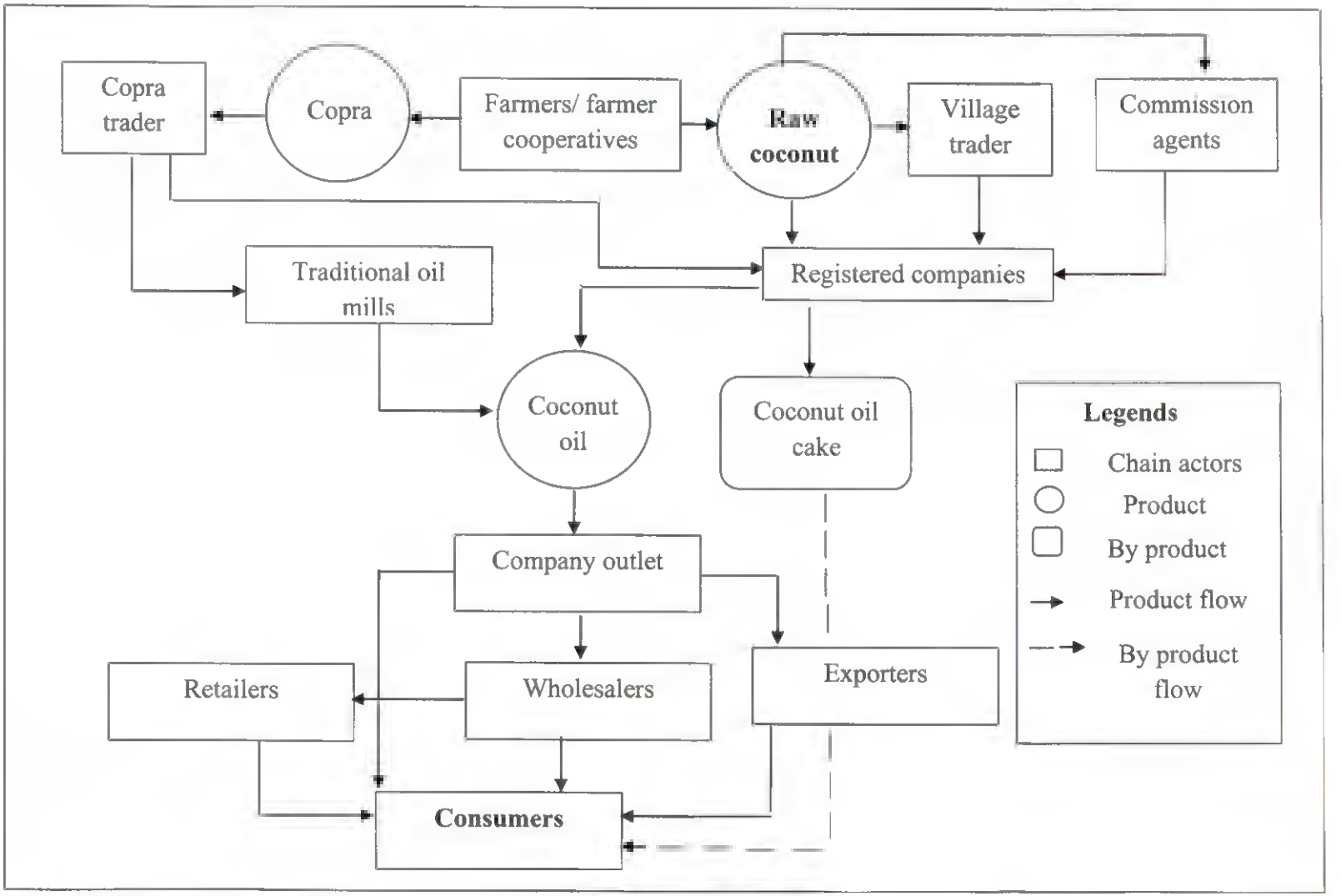

Figure 4: Value chain map of coconut oil

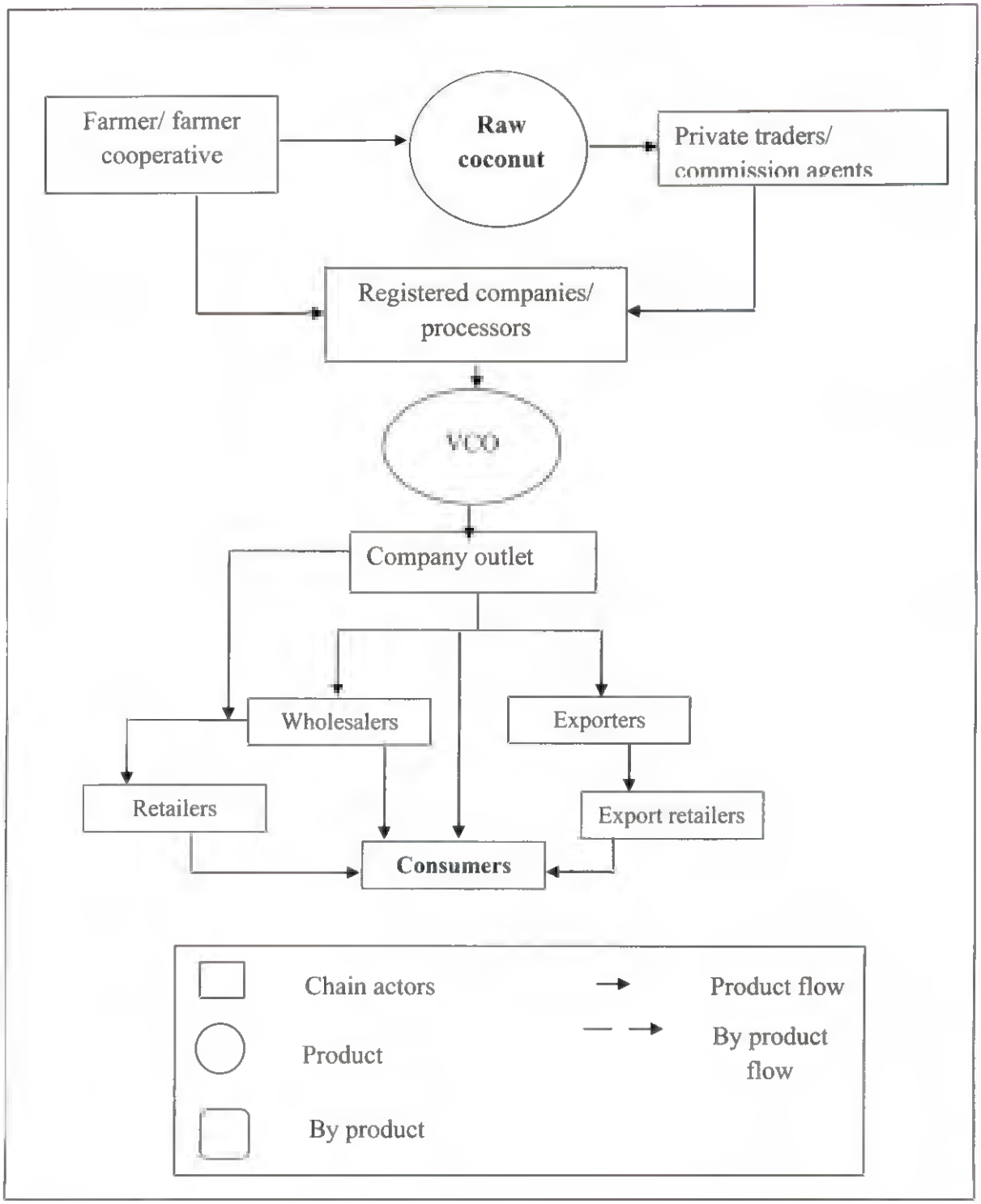

Figure 5: Value chain map of VCO

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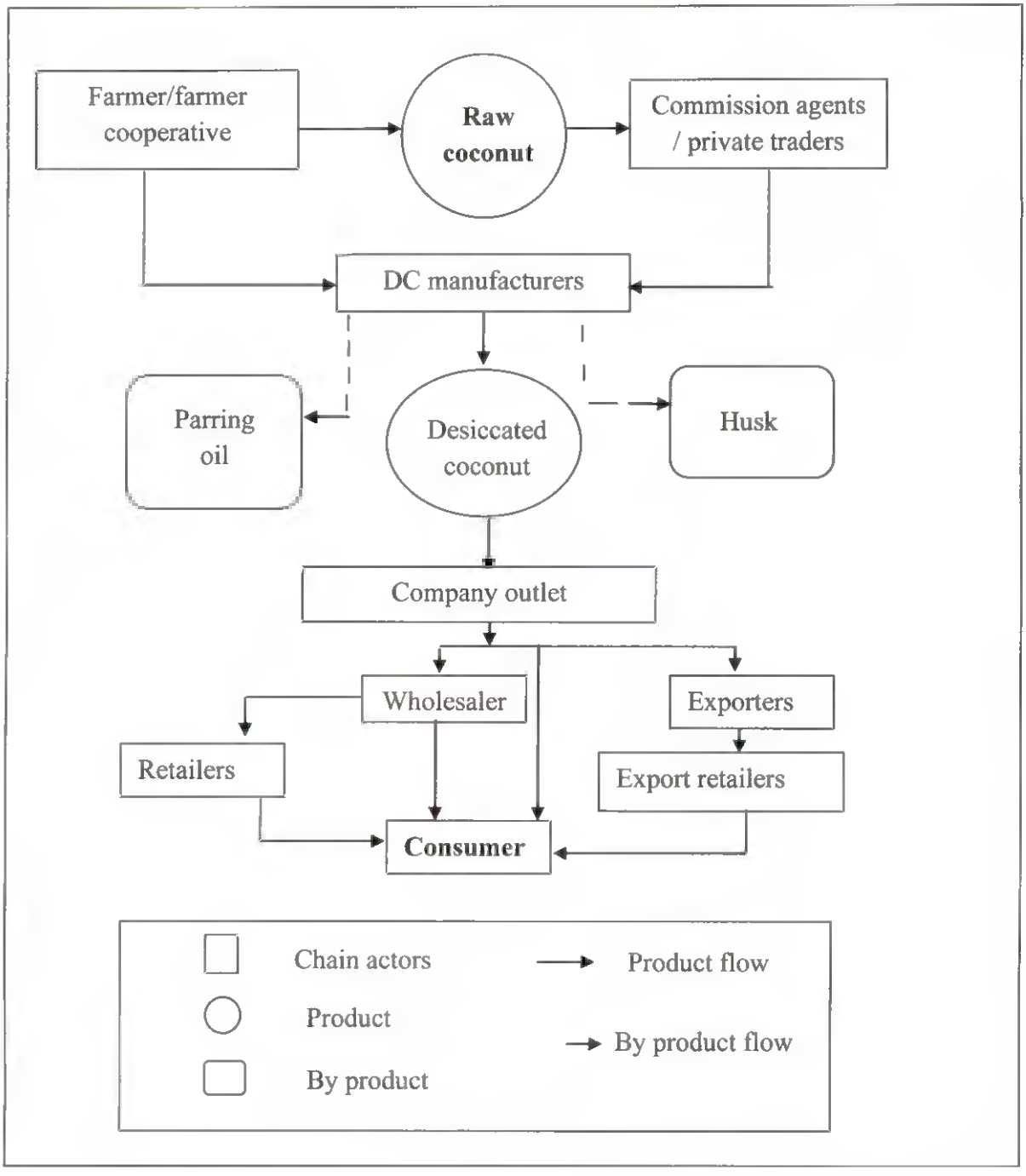

Figure 6: Value chain map of desiccated coconut

4.2.4 The value chain map of VCO

The value chain of VCO had chain players like farmer/ farmer cooperative, commission agents, village traders, manufacturer, wholesalers, exporters, retailers and consumers. The farmers sell the raw nut through commission agents or directly to the processor. The processors were ready to purchase large volume of raw coconut directly from the farmers but the quantity available with the farmers are not sufficient for processing and this was the major hindrance in the value chain upgrading. The processors sold out the product through intermediaries like wholesalers, retailers and exporters and also the consumers can always purchase directly from the company outlet.

4.2.5 The value chain map of desiccated coconut

The value chain map of desiccated coconut comprised of farmers/ farmer cooperative, commission agents, village traders, manufacturer, wholesalers, exporters, retailers and consumers. The product had high demand in the export market because of its instant cooking quality.

4.2.6 The value chain map of coconut chips

The coconut chips is a novel coconut based food product, and the value chain map consists of farmer/farmer cooperatives, processors, retailer and consumers. The value chain lacks large buyers, like wholesaler and the marketing of the product was mainly carried out through retailing.

