STAKEHOLDER ANALYSIS FOR ENHANCING THE ROLE PRIMARY PRODUCERS IN MANGO VALUE CHAINS

By

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(2015-11-070)

THESIS

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DECLARATION

I, Nadhika. K (2015-11-070) hereby declare that the thesis entitled **"Stakeholder analysis for enhancing the role of primary producers in mango value chains"** is a bonafide record of research done by me during the course of research and that it has not previously formed the basis for the award to me of any degree, diploma, fellowship or other similar title, of any other University or Society.

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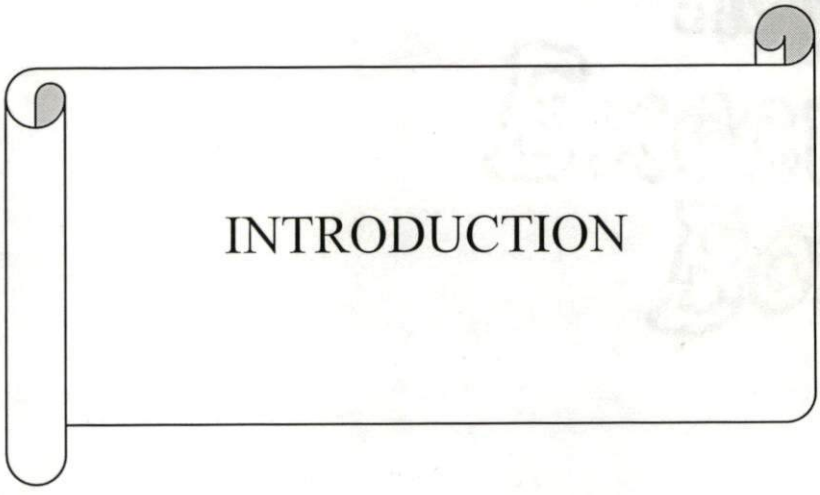
CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PLATES

LIST OF APPENDICES


INTRODUCTION

CHAPTER I

INTRODUCTION

Horticulture crops, especially fruit crops are assuming increasing prominence in the international agricultural trade. Because of their high nutritional values, they are well-chosen as a part of daily diet. Banana, citrus, grapes, apple and mangoes are the major fruits that are grown worldwide. These fruits are rich source of minerals, fiber, vitamins and provitamins. Among these fruits mango is having prime importance, hence it is called 'the king of fruits'. It is mainly grown in tropical areas and it is a part of regular diet in these areas, where it is consumed raw or after processing. Mango flaunts the fifth position in the total fruit production. It is a well preferred fruit across the world for its nutritional values. The huge varieties of refreshing flavors with sweet aroma made it the ideal candidate for commercialization all around the world. Nearly 160 mango varieties are grown globally. Moreover the increasing health consciousness of people brightens the scope and importance for mango cultivation.

The crowning mango exporting countries include Mexico, India, Brazil, Peru and the Philippines, with an export value of nearly Rs. 3728 crores. The key mango importers are the USA, the Netherlands, the European Union, the United Arab Emirates, Saudi Arabia and Bangladesh, with an approximate import value of Rs. 4682 crores (APEDA, 2016). Alphonso and Banganpally are the two varieties that are significantly exported to the USA and the European Union. Whereas in the contrary, the gulf countries prefer varieties such as Banganpally, Benette Alphonso, Totapuri, Kalapad and Imampasanth. Totapuri is a fleshy variety well-liked by the processing industries for pulp making and other processed products. Even though there is a huge demand for mangoes all over the world, it is seen that the mangoes exported from the tropical countries especially from India is banned in the European countries due to the

allegations about the presence of high dose of pesticides and unwanted pest such as fruit flies in the consignment. This has affected the mango sector drastically. But Indian mangoes are still having huge demand in Gulf countries and