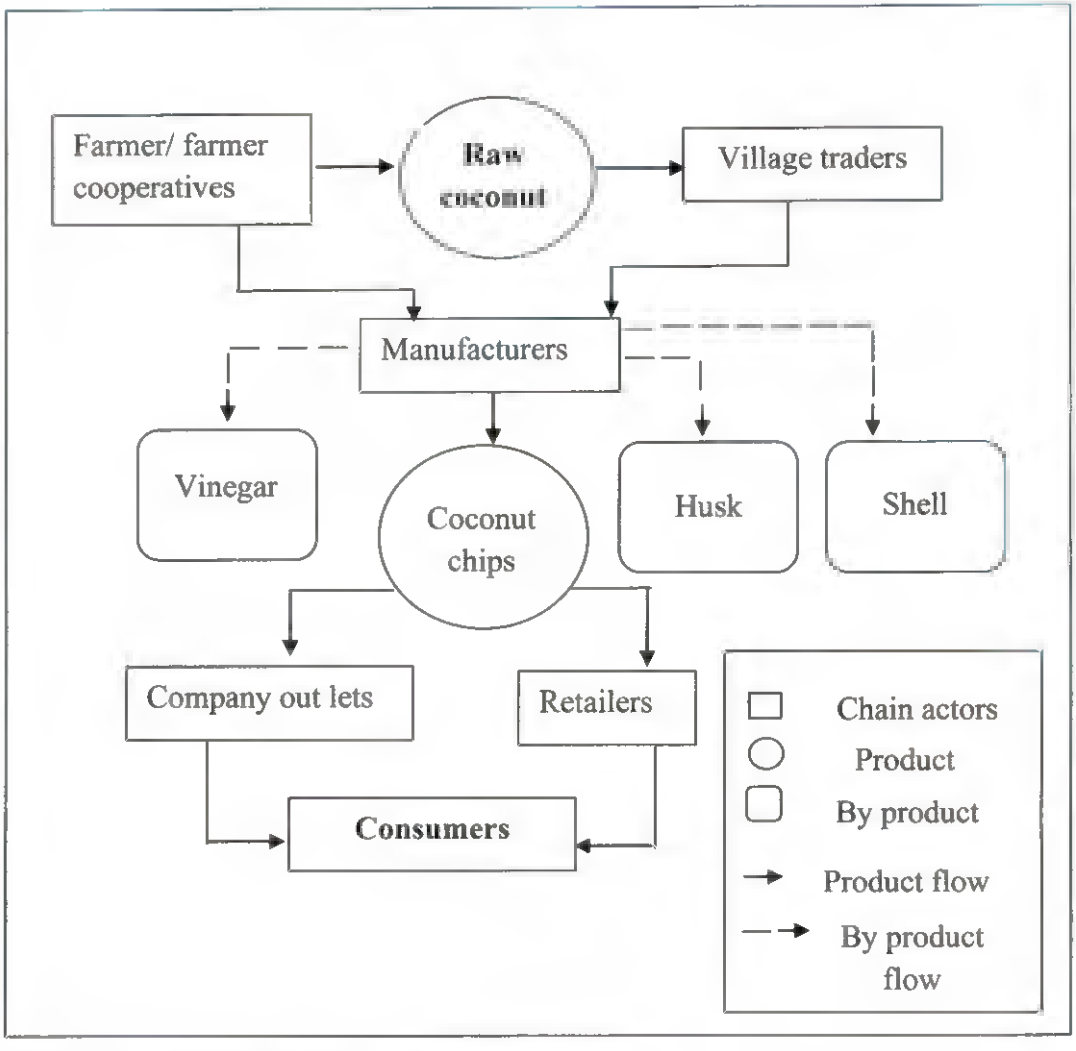

Figure 7: Value chain map of coconut chips

4.3 Marketing channel

Kotler and Armstrong (2003) has defined marketing channel as the business structure of interdependent organizations from the point of origin of the products to the consumer, working with the purpose of moving the products to the final destination of consumption.

The analysis of marketing channels was intended to provide a systematic knowledge of the flow of the goods and services from the origin (producer) to the final destination (consumer).

4.3.1 Marketing channel of coconut oil

Channel 1: Farmer/ farmer cooperative (F) ⟶ Commission agents (C) ⟶ Manufacturer (M) ⟶ Wholesaler (W) ⟶ Retailer (R) ⟶ Consumer(C)

Channel 2: Farmer/ farmer cooperative (F) ⟶ Copra trader (C) ⟶ Manufacturer (M) ⟶ Wholesaler (W) ⟶ Retailer (R) ⟶ Consumer (C)

Channel 3: Farmer/ farmer cooperative (F) ⟶ Manufacturer (M) ⟶ Wholesaler (W) ⟶ Retailer (R) ⟶ Consumer(C)

Channel 4: Farmer/ farmer cooperative (F) ⟶ Copra trader (C) ⟶ Manufacturer (M) ⟶ Exporter (E) ⟶ Consumer (C)

The marketing channel of coconut oil was diversified and complicated. The most prominent and possible marketing channels are listed above. The price spread in first four channels was calculated. Narayana and Babu (2009) have identified four marketing channels for coconut oil in Tamil Nadu. The major driving forces in selecting a channel by the edible oil firms were availability, easiness to market and easiness in collection of money and less expensive.

4.3.2 Marketing channel of VCO

Channel 1: Farmer/ farmer cooperatives (F) ⟶ Commission agent (C) ⟶ Manufacturer (M) ⟶ Wholesaler (W) ⟶ Retailer (R) ⟶ Consumer (C)

Channel 2: Farmer/ farmer cooperative (F) ⟶ Village trader (V) ⟶ Manufacturer (M) ⟶ Exporter (E) ⟶ Consumer (C)

Channel 3: Farmer/ farmer cooperatives (F) ⟶ Manufacturer (M) ⟶ Wholesaler (W) ⟶ Retailer (R) ⟶ Consumer (C)

The most prominent channels of VCO are listed above and the price spread in these channels was also worked out. Pabayun *et al.* (2009) also reported on the marketing channel of VCO in Philippines. They have identified value chain with farmers themselves act either as the processors or directly sold the nuts to the large scale processors. The flavoured VCO was also marketed by the processors at higher prices.

4.3.3 Marketing channel of Desiccated coconut

Channel 1: Farmer /farmer cooperative (F) ⟶ Commission agents (C) ⟶ Manufacturers (M) ⟶ Wholesaler (W) ⟶ Retailer (R) ⟶ Consumer (C)

Channel 2: Farmer/ farmer cooperative (F) ⟶ Manufacturer (M) ⟶ Wholesaler ⟶ Retailer (R) ⟶ Consumer (C)

Channel 3: Farmer/ farmer cooperative (F) ⟶ Commission agents (C) ⟶ Manufacturer (M) ⟶ Exporter (E) ⟶ Consumer (C)

The desiccated coconut is an important value added product which has high global market demand. The marketing channels identified for desiccated coconut in the district were listed above. There were several other possible marketing channels for the product, which include the random combinations of the same value chain players identified.

4.3.4 Marketing channel of Coconut chips

Channel 1: Farmer/ farmer cooperative (F) ⟶ Manufacturer (M)⟶ Retailer ®⟶ Consumer(C)

Channel 2: Farmer / farmer cooperative (F) ⟶Manufacturer (M)⟶ Company out let ⟶Consumer (C)

Channel 3: Farmer / farmer cooperative (F) ⟶Village trader (V) ⟶Manufacturer (M) ⟶ Retailer (R) ⟶Consumer (C)

Marketing channels for coconut chips are not well developed as the major channel is confined to the manufacturer and retailers. Since there are no big buyers for the product, wholesalers were completely absent in the channel. The raw coconut was mainly procured directly from the farmers as the coconut chips manufacturing firm itself was a farmer's cooperative society.

4.4 Performance of value chain

Price spread in marketing is the difference between the price paid by the consumer and the price received by the farmer for an equivalent quantity of the produce.

Value chain involves the transformation of the product from raw material to the consumer good. The value addition taking place during the product

transformation involves cost and margin, which reflects in the final retail price. The cost and the returns associated with the chain players in marketing of coconut based food products were estimated in order to assess the performance of the value chain, as reduced cost and increased returns were good indicators of an efficient chain.

4.4.1 Cost of production of primary, intermediate and finished products

The prices of the products ranging from raw nut to the final consumer goods were worked out to arrive at the cost involved in each stage of value addition.

4.4.1.1 Cost of cultivation

The cost of production of coconut was divided into amortized establishment cost and annual maintenance cost. Amortization method is adopted to deduce the large investment needed for the establishment cost of the coconut garden into small sum of equal payments. On an average the establishment cost of coconut garden worked out to Rs. 2, 97,781 per hectare considering seven years as the establishment period. It was then amortized at 10 per cent to get an annualized establishment cost for a period of 43 years by assuming a yielding phase up to 50 years. The amortized value was worked out to Rs. 30192. The annual maintenance cost was estimated as Rs 70164. To this annual maintenance cost, an interest amount, at the rate of 12 per cent was also added to arrive at the cost of cultivation of coconut.

Table 4: Establishment cost of coconut garden

Sl. No.	Cultivation operations	Year-wise cost						
		I	II	III	IV	V	VI	VII
1.	Ploughing and land preparation (7 hours of tractor ploughing @ Rs.75/hr and 5 men labourers @Rs.545 per hour, twice per year)	6500	6500	6500	6500	6500	6500	6500
2.	Cost of seedling (175*75) Gap filling at 5 %	13125	650	-	-	-	-	-
3.	Cost of digging (175*55)	9625	-	-	-	-	-	-
4.	Cost of organic manure (FYM @ 5 kg per pit upto 4th year, @10 kg per pit from 5th to 7th year) FYM Rs.3300 per load	2887	2887	2887	2887	5775	5775	5775
5.	Labour charges for filling the compost pit Male : 545*2 Female : 4*390	 1090 1560	 - -	 - -	 - -	 - -	 - -	 - -
6.	Labour charges for transplanting Male : 1*545	545	-	-	-	-	-	-

	Female : 2*390	780						
7.	Providing shades to seedlings	5060						
8.	Fertilizer application (cost of fertilizers and charges for application)	2148	4298	4298	19334	19334	19334	19334
9.	Liming charges (lime @ 1 kg per palm, Rs. 10/ kg) Labour charge @ 390 x6	-	-	-	2340	2340	2340	2340
10.	Irrigation charges (once in a week for 4 months, one woman labourer @ 390)	6240	6240	6240	12480	12480	12480	12480
11.	Plant protection , crown cleaning @ Rs. 25 per plant	-	-	-	-	4375	4375	4375
12.	Others	2500	2500	2500	2500	2500	2500	2500
13.	**Total**	**52060**	**23075**	**22425**	**40309**	**53304**	**53304**	**53304**

Source: Discussion with farmers

Table 5: Annual maintenance cost of coconut garden

Sl.No.	Items	Cost (Rs./ha)
1	Weeding and basin formation (twice in a year) Machinery Rs. 900/ hr (5 hours) 5 men labourers (@ Rs.700)	8000
2	Cost of organic manure (cowdung/) (@ Rs.10 kg/ pit (1 load @ Rs.3500/ tonne)	6125
3	Fertilizer Urea : 378 kg * Rs. 8=3024 Rajphos : 560 kg * Rs.6 =3360 MOP : 700 kg * Rs. 16= 7700 Cost of labour 5 labourers @ Rs.700	17584
4	Irrigation charges Weekly for 4 months, 4 women labour @ Rs.380 4x4x380	6080
5.	Plant protection chemicals @ Rs. 25/ palm	4375
6.	Harvesting charges (Rs. 40/ palm) 4 harvests per year 4x175x40	28000
7.	**Total maintenance cost**	**70164**

Source: discussion with farmers.

The cost of cultivation of coconut for medium sized land holding was 36576 per ha according to the report on cost of cultivation of important crops in Kerala published by Government of Kerala for the year of 2010-11. The cost of labour and the input costs have considerably high over the last five years which increased the cost of cultivation of coconut.

Table 6: Cost of production of coconut

Sl No	Items	Cost
1.	Establishment cost (Rs/ha)	297781
2.	Amortized value (Rs/ha)	30192
3.	Annual maintenance cost	70164
4.	Interest on annual maintenance cost (12 % rate)	8419.68
5.	Total cost	108775.68
6.	Average production (60 nuts/ palm) from 175 palm	10500 nuts/year
7.	Cost of production (Rs/nut)	10.36

The cost of production of coconut per nut was found out assuming the average production as 60 nuts per palm per annum. The cost was worked out to Rs.10.36 per nut while the CACP (2016) projected the average cost per nut as 8.93.

4.4.1.2 Cost of production of copra

The intermediary product in coconut oil processing is the copra. The cost of production of copra was worked out to Rs. 55.23 per kg. The assumption made during the calculation was that 7250 nuts were required to produce 1 MT of copra.

The CACP price policy for copra advised a price of Rs. 5100/quintal and the modified C2 cost at Rs.6670/quintal for 2016 season. This MSP of milling copra would give gross returns of 27 per cent to the farmers, which was recommended in response to increase in cost of production and the prevailing high market prices of both copra and coconut oil.

Table 7: Cost of production of 1 MT of copra (7250 nuts)

Sl. No.	Items	Cost (MT)
1.	Cost of raw material (@ Rs. 7/ nut)	50750
2.	Cost of dehusking (50 paisa / nut)	3625
3.	Cost of deshelling (Rs. 270/ 2000 nuts)	978.75
4.	Transportation (@ 250/ load(2000 nuts)	906.25
5.	Loading & unloading 2 mandays @500	1000
6.	Smoking and drying and storing charge(5 mandays @ 350)	1750
7.	Gross processing cost	59110
8.	Less value of byproducts (shells & husk) @Rs.0.68 per kg of shell & Rs.50/100 husks	253.75+3625=3878.75
9.	Net processing cost of 1 MT of copra	55231.25
10.	Cost of production of 1 kg copra	55.23

4.4.1.3 Cost of production of coconut oil

Cost of production of coconut oil was computed considering a conversion rate of raw nut into coconut oil as 30 per cent and copra into coconut oil as 60 per cent. The production cost of coconut oil from raw nut was worked out as Rs.90.72 per kg and Rs. 92.46 per kg from copra. Since there was a shortage of good quality copra, the manufacturers were interested to process raw nut into coconut oil instead of purchasing copra from traders.

Table 8: Cost of production of a metric tone of coconut oil

Sl No.	Items	Cost
1.	Cost of procurement a) Raw nut (30 per cent conversion rate)= 11690 nuts @ 7.4 b) Copra (60 per cent conversion rate) 1670 kg @ Rs. 56/ kg	 86506 93520
2.	Packing (@ Rs 0.66/ piece)	660
3.	Loading and unloading @7 man days @ 500	3500
4.	Processing of raw coconut into copra Deshelling and dehusking 2 man days @ 390	 7423.15 780
5.	Processing of copra into oil (milling charges @ Rs. 3/ kg)	3000
6.	Transportation (@ 250/ load @ 2000 nuts / load)	1500
7.	Labour @ 2 mandays @ 390	780
8.	Gross total : a) from raw coconut : b) from copra	104149.2 99460
9.	Returns from by product(350 kg oil cake) @ Rs. 20/ kg Husk and coconut shell	7000 5845+584.5
10.	Net cost of production a) From raw coconut b) From copra	 90719.65 92460
11.	Net cost of production (per kg of oil) a) From raw coconut b)From copra	 90.72 92.46

Table 9: Cost of production of a metric tone of VCO

Sl. No.	Item	Cost
1.	Procurement @ 8.25 for 17000 nuts	140250
2.	Transport (300/load)	300
3.	Loading and unloading 2 mandays @ Rs. 500	1000
	Deshelling and dehusking	1120
4.	Processing 20 mandays @ Rs. 300	6000
5.	Cost of packing : packing bottle @ Rs. 20/ piece	20000
6.	Labeling @ Rs. 1/ piece	1000
7.	Labour for packing 5 mandays @ Rs.300/ labour	1500
8.	Electricity charges 1000 kwh @ Rs.5.60Rs/unit	5600
9.	Water charge 1000 litre @ Rs. 25/litre	25000
10.	Amortized annual establishment cost	7611.76
11.	Gross production cost	209381.8
12.	Returns from by products Shell@ Rs.0.68 per kg Husk @ Rs.50/ 100numbers	57.80+ 850= 907.80
13.	Net production cost (per kg of VCO)	208474
14.	Cost of production per kg of VCO	208.47

4.4.1.4 Cost of production of VCO

The cost of production of VCO was worked out as Rs. 208.47 per kg assuming 17 nuts were required to produce one kg of the produce. The returns from the byproducts of coconut were also worked out. The coconut shell and husk are sold out and they together contribute a little share to the returns. The manufacturers opined that the high power charge was one of the reasons for increased cost of production.

4.4.1.5 Cost of production of desiccated coconut

The cost of production of desiccated coconut was worked out as Rs. 105.63 per kg. The byproduct of the manufacturing process was parring oil, a low grade oil produced from the testa of coconut and it fetches a market price of Rs. 35 per kg.

Table 10: cost of production of DC (1 MT)

Sl No.	**Item**	**Cost**
1.	Cost of procurement(12-13 per cent conversion rate) (10000 nuts) @ Rs. 8.25/ nut	82500
2.	Transport (Rs. 300/ load)	1500
3.	Processing 2 mandays @ Rs.350/manday	700
4.	Electricity charge 1000 kwh@ Rs.5.60 per unit	5600
5.	Water 100 litre @ Rs. 25/litre	2500
6.	Cost of packing and labeling @ Rs. 10 per piece	10000
7.	Labour charges Men 8 numbers @ 350/manday Women 5 numbers @ 300/ manday	 2800 1500
8.	Amortized annual establishment cost	4019.77
9.	Gross cost of production	111119.8
10.	Returns from parring oil (15 per cent conversion) @ Rs. 35/ kg	150 kg*35= 5250
11.	Returns from coconut shell@ 350 kg* 0.68/ kg	238
12.	Net cost	105631.8
13.	Cost of production (per kg)	105.63

Table 11: Cost of production of coconut chips (MT)

Sl. No.	Items	Cost
1.	Procurement (10000 nuts) @ Rs. 8.50/nut	85000
2.	Dehusking 10 mandays @ 350 per manday	3500
3.	Deshelling 5 mandays @ 300 per manday	1500
4.	Processing 20 mandays/ 300 per manday	6000
5.	Packing &labeling Rs. 2.50 per aluminium foil	25000
6	Cost of other ingredients(sugar/ salt @ 10 kg) Sugar @ Rs.52/kg Salt (@ Rs.12/kg	 520 120
7.	Amortized annual establishment cost	18679.7
9.	Gross total of cost of production	140319.7
10.	Returns from coconut shell@ 0.68 paisa/ kg	350 kg* .68= 238
11.	Returns from husk @ Rs. 50/ 100 nuts	5000
12.	Net production cost of coconut chips	135081.7
13.	Per kg production cost of coconut chips	135.082
14.	Per 100g of chips	13.5

4.4.1.6 Cost of production of coconut chips

The cost of production of coconut chips per 100g of chips comes to Rs.13.5. The major share of the price of this product was attributed by the cost of packing.

4.4.2 Marketing cost of coconut products

The cost of marketing was calculated by considering the cost incurred during the marketing activities like assembling, transport, storage, grading, processing, wholesaling and retailing.

Table 12: Marketing cost of per kg of coconut oil (on the marketing channel)

Sl. No.	Value chain actor	Item	Cost (per kg/ 12 nut)			
			Channel 1	Channel 2	Channel 3	Channel 4
1.	Farmer	Transportation	-	-	0.6	-
2.	Commission agents	Transportation (@Rs. 300/2000 nut)	1.8	-		1.8
3.	Copra trader	Assembling Transportation Processing	- - -	 0.49 2.85		- - -
4.	Manufacturer/ processor	Processing (2.85+3+0.66) Assembling	6.51 4.8	3.66 1.23	6.51	6.51 4.8
5.	Wholesaler	Transportation (Rs. 50/km)	0.12	0.12	0.12	-
6.	Exporter	Processing fee Inspection & supervising fee PCA fee	-	-	-	0.42 3.1 0.20
7.	Retailer	Transportation	0.12	0.12	0.12	-
8.	Total		13.35	8.47	7.35	16.83

4.4.2.1 Marketing cost of coconut oil (per kg)

The marketing cost of coconut oil was worked out for four prominent channels. The marketing cost was found to be higher for the exporting marketing channel with Rs.16.83 per kg, and this channel has unnecessary middlemen resulting in increased cost. The third channel with marketing cost of Rs.7.35 was identified as the best in efficiency as marketing cost was the lowest because the farmers were selling the nuts directly to the manufacturer.

4.4.2.2 Marketing cost of VCO (per kg)

The marketing cost of VCO was worked out for three marketing channels. The channel1 has the highest marketing cost as large numbers of intermediaries were involved. The third channel was the exporting marketing channel but the marketing cost was the lowest compared to the other channels.

Table 13: Marketing cost of VCO (per kg)

Sl. No.	**Value chain actor**	**Item**	**Cost(per kg/)**		
			Channel 1	Channel 2	Channel 3
1.	Farmer	Transportation	-	1.25	-
2.	Commission agents	Transportation	2.99	-	2.99
3.	Manufacturer	Processing Assembling	68.22 21.25	68.22	68.22 21.25
4.	Wholesaler	Transportation	50	50	-
5.	Exporter	Processing fee	-	-	3.88
6.	Retailer	Transportation (@Rs.50/ km)	1	1	-
	Total		143.46	120.47	96.34

4.4.2.3 Marketing cost of desiccated coconut

The marketing cost of desiccated coconut was worked out for three channels (Table 14). Out of the three channels, the exporting channel incurred the highest cost with Rs. 37.32 per kg. The second channel was characterized by the direct selling of the raw nut to the manufacturers and it was the efficient one with least cost of marketing of Rs.24.38 compared to the other channels.

Table 14: Marketing cost of desiccated coconut (per kg)

Sl. No.	Value chain actors	Item	Cost (per kg)		
			Channel 1	Channel 2	Channel 3
1.	Farmer	Transportation	-	0.25	-
2.	Commission agents	Transportation	0.25	-	0.25
3.	Manufacturer	Processing Assembling	23.13 12.5	23.13 -	23.13 12.5
4.	Wholesaler	Transportation	0.5	0.5	-
5.	Retailer	Transportation	0.5	0.5	-
6.	Exporter	Processing fee	-	-	1.44
	Total		36.88	24.38	37.32

4.4.2.4 Marketing cost of coconut chips

The marketing cost of coconut chips was calculated for the most prominent channel (Table15) where farmers were directly selling the raw nut to the manufacturers and the coconut chips was marketed through retailers. The channel was lacking large buyers like wholesalers. The marketing cost came to Rs. 15.75 per 100g of the chips.

Table 15: Marketing cost of coconut chips (per 100 g)

Sl.No.	Value chain actors	Item	Cost
1.	Farmer	Transportation	0.25
2.	Manufacturer	Processing	13.5
3.	Retailer	Transportation	2
	Total		15.75

4.4.3 Price spread of coconut based food products

The price spread studies were significant in marketing studies as they clearly suggest the farm to retail price spread and marketing efficiency of a product. The study conducted by Narayanan and Bastine (2004) worked out the price spread of marketing of coconut in central Kerala. They have found out that the price spread per 100 nut was 39 per cent. This higher price spread was definitely an indication of the involvement of a number of unnecessary middlemen who lure the profit the farmers.

Naik and Nagaraja (2016) studied the marketing efficiency of coconut value chain in east Godavari district of Andhra Pradesh. They have worked out the price spread per 1000 nuts for three marketing channels and found that the price spread was highest in channel 1 which involves the pre harvest contractor as the middleman and the farmers realized the least profit share. The least price spread and marketing cost was observed in third channel with less number of intermediaries.

The price spread analysis of coconut by Department of Economics and Statistics (2009) found that the channel with higher intermediaries (F-C-M-W-R-C) causes a price spread of 1.63 per nut. But in channel 2 price spread was reduced to Rs.1.35 per nut when the commission agent was excluded from the channel.

Table 16: Price spread of different marketing channel of coconut oil (per kg)

Sl. No.	Price spread	Channel 1	Channel 2	Channel 3	Channel 4
1.	Farmer's selling price	84	84	88.8	84
	Production cost	124.32	124.32	124.32	124.32
	Marketing cost	-	-	0.6	
	Net price received by farmer	-40.32	-40.32	-36.12	-40.32
2	Commission agents selling price	99	-	-	-
	Marketing cost	88.28	-	-	-
	Marketing margin	10.72	-	-	-
3.	Copra trader selling price	-	89.6	-	89.6
	Production cost	-	88.37	-	88.37
	Marketing margin	-	1.23	-	1.23
3.	Manufacturer's sales price	115	115	115	115
	Processing charge	6.51	3.66	6.51	3.66
	Assembling	4.8	1.23	88.8	-
	Marketing margin	9.49	20.51	19.69	21.74
4.	Wholesaler purchase price	115	115	115	-
	Selling price	118	118	118	-
	Marketing cost	0.12	0.12	0.12	-
	Marketing margin	2.88	2.88	2.88	-
5.	Retailer purchase price	118	118	118	-
	Selling price	125	125	125	-
	Marketing cost	0.12	0.12	0.12	-
	Marketing margin	6.88	6.88	6.88	-

6.	Exporter purchase price	-		-	115
	Selling price	-	-	-	122
	Marketing cost	-	-	-	3.72
	Marketing margin	-	-	-	3.28
7.	Consumer's purchase price	125	125	125	122
	Total marketing cost	13.35	8.47	7.35	16.83
	Total margin	27.65	32.53	28.85	21.17
	Price spread	41	41	36.2	38
	Producer's share on consumer's rupee (%)	67.2	67.2	71.04	68.85

4.4.3.1 Price spread of coconut oil

From the price spread analysis of coconut oil (Table 16) it was clear that the farmers being the ultimate producer suffer the biggest loss in the value chain. The production cost of coconut was 10.36 Rs/nut. The procurement price for coconut during the survey period 2016 April till June was Rs.7/nut. Hence the farmers in turn suffer a loss of Rs.3.36 per nut, whereas the commission agent earned a profit of Rs 1.5/nut. But when the farmers were able to sell directly to the processor they were able to get a price of 7.4 per nut.

The price spread was the highest in channel 1(F-C-M-W-R-C) and 2 (F-Co-M-W-R-C). The producer's share in consumer's rupee was highest and the price spread was least for the channel 3 (F-M-W-R-C), without involvement of any intermediaries between farmers and the manufacturers, but the gap between cost and return remained the same. Hence for each kg of oil produced farmer suffer a net loss of Rs.36.32 for channel 3 and Rs.40.32 for the rest of the channels and hence the procurement price has to be raised in order to benefit the farmers.

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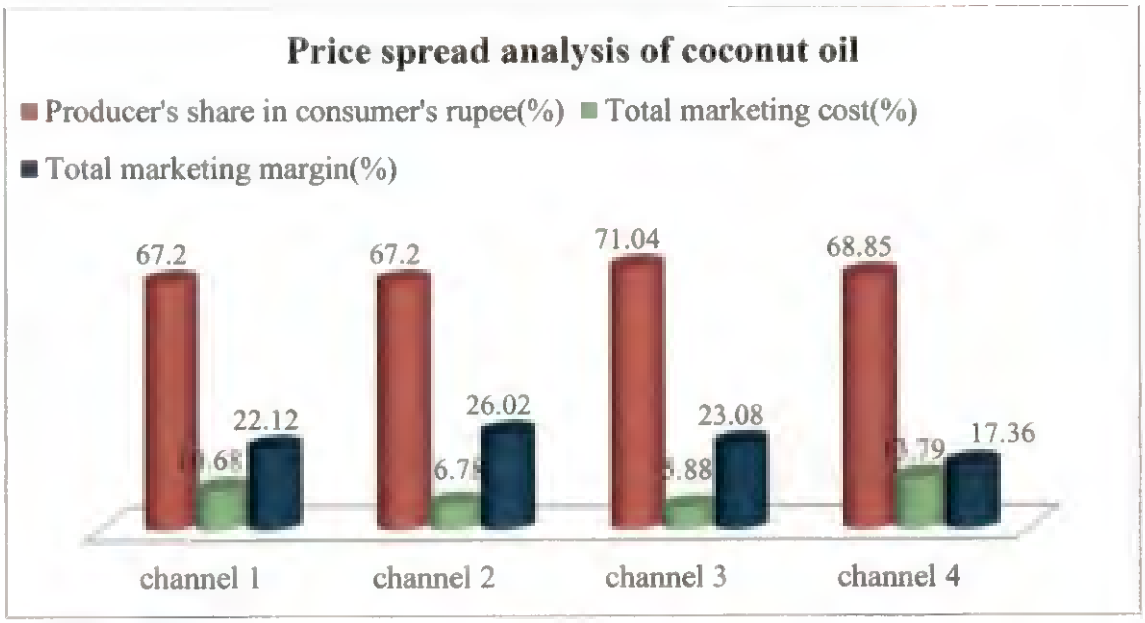

Figure 8: Price spread analysis of coconut oil

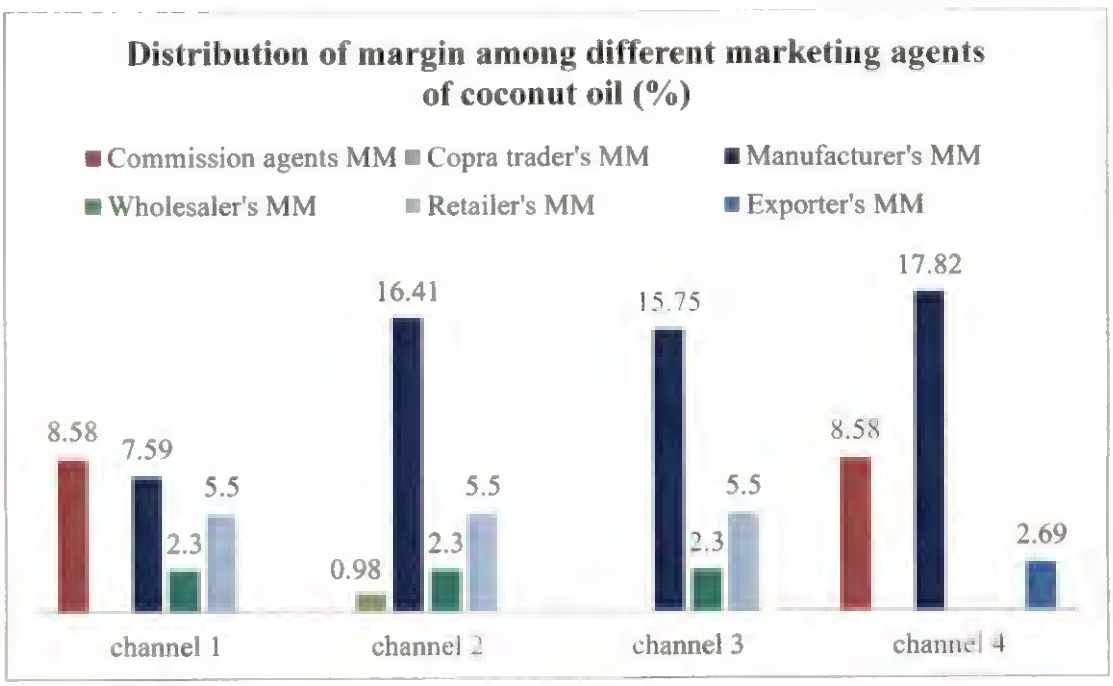

Figure 9: Distribution of margin among different marketing agents of coconut oil

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The price spread analysis showed that the producer's share in consumers' rupee was the maximum in channel three (F-M-W-R-C), with 71.04 per cent. Total marketing cost was the highest in channel 4(F-C-M-E-C), 18.79 per cent mainly which was mainly attributed by the costs associated with export procedures. The total marketing margin was also the highest in channel 4(18.74 per cent) due to the difference in domestic price and export price.

An analysis of the marketing margin realized by the various intermediaries showed that in all the channels the maximum marketing margin was realized by the processors, which was the remuneration for the value addition activities they were undertaking. In Channels 1 and 4, the commission agents were getting considerable share of marketing margin, to an extent of 8.58 per cent.

The graphical representation of price spread of coconut oil marketing (Figure 8) shows that producer's share in consumer's rupee was highest for channel 3. The marketing cost was highest for channel 4 and the marketing margin was highest in channel 2. The distribution of marketing margin (Figure 9) showed that out of the four channels manufacturers incurred the largest share. Commission agents, wholesalers, retailers and exporters were taking a considerable amount of profit though they were not carrying out any value addition activity.

4.4.3.2 Price spread of VCO

Price spread and producer's share in consumer's rupee were calculated for VCO for three different marketing channels (Table 17).The farm to retail price spread for exporting channel was the highest among the marketing channels. The producer's share in consumers' rupee was the lowest in VCO marketing channels compared to other three coconut products in the study. The Producer's share in consumers' rupee was the lowest for channel 2 (F-C-M-E-C) and comparatively higher for channel 3 (F-M-W-R-C). Hence it was clear that the producer's share was disproportionate with the higher consumer price.

Table 17: Price spread analysis of VCO (Rs /kg)

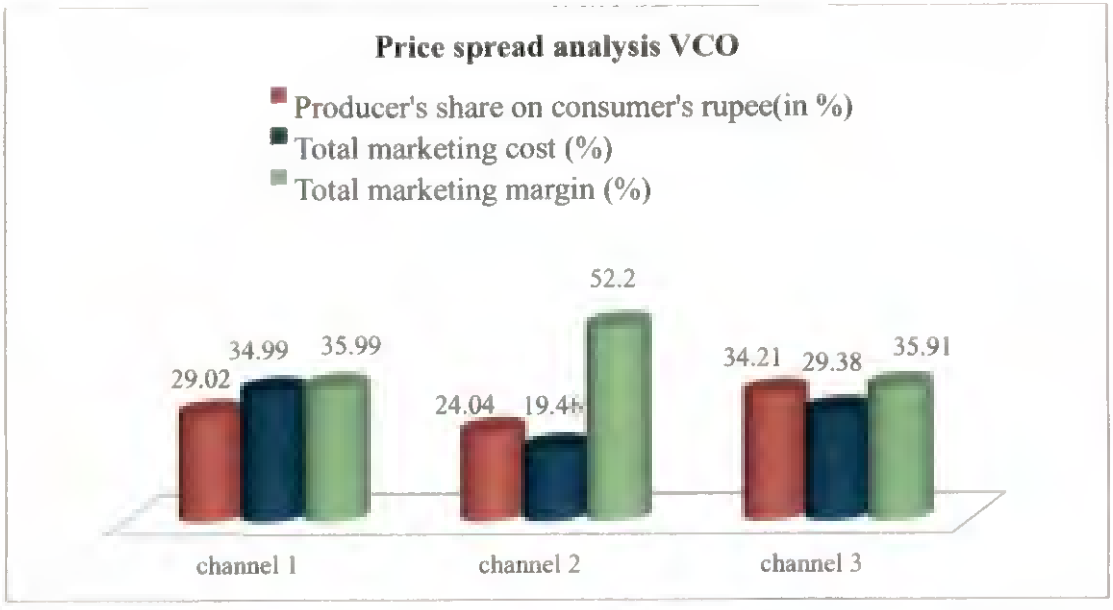
Sl. No.	Price spread	Channel 1	Channel 2	Channel 3
1.	Farmer's selling price	119	119	140.25
	Production cost	176.12	176.12	176.12
	Marketing cost	-	-	1.25
	Net price received by farmer	-57.12	-57.12	-37.12
2.	Commission agents selling price	140.25	140.25	-
	Marketing cost	2.99	2.99	-
	Marketing margin	18.26	18.26	
3.	Manufacturer's sales price	250	250	
	Assembling	21.25	-	-
	Processing	68.22	68.22	68.22
	Marketing margin	41.53	41.53	41.53
4.	Wholesaler sales price	387	-	387
	Marketing cost	50	-	50
	Marketing margin	87	-	87
5.	Exporter Purchasing price	-	250	-
	Marketing cost	-	3.88	-
	Marketing margin	-	241.12	-
6.	Retailer purchase price	387	-	387
	Marketing cost	1	-	1
	Marketing margin	22	-	22
7.	Consumer's purchase price	410	495	410

8.	Total marketing cost	143.46	96.34	120.47
9.	Total margin	147.54	279.66	149.28
10.	Price spread	291	385	269.75
11	Producer's share in consumers' rupee (%)	29.02	24.04	34.21

The price spread analysis showed the producer's share in consumers' rupee was the highest in channel 3 (F-M-W-R-C), 34.21 per cent (figure10). The marketing cost was found to be highest in channel 1(F-C-M-W-R-C), 34.99 percent, (Figure 10). Even though the marketing cost was the lowest in channel 2 (F-V-M-E-C), 19.46 per cent, the marketing margin was highest (52.2 per cent) compared to other channels.

The distribution of marketing margin among intermediaries in various marketing channels showed that Exporter in channel 2 realized the maximum marketing margin (48.71per cent) followed by the Wholesalers in Channel 1 and channel 3), to an extent of 21.22 per cent.

Figure 10: Price spread analysis of VCO



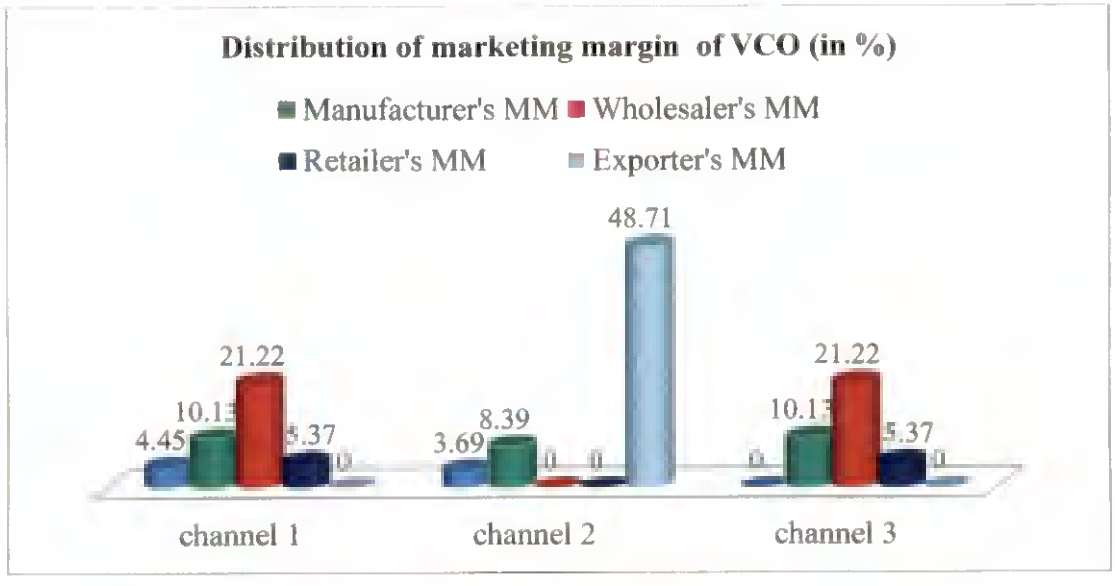


Figure 11: Distribution of margin among different marketing agents of VCO

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4.4.3.3 Price spread of desiccated coconut

The price spread for desiccated coconut was calculated for three marketing channel (Table 18). The price spread in channel 1 (F-C-M-W-R-C) was Rs 80 and Rs 67.5 for channel 2 (F-M-W-R-C). The first channel showed a higher price spread which is an indication of involvement of intermediaries in the channel. The channel 2 is efficient as the price spread was least as compared to the other channel and the producers share on consumer rupee was the highest (55per cent).

Table 18: Price spread of Desiccated coconut

Sl. No.	Price spread	Channel 1	Channel 2	Channel 3
1.	Farmer's selling price	70	82.5	70
	Production cost	103.6	103.6	103.6
	Net price received by farmer	-33.6	-21.1	-33.6
2.	Commission agents selling price	82.5	-	82.5
	Marketing cost	0.25	-	0.25
	Marketing margin	12.25	-	12.25
3.	Manufacturer's sales price	138	138	138
	Marketing cost	35.20	22.69	35.20
	Marketing margin	32.37	32.37	32.37
4.	Wholesaler's sales price	145	145	-

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	Marketing cost	0.5	0.5	-
	Marketing margin	6.55	6.55	-
5.	Retailer sales price	150	150	-
	Marketing cost	0.5	0.5	-
	Marketing margin	4.5	4.5	-
6.	Exporter sales price	-	-	149
	Marketing cost	-	-	1.44
	Marketing margin	-	-	9.56
6.	Consumer's purchase price	150	150	149
	Total marketing cost	36.44	23.94	38.76
	Total marketing margin	43.56	43.56	41.24
	Price spread	80	67.5	79
	Producer's share in consumers' rupee	46.667	55.00	46.98

In the third channel which was characterized by the exporters, the price spread and marketing costs were high. The selling price of desiccated coconut in international market was lower as compared to domestic price during the study period and it was a trend observed in the pricing behavior of desiccated coconut. The producer's share in consumer's rupee was the highest for the channel 2 (F_M_R_C) (Figure 12), 55 per cent, and the marketing cost was the least due to the low involvement of intermediaries.. The marketing margin was the same for channel 1 and 2 (29.04 per cent). The marketing cost was low for channel 2(F_M_R_C). It was interesting to note that commission agents incurred a considerable amount of profit even higher than that of the exporters (Figure 13).

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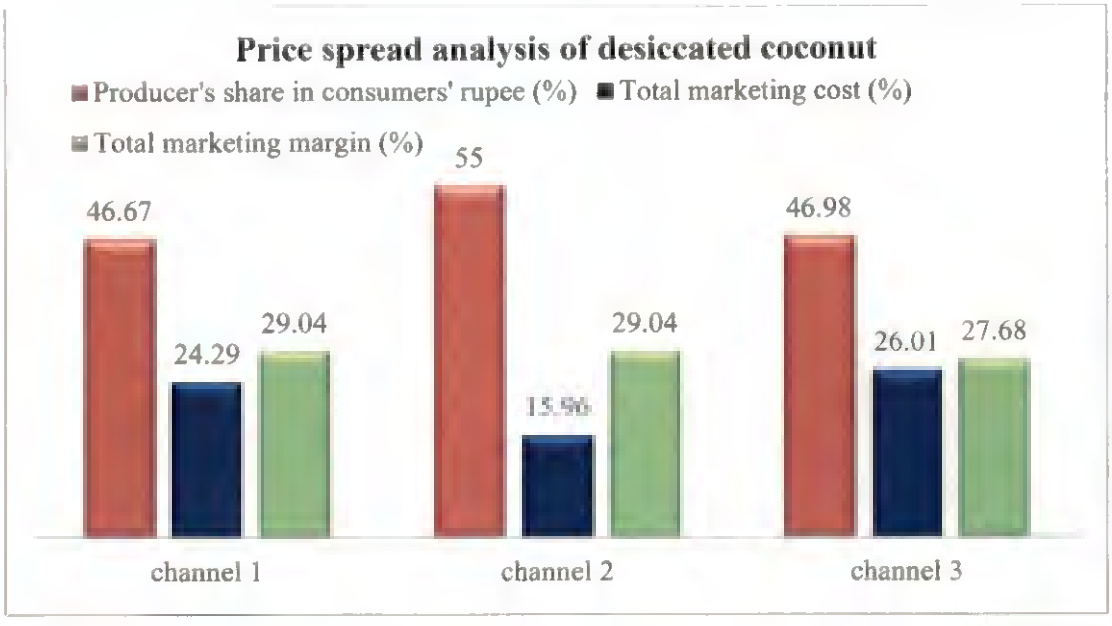

Figure 12: Price spread analysis of desiccated coconut

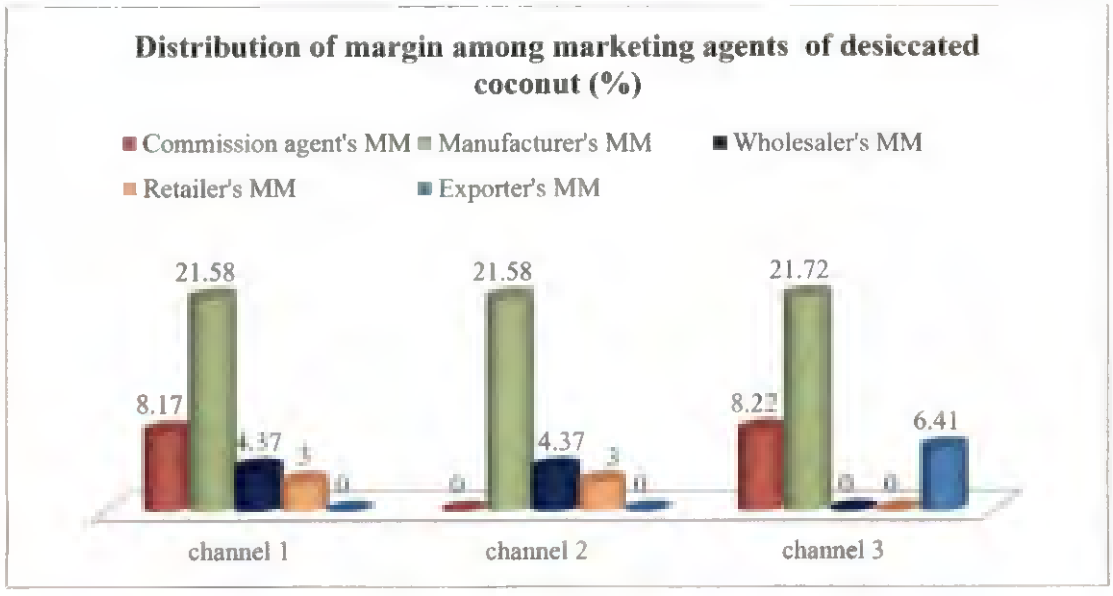

Figure 13: Distribution of margin among marketing agents of desiccated coconut

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4.4.3.4 Price spread in coconut chips

The price spread across the prominent channel in coconut chips was worked out (Table 19).The producer's share in consumer's rupee was 18.88 per cent, the least compared to other coconut products identified for study and the price spread was 36.5.

Table 19: Price spread of coconut chips (per 100 g)

Sl. No.	Price spread	Channel 1
1.	Farmer's selling price	8.50
	Production cost	10.36
	Marketing cost	0.25
	Net price received by farmer	-2.11
2.	Manufacturer's sales price	20.00
	Processing charge	13.25
	Marketing margin	6.75
3.	Retailer sales price	25.00
	Marketing cost	2.00
	Marketing margin	3.00
4.	Consumer's purchase price	25.00
	Total marketing cost	15.75
	Total margin	9.75
	Price spread	16.5
	Producer's share in consumers' rupee (%)	34.00

Marketing channels for coconut chips were not well developed as the major channel was confined to the manufacturer and retailers (F-M-R-C) Even though there

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was direct procurement of raw nut from farmers by the manufacturers, the lowest producer's share in consumers' rupee in this product may be due to the high price of the produce. The marketing cost was two times higher than the producer's share (Figure 14). The manufacturer's margin was 27 per cent and the producer's share was 34 per cent (Figure15).

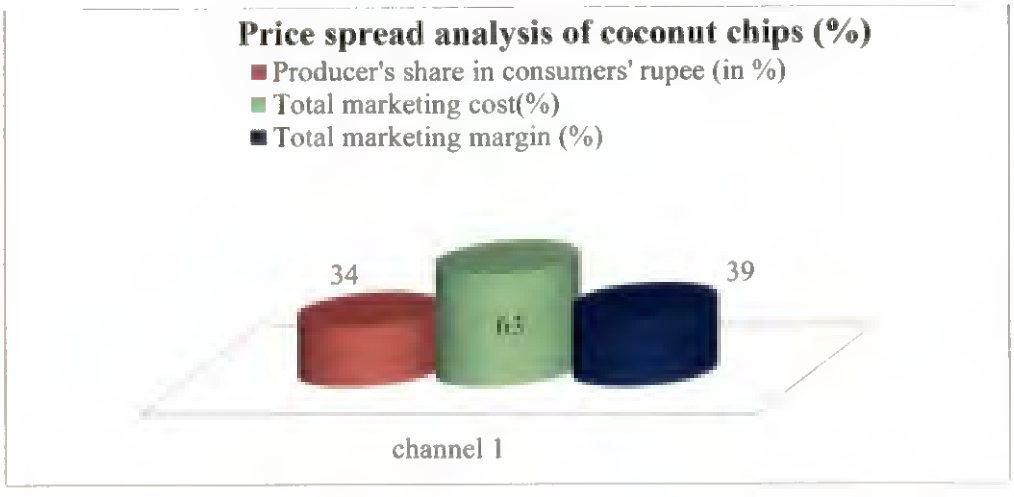

Figure 14: Price spread analysis of coconut chips

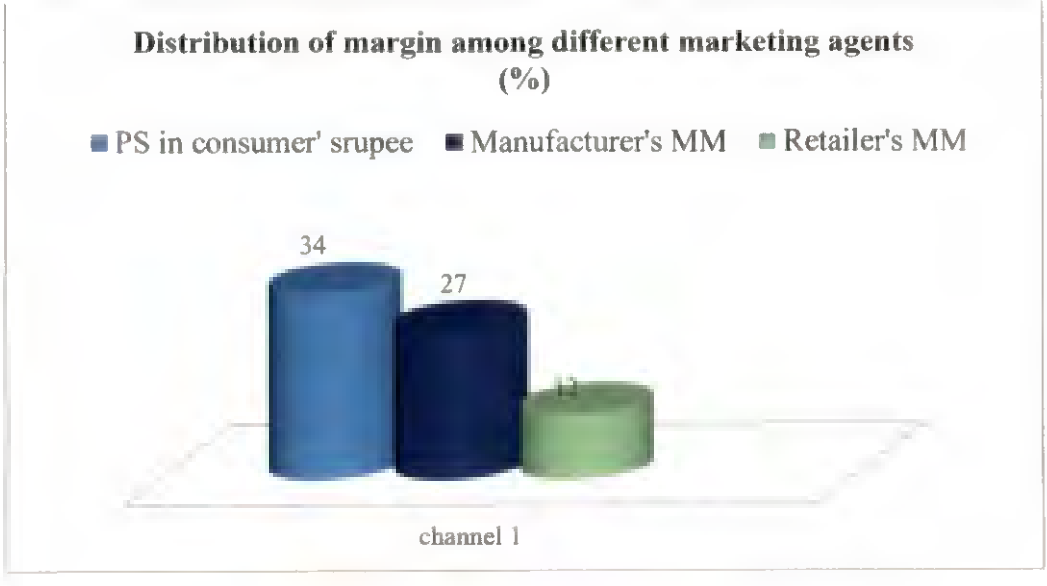

Figure 15: Distribution of margin among different marketing agents

4.4.4 The modified marketing efficiency of coconut products

Marketing efficiency is related to the cost required to move goods from the producer to the consumer and the quantity of services provided or desired by the consumer. Marketing system is considered as efficient if the cost compared with the services involved is low, and vice versa. An improvement which reduces the cost of a particular function without reducing consumer's satisfaction is an indicator of increased marketing efficiency (Chahal and Gill, 1991).

Naik and Nagaraja (2016) studied the marketing efficiency of coconut value chain in the east Godavari district of Andhra Pradesh. Marketing efficiency helps to achieve economic efficiency if the total marketing cost is low. In their study, marketing efficiency was analyzed for the three different marketing channels and they have found that the channel with fewer intermediaries as the efficient one where the marketing cost was low.

Table 20: Marketing efficiency of different channels Acharya's formula

Sl. No.	Product	Modified marketing efficiency			
		Channel 1	Channel 2	Channel 3	Channel 4
1.	Coconut oil	2.04	2.04	2.45	2.21
2.	VCO	0.41	0.32	0.52	-
3.	Desiccated coconut	0.88	1.22	0.875	-
4.	Coconut chips	0.23	-	-	-

The marketing efficiency of all the four value added products, viz., coconut oil, VCO, desiccated coconut and coconut chips were calculated (Table 20). The marketing efficiency of coconut oil was found to be higher than other three products.

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The channel 1(F-C-M-W-R-C) and channel 2 (F-C-M-E-C) had equal marketing efficiency, but compared to them, the third channel (F-M-W-R-C) was the most efficient where the farmer's profit was high and marketing cost was low. The channel 1 with high marketing cost was equivalent in marketing efficiency of channel 2 because of the higher marketing margin and low farmer's price. The study by Naik and Nagaraja (2016) also support that the marketing efficiency was lowest for longest marketing channel with intermediaries like pre harvest contractors and commission agents.

The marketing efficiency of VCO marketing channels showed that they were inefficient marketing channels compared to all other coconut products selected for study except coconut chips which was the least efficiently marketing product. The lowest marketing efficiency was due to the higher marketing cost and involvement of intermediaries in the chain. The high marketing efficiency was observed in the third channel where there were no intermediaries between the farmer and the processor.

The desiccated coconut marketing channel was efficient than VCO and coconut chips marketing channels but less efficient than coconut oil marketing channels. The most efficient channel was channel 2 (F-M-W-R-C) with marketing efficiency of 1.22 due to the absence of intermediaries between the primary producer and the processor. The marketing efficiency of the exporting marketing channel was lower than the domestic marketing channel with intermediaries in it.

The least efficient marketing channel was that of coconut chips compared to other coconut products, the efficiency can be enhanced by ensuring a reasonable return to farmers and also by reducing the processing cost.

4.5 Constraints faced by chain actors

The Garret ranking technique was used for the ranking of the constraints faced by farmers, processors, traders and the consumers.

Table 21: The constraints faced by the farmers

Constraints	Garret Score	Rank
Low marker price	66.55	1
Increased labour charge	58.55	2
Increase in cost of production	56.65	3
Labour shortage	51.5	4
Price fluctuation	48.65	5
Disease susceptibility	41.95	6
Delay in payment	34.3	7
Lack of proper marketing channel	31.9	8
Exploitation of intermediaries	22.8	9
Low yield	10.4	10

4.5.1 The constraints faced by the farmers

The main constraint identified was low market price (Table 21). The gap between the production cost of coconut and the marketing price was 3.36 per nut, which was not compensated even through the farmer's cooperative society. The low price may be due to the increased production of coconut and the low price of coconut oil. During the last year the farmer earned a higher price of Rs 14-15 per nut (The Times of India, 2016). In Kerala, the wholesale prices of coconut and coconut related products were moving in close synchronization with those of coconut oil and most of the volatility in prices of these products was associated with the unstable prices of

coconut oil, which in turn depend on the price changes in Mumbai market (Francis, 2015).

Low market price coupled with increased labour charge and increased cost of production made the situation more precarious. The cost of production of coconut was estimated as Rs 10.36 per nut. Labour shortage was the 4th constraints on the list. Pathiraja et al (2010) studied the labour availability in major coconut growing areas in Sri Lanka. He found that low wage rate, high educational status and poor social acceptability were the main reason for labour mobility from the coconut sector to the nonfarm sector.

Low price was associated with constant fluctuation in price. Francis (2015) was of the opinion that in India coconut and its products are liable to cyclical production trends and this cyclical production translates into cyclical behavior of price movements.

Disease susceptibility was the constraint next on the list. The main disease and pest incidence include root wilt and eriophyid mite attack, observed especially in the coastal areas of Kodungalloor, Chavakkadu etc. Delay in payment was also a constraint identified during the survey especially in marketing through the intermediaries. Lack of proper marketing channel was another constraint identified by the study. Harikumar (1991) was of the opinion that the marketing situation of coconut was purely monopsonistic in nature as there were many sellers but only a few buyers which in turn affect the bargaining power of farming community. While studying the cultivation and marketing problems faced by coconut growers in Udumalpet, Vanamadevi (2016) reported that high risk, price fluctuation, lack of transportation facility, storage facility and market information were the reasons that drive the farmers towards middlemen. Last but not least is the problem of low yield which also affect the farmers.

Table 22: Product specific constraints faced by processors

Coconut oil	• Shortage of raw coconut
	• Adulterated coconut oil available at cheap price
	• Labour shortage
	• Quality copra unavailability
	• Systems to ensure quality of coconut oil
Virgin coconut oil	• Productive staff
	• Raw material shortage
	• High power requirement
Desiccated coconut	• Quality raw nut shortage
	• Skilled labour shortage
Coconut chips	• Lack of big buyers
	• Low cost benefit ratio
	• High labour charge
	• Lack of skilled labour

4.5.2 Product specific constraints faced by processors

The constraints faced by coconut processors were identified through personal interview. Dearth of quality raw nut and copra were the main constraint faced by the coconut oil manufacturers (Table 22). Another major constraint that the registered manufacturers had to face was the competition from the marketers of adulterated coconut oil which was offered at lower price.

Narayana and Babu (2009) reported about the constraints faced by the coconut oil manufacturers in Tamil Nadu. The edible oil manufactures were facing problems like inefficient processing technology, uneconomical plant capacity and

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quality raw nut shortage. The study also found that the edible oil industry was dominated by middlemen and speculators. And also the processor has to withstand severe competition from cheap imported oil. Shortage of skilled labour was another problem that affects the coconut oil industry in Tamil Nadu.

The virgin coconut oil manufacturers were also suffering from the quality raw material shortage. The high power requirement was another constraint faced by the manufacturers. Skilled labour was also a limiting factor for efficient production. Pabayun et al (2009) reported the constraints in value chain of VCO which include lack of big buyers, shortfall in capital, lack of technical and entrepreneurial skill and limited quality control that affect the efficient manufacturing of VCO, in Philippines

Quality raw nut and skilled labour shortage were the main constraint faced by the manufacturer of desiccated coconut. Coconut chips manufacturers face constraints like lack of big buyers. The main marketing channel of coconut chips was through retailers, festivals and exhibitions. The main factor determining the purchase of coconut chips was price. The higher price of the produce hinders the bigger buyers from large scale purchase. The higher price is attributed by cost of moisture free packing. Skilled labour shortage and high labour charge were the other constraints identified.

Table 23: constraints faced by wholesalers and retailers

Constraints	**Garret score**	**Rank**
Financial constraints	27.25	1
Adulterated oil is available at low price	25.00	2
Price fluctuation	22.36	3
Difficulty in managing inventory level	19.95	3
Low demand for the product	14.71	4

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4.5.3 Constraints faced by wholesalers and retailers

The wholesalers, retailers and other traders were asked to rank the constraints faced by them. Financial constraint ranked the major constraint faced by them (Table 23). Adulteration of coconut oil was another problem faced by the traders. The low priced low quality oil was always a burden to both manufacturers and traders. Price fluctuation of coconut oil was the constraint reported by coconut oil traders.

The working paper on the constraints and potentials of agro processing industry by (Costales, 2010) reported the constraints faced by the agro processing industries which include credit constraints, technology weakness and limitations in raw material production supply, human resource and labour supply. Difficulty in managing inventory level was another constraint faced by the traders. Low demand for the product was the problem identified among the coconut chips manufacturers.

4.5.4 Product specific constraints faced by consumers

The ultimate consumers of the coconut based food products were asked to list the product specific constraints faced by them.

Table 24: Product specific constraints of consumers: coconut oil

Constraints	Garret score	Rank
High price	41.25	1
Adulteration	24.70	2
Poor quality ensuring system	22.40	3
Price fluctuation	18.50	4
Income shortage	18.35	5
Supply shortage	2.65	6

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4.5.4.1 Product specific constraints faced by consumers of coconut oil

High price was the first constraint identified by the consumers (Table 24). The higher price of the coconut oil may force the consumers to purchase other cheaper alternatives like palm oil and adulterated oil. Samarajeewa and Gunathilake (1999) have also reported that the consumer demand for coconut oil was shifted towards other vegetable oil as the price of former increases.

Adulterated coconut oil was another issue of concern to the consumers. The availability of impure oil is unchecked during the festival seasons like Onam. The coconut oil price rocketed to Rs. 180/ kg in 2014, during festival season in Kerala whereas the price of unbranded oil was Rs. 140/ kg, which was a blend of coconut oil with palm oil available at Rs. 60/kg(Business Standard, 2014).

There was no mechanism to ensure the quality assurance of the unbranded oil marketed through retail shops. The commissioner of food safety has recently banned 14 coconut oil brands in Kerala due to poor quality of oil. (Deccan Chronicle, 2016)

Price fluctuation was another constraint identified by consumers. The ever changing price of the oil along with income shortage, which was another constraint identified result in distraction in the monthly budget plans of consumers. Supply shortage was the last constraint that affect the consumers.

Table 25: product specific constraints faced by consumers of VCO

Constraints	Garret score	Rank
High price	52.40	1
Income constraints	37.00	2
Supply shortage	29.80	3

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4.5.4.2 Product specific constraints faced by consumers of VCO

The constraint faced by consumers include high price, income constraint and supply shortage (Table 25). Samarajewa et al (2003) have studied the marketing potential of coconut products and they suggested that price is the important factor in marketing which directly influence the purchase of the produce. The high cost of processing was the reason for higher price which in turn can be reduced by the improvement in machinery and increase the scale of production.

Table 26: product specific constraints Desiccated coconut

Constraints	**Garret score**	**Rank**
High price	60.00	1
Income constraints	47.00	2
Supply shortage	12.00	3

4.5.4.3 Product specific constraint faced by the consumers of desiccated coconut

The constraints identified in desiccated coconut include high price, income constraints and supply shortage (Table 26). Desiccated coconut is equivalent to coconut when mixed with water, hence when price of raw coconut is low, desiccated coconut powder become cost inefficient.

Table 27: products specific constraints faced by consumers of coconut chips

Constraints	Garret score	Rank
High price	95.20	1
Income constraints	71.60	2
Supply shortage	59.60	3

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4.5.4.3 Product specific constraint faced by the consumers of coconut chips

The major constraint identified for coconut chips were high price, the income constraint and supply shortage (Table 27).

4.6 Opportunities for value chain actors

Coconut is the most promising crop as every part of is finds a use which is inevitable. All the stakeholders like farmers, traders, processors, wholesalers, retailers and consumers deserves to be better off without making anybody worse off. The policy decisions are to be made on this perspective. The opportunities for the better coconut production, processing and consumption are discussed in this session.

4.6.1 Opportunities for coconut growers

Ensuring quality planting material and rejuvenation of disease affected palms which can bring about a change in quality nut production. The low price of nut was the reflection of an ever fluctuating coconut oil and copra price. The procurement of coconut by Kerafed was a solution. The CDB is encouraging the formation of a three tier structure of Coconut Producers' Society, Coconut Producers' Federation and Coconut Producers' Company, which is good intervention to organize the farmers. The policy document for the procurement of copra for the year 2016-17 also insist the coordination of the three tier farmer's cooperative for the procurement of copra. But the labour availability for harvesting of nut was the major problem faced by the farmers. The Friends of Coconut Tree (FoCT) is an innovative solution by CDB on labour shortage issue. But the effectiveness and the timely availability of the team are yet to be ensured. The womenfolk can also be trained in coconut harvesting by utilizing the mechanized coconut climbers.

The high Cost of Production (CoP) was another problem faced by the farmers. According to CACP the rising CoP can be reduced by enhancing the productivity. By augmenting increase in productivity by 10 per cent its CoP can be reduce by 5 per cent in real terms.

The CACP also address the issue of land constraint in Kerala, considering the opportunity cost for land, the productivity gap across the various states have to be narrow down. Presently the $1/3^{rd}$ of total area under coconut cultivation in the country have a productivity equal to half of the productivity of Tamil Nadu, The objectives of Technology Mission on Coconut needs to be appraised critically with reference to its objective and actual achievements.

The new value added products like tender coconut water and 'Neera' were promising value added products from coconut products, which sure attract consumer attention and fetches a better price.

4.6.2 Opportunities for processors

The product specific constraints faced by farmers were identified during the survey. The major problem faced by all of the processors was the dearth of good quality raw materials. The quality copra is inevitable for quality coconut oil production. The ample supply of adulterated coconut oil at cheaper rate was another major problem. The quality assurance of coconut oil by concerned departments like food safety and standard authority is imminent. The consumer awareness on this issue is also unavoidable. The skilled labour availability was also a constraint faced by processors. The vocational training on coconut value addition and processing technologies can be included as part of curricula for the Vocational Higher Secondary Courses was one suggestion came up as part of the interview with the processors.

The power and energy was also a constraint that needs attention. The energy efficient technologies can save the resources like energy. The lack of big buyers was

the problem faced by the processors of coconut chips; the higher price was the major hindrance to the consumer acceptability. The moisture preventive packing was the major component in increasing the price of the product. Technology development for cost effective packing and long keeping quality can reduce the price.

Increasing the scale of operation and technology improvement can bring about a change in the processing of coconut, as it reduces the cost of production and increase the consumer value. Large scale marketing options like online retailing can also be practiced for the coconut chips manufacturers.

During the course of survey period the traditional oil mills have failed to survive the financial constraints, and most of them stopped working. Government intervention for the rejuvenation of the small scale oil mills is essential.

Narayana and Babu (2009) reported the high tax burden on oil processors in the state of Tamil Nadu; they argue that the high tax rate that has to bear by the oil millers was an additional burden for the industry which is already in doldrums. The centralized tax system GST will unifies the tax system across the state and can reduce the tax burden.

4.6.3 Opportunities for wholesalers, retailers and exporters

The financial constraint was the major constraint faced by the traders. The price fluctuation was the problem faced by coconut oil traders. The support price for coconut and copra can be a solution for price fluctuation.

The major issue with regard to export competitiveness of coconut kernel products was the high domestic price, making it less price competitive in international market. Despite this fact the coconut based food products from India finds its way to international market where the Indian ethnic population is significant. The products like VCO and desiccated coconut have immense potential as an export commodity. The desiccated coconut industry in India is at infancy and the huge

domestic marketing chances made the traders to pay scant attention towards the international market (Sebastian, 2015).

According to Sebastian, (2015) the domestic desiccated coconut industry was less sensitive to the quality standards of the produce, but the international markets were really concerned about the quality of the product. So far the desiccated coconut powder industry has not taken up any worthwhile efforts to improve the product quality to international standards.

The major constraint faced by Indian exporters was the risk occurred due to the political and economic changes in the importing country and also across the world. The Export Credit Guarantee Corporation of India Ltd. assist the exporters in coping the various risks involved in the international marketing (Mahalingam, 2015).

4.6.4 Opportunities for consumers

The consumers of coconut products are the ultimate decision makers whose awareness, perception and knowledge on the coconut based food products should be taken into account and hence a consumer survey was conducted as part of the study.

Table 28: consumer's awareness on coconut oil quality

Sl . No.	Statement	Average score
1.	Coconut oil is a quality oil	2.6
2.	Coconut oil is available at reasonable price	2.8
3.	Coconut oil improves the health status	2.8
4.	Adulterated coconut oil is available in the market	2
5.	Branded oil is quality oil	2.4

4.6.4.1 Consumer's awareness on coconut oil quality

Since 100 per cent of the respondents were using coconut oil as their cooking medium an understanding on the consumer awareness on coconut oil was carried out as part of the study (Table 28). The respondents were neutral to the statement that 'coconut oil is quality oil' and 'it improves the health status'. It is in accordance with the propaganda against the coconut oil that it causes increase cholesterol level in the body. Though there were no scientific data to relate consumption of coconut oil on increased cholesterol level, the propaganda had serious impact on the consumers. Moideenkutty (2005) reported that due to the health concerns 58 per cent of the respondents abstained from coconut oil for almost 5 years.

The respondents remain neutral to the statement that 'coconut oil is available at reasonable price'. The respondent agreed to the statement of 'adulterated coconut oil is available in the market'. And also they agree to the statement that 'branded oil is quality oil' as they preferred to purchase oil as packed.

The study conducted by Moideenkutty (2005) listed the reason for preferring packed oil as easiness in transporting and handling, easiness in storage and proper labeling.

4.6.4.2 Consumer's attitude towards the use of VCO

According to Swami (2005), VCO is the purest form of coconut oil and is a major source of Lauric acid and vitamin E. It is free from trans fatty acid and is high in medium chain fats. VCO is directly consumed for weight loss treatment and it also slow down the process of ageing. The people were more concerned about their health and they were much conscious about their food choices. The virgin coconut oil is attracting worldwide attention for both internal and external application.

Table 29: Consumer attitude towards VCO

Sl. No.	Statements	Average score
1.	VCO is a quality oil in all aspects	1.4
2.	It improves the health status of consumers	1.4
3.	It has unique taste while cooking	1.8
4.	Price is reasonable when compare to the benefit	2.4
5.	Easily available	3
6.	It is high in nutrients	2

Consumer's attitude towards the use of VCO was studied during the survey (Table 29). They strongly agree to the statements like 'VCO is quality oil in all aspects' and also 'it improves health status'. The respondents agree to the fact that 'VCO has a unique taste while cooking'. Even though the price is higher as compared to other edible oils its price is reasonable when compared with the benefit.

The respondents were neutral to the statement of easy availability of the oil to all. But every respondent agree to the statement that 'VCO is high in nutrients'. The study on 'marketing potential for new coconut based high value products' by Samarajeewa et al (2003) have shown that the consumers preferred the VCO because of its colour, taste and smell and 68 per cent of the respondents even ready to show the willingness to purchase VCO even at higher price than the current price.

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4.6.4.3 Factors determining the purchase of coconut based food products

The factors that contribute to the purchase of coconut based food products like desiccated coconut and coconut chips were find out during the survey.

Table 30: Factors determining the purchase of desiccated coconut

Factor	Garret score	Rank
Easiness in cooking	66.80	1
Taste	60.60	2
Price	58.80	3
Health status	42.40	4
Easy availability	37.00	5
Long shelf life	32.60	6

The desiccated coconut was preferred by consumers because of it's role in easiness in cooking (Table 30). As the social structure of Kerala has changed the working women population also increased and hence the instant food items were a better choice by the women population.

The next factor that determines the purchase of the product was taste as it is same as that of the natural coconut when mixed with water. And also the manufacturers claim that 1kg of the produce is equivalent to 12 coconuts. Price of the product was the next factor that determines the purchase of the produce. Health status also determines the purchase of the produce. Easy availability of the produce was also a factor determining the purchase. Long shelf life was also identified as a factor in making the purchasing decision of the consumers.

The coconut chips is a product which has a potential as novel coconut based food product that can be used as a snack. The respondents were asked to rank the factors that determine the purchase of coconut chips. Price was the prime factor that determines the purchase of coconut chips (Table 31). In fact price was the factor that holds back the consumer from purchasing the chips. Taste, colour and flavor were the factors that influence the purchase decision of the consumer.

Table 31: Factors determining the purchase of coconut chips

Factor	**Garret score**	**Rank**
Price	59.8	1
Taste	56.6	2
Colour	42.4	3
Flavor	39.2	4

4.7 SWOC analysis of chain players of coconut food products value chain

The Strength, Weakness, Opportunities and Constraints analysis of value chain players of coconut based food products were carried out as part of study. Large area of staggered production and the organized farmers with better access to technology particularly from CDB was identified as the strengths of the coconut food sector. While staggered production of individual farm units with little aptitude towards value addition and the high promotion expenses of value added products were the weakness of the sector. The nutritional value of VCO, unexplored potential domestic market for desiccated coconut and promotion of the value added coconut products with tourism are the way forward for the coconut food industry. But the high cost of value addition and ensuring quality standards for the international markets were the hindrance to the opportunities identified.

Table 32: SWOC analysis of chain players of coconut food products value chain

Strength	**Weakness**
Large area under coconut cultivation in Kerala	Staggered production and low supply from individual farm units
Farmers are in the organized sector	High market promotion expense
Better access to technology	Lack of awareness about new products in rural area
Technology support from CDB	Malpractices at field level
Opportunities	**Constraints**
Secondary and tertiary processing leading to new exotic products	Stakeholders are limiting the value addition to traditional coconut products like copra and coconut
Market penetration	High production cost
Unexploited domestic market in case of desiccated coconut	Unskilled labour force
High lauric acid content in products like VCO and health conscious society	International quality standards should be maintained
Improve linkage to tourism sector to tap local market	Competition from imported products and MNCs

4.8 Policy suggestions

All the stakeholders of coconut food industry deserve to be better off without making anybody worse off. The policy decisions are to be made on this perspective. As a way forward, the following policy suggestions are recommended.

Reconsider the import oil policy which is currently ruining the domestic edible oil industry. Narayana and Babu (2009) also pointed out that the unrestricted import of edible oils under the OGL at reduced duty has affected the indigenous oil producers. It is observed that about 61.67 per cent of the edible oil industry has experienced the painful pinch of excessive imports of oils.

The support price for coconut products should be fixed based on a surveillance mechanism to ensure profitable income to the coconut farmers.

The formation of Coconut Producers' Companies is a promising intervention by CDB. It should be promoted as the way forward to the unorganized coconut farmers to become competent enough to bargain through production of value added products. The energy efficient production technologies have to be evolved for more value added products.

The promotion of novel products like 'Neera' should made through tourism. The vocational training on coconut value addition and processing technologies can be included as part of curricula for the Vocational Higher Secondary Courses was one suggestion that came up during the interview with the processors.

There should be strong law enforcement against the malpractices which affects the quality standards of value added coconut products like coconut oil.

Export promotional activities of value added coconut products like VCO and desiccated coconut should be ensured by the concerned ministry as the international market potential of these products are yet to be explored.

SUMMARY

SUMMARY

The study entitled 'Value Chain Analysis (VCA) of coconut based food products' was undertaken to assess the present circumstances prevailing in the coconut food economy of Kerala. The main focus of the study was to map the value chain of coconut based food products, to study the forward and backward linkages in the value chain, to estimate the cost and value added at successive stages, and to identify the opportunities to improve the performance of the value chain. The location selected for the study was Thrissur district of Kerala where relatively higher numbers of coconut based food industries are functioning. Value chain mapping was done to identify the prominent channels for marketing value added products selected for the study, namely, coconut oil, Virgin Coconut Oil (VCO), desiccated coconut and coconut chips.

The primary data collection was carried out through surveys and focus group discussions of various stakeholders of the coconut based food industry of Kerala. The respondents were from various strata of the sector consisting of farmers, manufacturers, wholesalers, retailers, consumers, exporters, confining the total number of respondents to seventy five.

While mapping the value chain of coconut based food products, the common channel identified for the four products was Farmers – Commission agents – Manufacturers – Wholesalers – Retailers – Consumers (F-C-M-W-R-C). The process flows from raw coconut to the final consumers were given as flow charts. Four major channels were identified for coconut oil; three each for VCO and desiccated coconut, and one prominent channel for coconut chips.

The cost of production of coconut was found out assuming the average production as 60 nuts per palm per annum. The cost was worked out to Rs. 10.36 per nut. The cost of production of copra was worked out to Rs. 55.23 per kg. Cost of production of coconut oil was computed considering a conversion rate of raw nut into

coconut oil as 30 per cent and copra into coconut oil as 60 per cent. The production cost of coconut oil from raw nut was worked out as Rs.90.72 per kg and Rs. 92.46 per kg from copra. Since there was a shortage of good quality copra, the manufacturers were interested to process raw nut into coconut oil instead of purchasing copra from traders, as the keeping quality of coconut oil depends on the quality of copra.

The cost of production of VCO was found to be Rs. 208.47 per kg and the manufacturing cost of desiccated coconut Rs. 105.63 per kg. The byproduct of the desiccated coconut manufacturing process is the parring oil which is low grade oil. The cost of production of coconut chips comes to Rs.13.5 per 100g.

Marketing cost of coconut products was found out by working out the cost involved in marketing functions like assembling, transporting, processing, grading, storage, wholesaling and retailing. The marketing cost of coconut oil was worked out for four prominent channels and it was found to be higher for the exporting-channel with Rs.16.83 per kg. For channel 3, it was Rs.7.35 per kg and was identified as the most efficient because the farmers directly sell the nuts to the manufacturers. The marketing cost of VCO was worked out for three marketing channels and the exporting marketing channel incurred lesser cost as compared to the channel with large numbers of intermediaries. In the case of desiccated coconut, out of the three channels, the exporting channel incurred the highest cost with Rs. 37.32 per kg. The second channel is characterized by the direct selling of raw nut to the manufacturers and is the efficient one compared to others with least cost of marketing of Rs.24.38 per kg. The marketing cost of coconut chips was calculated for the most prominent channel where farmers were directly selling the raw nut to the manufacturers and marketed through retailers without the involvement of wholesalers. The marketing cost was Rs.25.59 per 100g of the chips.

The price spread analysis of coconut oil revealed that the farmers being the ultimate producer suffer the biggest loss in the value chain with a loss of Rs.3.36 per

nut. The commission agent takes a profit of Rs 1.5 per nut. The price spread was the highest in channel1 (F-C-M-W-R-C) and 2 (F-Co-M-W-R-C). The producer's share in consumer's rupee was highest and the price spread was least for the channel 3 (F-M-W-R-C), without involvement of any intermediaries between farmers and the manufacturers, but the gap between cost and return remained the same. For each kg of oil produced, farmer suffered a net loss of Rs.36.32 for channel 1 and Rs.40.32 for channel 3 and hence the procurement price has to be raised in order to benefit the farmers.

An analysis of the marketing margin realized by the various intermediaries showed that in all the channels the maximum marketing margin was realized by the processor, which was the remuneration for the value addition activities they were undertaking. The farm to retail price spread for VCO exporting marketing channel was three times higher than the rest of the two channels. The producer's share on consumer's rupee was the lowest in VCO marketing channels compared to other three coconut products in the study.

The price spread for desiccated coconut was calculated for three marketing channels. The first channel showed a higher price spread which is an indication of involvement of more number of intermediaries in the channel. The channel 2 was efficient as the price spread was the least and the producers' share in consumer's rupee was the highest (55 per cent). For the third channel which includes exporters, the price spread and marketing costs were high. The marketing margin was the same for channel 1 and 2 (29.04 per cent). It was found that commission agents took away a considerable amount of profit, even higher than that of the exporters.

The price spread across the prominent channel in coconut chips was worked out. The producer's share in consumer's rupee was 34 per cent, and the price spread was 16.5 per cent. Even though there is direct procurement of raw nut from farmers by the manufacturers, the lowest producer's share in consumer's rupee in this product

may be due to the high price of the produce. The marketing cost was even higher than the producer's share. The marketing cost comes to 63 per cent where as the producers share is only 34 per cent of the consumer's price.

The marketing efficiency of the four value added products were also estimated. The marketing efficiency of coconut oil was found to be higher than other three products. The VCO marketing channels were inefficient compared to all other coconut products selected for study, except for coconut chips, which was least efficiently marketing the product. The lowest marketing efficiency is due to the higher marketing cost and involvement of intermediaries in the chain. The desiccated coconut marketing channel was efficient than VCO and coconut chips marketing channels but lower than coconut oil marketing channels.

The Garret ranking technique was used for the ranking constraints faced by the chain actors. The main constraints identified for farmers were low market price, high labour charge, increased cost of production, labour shortage, disease and pest incidence, delay in payment, lack of proper marketing channel and low yield

The product specific constraints faced by processors were identified through personal interview. Dearth of quality raw nut and copra and adulterated oil in market were the constraints faced by the processors of coconut oil. The virgin coconut oil manufacturers were facing shortage of quality raw material, high power requirement and lack of skilled labour. Quality raw nut and skilled labour shortages were the main constraint faced by the manufacturer of desiccated coconut. Coconut chips manufacturers face constraints like lack of big buyers as the main marketing channel was through the retailers, festivals and exhibitions.

The traders were asked to rank the constraints faced by them. Financial constraint, adulteration of coconut oil and price fluctuation of coconut oil were the constraints identified by the traders. High price, price fluctuation and supply shortage were the constraints faced by consumers.

The low price of nut is the reflection of an ever fluctuating coconut oil and copra prices. The farmer's cooperative formed under the auspices of CDB through which formation of a three tier mechanism of farmers viz; Coconut Producer's Society, Coconut Producer's Federation and Coconut Producer's Company can improve the bargaining power of farmers. The Friends of Coconut Tree (FoCT) is another innovative solution by CDB on the issue of labour shortage. But the effectiveness and the timely availability of the team are yet to be ensured. The womenfolk can also be trained in coconut harvesting by utilizing the mechanized coconut climbers. Large scale marketing options like online retailing can also be practiced for the coconut chips manufacturers.

The consumers of coconut products are the ultimate decision makers whose awareness, perception and knowledge on the coconut based food products should be taken into account and hence a consumer survey was conducted as part of the study. The consumers' perception on quality of coconut oil was studied and the respondents were neutral to the statements 'coconut oil is quality oil' and it improves the health status. Though there were no scientific data to relate consumption of coconut oil and increased cholesterol level in the body the propaganda had serious impact on the consumers.

The respondents remain neutral to the statement that the coconut oil is available at reasonable price. The respondents agreed to the statement that 'adulterated coconut oil was available in the market' and they prefer branded oils to ensure quality.

Consumers' attitude towards the use of VCO was also studied. They strongly agree to the statements like 'VCO is a quality oil in all aspects', 'it improves health status', 'it has a unique taste while cooking' and also 'it is high in nutritional value'. Even though the price is higher as compared to other edible oils its price is reasonable

when compared with the benefits derived from VCO. The respondents were neutral to the statement of easy availability of the oil to all.

The factors that contribute to the purchase of coconut based food products like desiccated coconut and coconut chips were found out during the survey. Easiness in cooking, taste, price, health status, easy availability and long shelf life were identified as the factors determining the purchase of desiccated coconut. Price is the prime factor that determines the purchase of coconut chips. In fact price is the factor that holds back the consumer from purchasing the chips. Taste, colour and flavour are the factors that influence the decision for purchase by the consumer.

SWOC analysis of chain players of coconut food products value chain

Strength	**Weakness**
Large scale cultivation of coconut in Kerala	Staggered production and low supply from individual farm units
Farmers are in the organized sector	High market promotion expense
Better access to technology	Lack of awareness about new products in rural area
Technology support from CDB	Malpractices at field level
Opportunities	**Constraints**
Secondary and tertiary processing leading to new exotic products	Stakeholders are limiting the value addition to traditional coconut products like copra and coconut
Market penetration	High production cost
Unexploited domestic market in case of desiccated coconut	Unskilled labour force
High lauric acid content in products like VCO and health conscious society	International quality standards should be maintained
Improve linkage to tourism sector to tap local market	Competition from imported products and MNCs

Coconut is the most promising crop as every part of it finds a use which is inevitable. All the stakeholders of coconut food industry deserve to be better off without making anybody worse off. The policy decisions are to be made on this perspective. As a way forward, the following policy suggestions are recommended.

Reconsider the import oil policy which is currently ruining the domestic edible oil industry. The unrestricted import of edible oils at reduced duty has affected the indigenous oil producers.

The formation of Coconut Producers' Companies is a promising intervention by CDB. It should be promoted as the way forward to the unorganized coconut farmers to become competent enough to bargain through production of value added products. The energy efficient production technologies have to be evolved for more value added products.

The promotion of novel products like 'Neera' should made through tourism. The vocational training on coconut value addition and processing technologies can be included as part of curricula for the Vocational Higher Secondary Courses was one suggestion that came up during the interview with the processors.

There should be strong law enforcement against the malpractices which affects the quality standards of value added coconut products like coconut oil.

Export promotional activities of value added coconut products like VCO and desiccated coconut should be ensured by the concerned ministry as the international market potential of these products are yet to be explored.

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APPENDICES

Appendix I: INTERVIEW SCHEDULE FOR FARMERS

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF HORTICULTURE, VELLANIKKARA
DEPARTMENT OF AGRICULTURAL ECONOMICS

Value Chain Analysis (VCA) of coconut based food products

Schedule of data collection from farmers

Name & address of the farmer:

Age:

Sex: male/female

Educational qualification:

a. Below SSLC
b. SSLC
c. Pre-degree
d. Graduation
e. Post- graduation
f. Others

Agriculture as occupation

a. Primary occupation
b. secondary occupation

What is the main source of income for the family?

a. Agriculture
b. Government job
c. Private job
d. Business
e. Others

Annual income of the family

a. Below Rs. 25,000
b. 25,000-50,000
c. 50,000-75,000
d.75, 000-1, 00,000
e. Above Rs.1,00,000

Years of experiencing in farming :

Total land holding:

Ownership of land:

a. Owned b. Leased in c. Leased out

Area under cultivation

Crop	Area in acre	Income

Method of coconut cultivation

a. Organic b. By using chemicals

c. Organic +chemical d. others

Animal wealth:

Whom do you approach for getting advice in coconut farming:

a. fellow farmers b. krishi bhavan c.SAU
d. CDB e. Others

Do you face any labour shortage in farming operations and post harvest practices?

Yes/No

In what form do you provide wage?

a. Cash b. Kind c. Both

Frequency of wage payment

a. Daily b. Weekly

c. Monthly d. Others

Details of labour requirement

Particulars	Hired labour		Family labour		Wage	
	Male	Female	Male	Female	Male	Female

Details of machineries:

Details of harvested nuts

Sl. No.	Particulars	Quantity (No.of units)	Units price (Rs.)
1.	Total yield		
2.	Household consumption		
3.	Seed purpose		
4.	Marketable surplus		

Through which channel you are marketing the crop

Sl.No.	Distribution Channel	Quantity	Price
1	Supplyco		
2	Private traders		
3	Private millers		
4	Co-operatives		
5	Oil processing units		
6	Krishi Bhavan		

From where do you get the assistance to market the crop?

Sl.No.	Name of agencies	Kinds of assistance
1	Farmers club	
2	Co-operatives	
3	Agriculture officers	
4	Government institutions	
5	Farmer producer companies	
6	Others	

Services rented by CDB?

Degree of participation of farmers in value chain:

Sl.No.	Activities	Degreeof participation		
		High	Medium	Low
1	Input procurement			
2	Production			
3	Marketing			

Rank the constraints faced by you in coconut cultivation:

Sl.No.	Constraints	Rank

1	Low yield	
2	Labour shorage	
3	Water resource shortage	
4	Lack of proper marketing channel	
5	Exploitation of intermediaries	
6	Increase in cost of production	
7	Low market price	
8	Others	

In what form you are selling the crop?

a. Raw coconut b. Processed(specify)

Constraints problem felt:

Suggestions to overcome the problems:

AppendixII: INTERVIEW SCHEDULE FOR PROCESSORS

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF HORTICULTURE, VELLANIKKARA
DEPARTMENT OF AGRICULTURAL ECONOMICS

Value Chain Analysis (VCA) of coconut based food products

Schedule of data collection from processors of coconut food products

Name of the unit:

Address of the unit:

Legal status / ownership:

a. Registered enterprises b. Co – operatives
c. House hold d. Others

Type of ownership:

a. Fully owned b. Partially owned

Type of mill

a. Village mill b. medium size mill c. large sized mills

Production capacity of the unit (Kg/day)

Milling hours per day?

Type of milling?

a. Custom milling (against a fee) b. Normal milling(mills buys &sells)

c. Milling contracts (govt./NGO)

From where you are procuring coconut?

a. Farm gate b. Commission agents

c. Private traders d. others

How much quantity of coconut you procured during the last 2 months?

Availability of storage facilities?

- Storage capacity?
- Normal period of storage ? (period in weeks /months)
- Reason for storing:
- How will you meet the production capacity of your plant in the case of shortage and poor availability of coconut?

a. keep the unit idle

b. Import from neighbor state

c. Stock adjustments with other processors

d. Others

- What are the criteria for fixing the price of the produce?
- How do you make the payment for the purchase?

What is the cost incurring for processing of coconut?

Sl.No.	Stages of processing	Cost per MT(in Rs)	Manpower required (No.)	Manpower wages
1	Procurement			
2	Packing			
3	Loading & unloading			
4	Processing			
5	Transportation			
6	Rent (Storage)			

Details of expenses & sale

Year	Expenses	Sales
1		
2		
3		
4		
5		

- Do you have any modern technology for processing / value addition through?
- Production ratio:
- Coconut : processed product
- What is the revenue you are getting while processing 1 kg of oil?
- Distribution channels of the produce?

Sl.No.	Distribution channel	Quantity (in MT)	Price (in Rs.)

	Supplyco		
	Retailers		
	Wholesalers		
	Direct consumers		
	Exporters		

- At what rate you are marketing other by products?

Sl.No.	By products	Distribution channel	Quantity	Rate
1	Husk			
2	Shell			
3	Oil cake			

- Whether you getting technical assistance or advises from anywhere?
- Do you maintain good relationship with other actors in the value chain?

Sl.No.	Actors	Nature of relationship	Remarks
	Yourself vs traders	Procurement	
	Yourself vs farmer producer companies	Information	
	Yourself vs supplyco	Exchange & stoke	
	Yourself vs wholesalers	Supply of coconut	
	Yourself vs consumers	Direct supply of coconut	

- Profit you get from this business?
- Is there any credit available for business?
- Do you give any credit to other stakeholders
- Details of investment

Total investment	Initial investment	Recurring investment

- Is there any competitive advantage?
- Constraints experienced in each stage of processing?
- Suggestions to overcome these constraints?

Appendix III :INTERVIEW SCHEDULE FOR WHOLESALERS AND REAILERS

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF HORTICULTURE, VELLANIKKARA
DEPARTMENT OF AGRICULTURAL ECONOMICS

Value Chain Analysis (VCA) of coconut based food products

Schedule of data collection from wholesalers and retailers of coconut food products

- Name and address of respondent:
- Age:
- Sex: male /female
- No of years experience in coconut trading?
- Type of activity undertaken:

a. coconut trading b. interstate trading

c. export d. others

- Storage capacity
- Normal capacity of storage?
- Reason for storing

a. to ensure sustainable supply b.to meet shortage of supply

c. anticipating rise in price d.others

- Whether you are undertaking any value addition process to the oil?

a. grading b. packaging

c. branding d. others (specify)

- Do you avail the service of agents in purchase of coconut? If yes how they are paid?

a. fixed salary b. fixed per unit c. commission %

- How will you transport products?

a. own transport b. hired transport

- Do you get finance or credit for your business transaction from anywhere?
- Do you sell produce for credit to the traders? If yes period of credit
- Details of expense & sales
-

Year	Expenses	Sales
1		
2		
3		
4		
5		

- Distribution channels of produce

Sl.No.	Distribution channel	Quantity	Price
1			
2			

- Whether you are getting any technical assistance from anywhere?
- Do you maintain good relation with other actors in the value chain?

Sl.No.	Actors	Nature of relationship	Remarks
	Yourself vs producers	Procurement	
	Yourself vs processing units	Producing VCO	
	Yourself vs retailers	Exchange and stock	
	Yourself vs consumers	Direct supply of coconut	

- How effectively you are managing the inventory level?
- Where are the main brands you market?
- Is there any brand preference for marketing ? if yes explain
- Who are your competitors?
- Are you satisfied with this trading?
- How is the demand for coconut products?
- Profit you get from the business
- Constraints experienced
- Suggestions to overcome existing constraints?

Appedix IV: INTERVIEW SCHEDULE FOR CONSUMERS

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF HORTICULTURE, VELLANIKKARA
DEPARTMENT OF AGRICULTURAL ECONOMICS

Value Chain Analysis (VCA) of coconut based food products

Schedule of data collection from consumers of coconut food products

1. Name and address of the respondent:
2. Age:
3. Sex: male/female
4. Educational qualification
5. What is the main source of income?
6. Annual income of the family?
7. Type and number of family members?

   a. Joint b. Nuclear family
8. Details of family members

Members	Age	Occupation
1.		

9. Are you regular consumer of coconut products?
10. Purchase details of coconut products

Sl No.	Products	Source (company outlet/ consumer fed/supermarket/retail stores)	Price	Quantity of purchase	Frequency of purchase(weekly/ fornightly/monthly)
1.	Coconut oil				
2.	Virgin coconut oil				

3.	Desiccated coconut				
4.	Neera				
5.	Others				

11.1 **Purpose on purchase of Coconut Oil**

a) Source of coconut oil: traditional milling/ market

b) Use of coconut oil: cooking oil/hair oil/others specify

c) Are you using any other type of cooking oil? Yes /No

d) If yes, please specify

e) Do you prefer branded oil? Yes/No

f) Specify the reason

g) Do you prefer packed/ or loose oil?

h) Do you prefer price/ quality in purchasing oil?

i) How you ensure quality of oil purchased? (specify)

j) Awareness on coconut oil

Sl No	**Particulars**	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
1.	Coconut oil is quality oil					
2.	Coconut oil improves the health status					
3.	Coconut oil is available at reasonable price					
4.	Adulterated coconut oil is available in the market					
5.	Colourless oil is the finest quality oil					

6.	Branded oil is superior quality					

11.2 Virgin Coconut Oil (VCO)

a) Since how long you are using VCO?

b) Are you aware of the different use and benefits of VCO? Yes/No

c) If yes to how much extent you know the uses

i. Completely aware ii. Mostly aware iii. To a little

d) How you are using VCO?

e) Which is the most attractive feature of VCO?

f) Source of information about VCO?

i. Newspaper ii. Television iii. Radio iv. Internet v. Friends & family

g) Are you willing to purchase at the current price you are paying for VCO?

h) If some retailers are offering a lower price for VCO how likely you purchase?

a. Definitely will purchase
b. Probably will purchase
c. Definitely will not purchase
d. Probably will not purchase

i) Your attitude towards VCO

Sl. No.	Statements	SA	A	NI	DA	SDA
1	VCO is quality oil in all aspects					
2	It improves health status of consumers					
3	It has unique taste while cooking					
4	Price is reasonable when compare to the benefit					
5	Easily available to all					
6	It is high in nutrients					

j). Are you satisfied with the consumption of VCO? Yes /No

k). If No, what are the improvements you needed?

l). Any health benefit experienced after using VCO?

m).Any ill effect experienced during consumption?

11.3 Desiccated Coconut (DC)

a) How long have you been using DC?

b) What are the factors determining the purchase of DC?

Sl No.	Particulars	Rank
1.	Taste	
2.	Price	
3.	Easiness in cooking	
4.	Long shelf life	
5.	Health benefit	
6.	Easy availability	

c) What is the source of information of DC?

i) News paper ii) Radio iii) Television iv) Internet v) Family & friends

d) Are you willing to pay the price now you are paying for the product?

f) Are you satisfied with the use of DC? Yes /No

g) If No, what are the improvements you need in the product?

11.4 Coconut chips

a) Have you ever tasted coconut chips?
b) Do you prefer it as snack?
c) How frequently you are purchasing/ wish to purchase coconut chips
d) Which is the source of purchase?
e) i) Supermarkets ii) wholesalers/company outlets iii) retail outlets iv) festivals v) exhibitions

f) Rank the factors determining the purchase for purchase

Sl No.	Particulars	Rank
1.	Price	
2.	Taste	
3.	Colour	
4.	Flavor	

g) Do you prefer an attractive packing for coconut chips? Yes/No

g) Are you willing to pay for the rise in price for attractive packing? Yes /No

12. Constraints faced by consumers

Sl No.	**Particulars**	**Rank**
1.	Supply shortage	
2.	Income shortage	
3.	High price	
4.	Price fluctuation	
5.	Adulteration	
6.		

ABSTRACT

VALUE CHAIN ANALYSIS (VCA) OF COCONUT BASED FOOD PRODUCTS

By

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ABSTRACT OF THE THESIS

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ABSTRACT

Coconut (*Cocos nucifera*) is one of the most useful tropical palms, almost all parts of which have various uses in both household and industrial sectors. In spite of the diverse value addition technologies developed by research institutions, the level of adoption was found to be low. A study entitled 'Value Chain Analysis (VCA) of coconut based food products' was taken up in order to identify the value chains, price spread, profitability and marketing efficiency of coconut based value added food products using the value chain analysis framework. The study also focused on the constraints faced by various chain players and measures for improving the performance of the chains.

The study was conducted in Thrissur district of Kerala, and the four products selected for the study were coconut oil, Virgin Coconut Oil (VCO), desiccated coconut and coconut chips. Focus group discussions were held to identify the key chain players involved in the value chain. Survey method was used for the primary data collection. Expert opinions were also used for arriving at conclusions.

The value chain map of each product was prepared including the product and byproduct flows. The main chain players involved were farmer/farmer cooperative, village traders, copra traders, processors, wholesalers, retailers, exporters and consumers. Coconut oil value chain involved almost all chain players. But for coconut chips large buyers like wholesalers were not present. The analysis of marketing cost showed that the costs involved were very less where the unnecessary middlemen were least involved or absent. Price spread analysis has shown that VCO has the lowest producer's share in consumers' rupee (24.04 per cent) whereas the producer's share in consumer's rupee was the highest in coconut oil (71.04 per cent). The index of Modified Marketing Efficiency (MME) was worked out which showed that coconut chips was the least efficiently marketed value added product (0.23).

Low market price increased labour charges, increased cost of production and labour shortage were the major problems faced by the farming community. Product specific constraints faced by manufacturers were also studied. Unavailability of sufficient quality raw nut and copra was a major constraint faced by the manufacturers. Financial constraints, adulteration and price fluctuations were the major constraints faced by the wholesalers. High price of the product was the major constraint faced by the consumers of coconut products. Adulteration was also identified as a major constraint faced by the consumers of coconut oil.

Ensuring continuous and large scale supply of raw nuts to the manufacturers is the primary need for the promotion of value addition in coconut. The manufacturers should adopt large scale of production with modern technology and the traders should ensure the quality standards of the products which would in turn enhance the marketing opportunities.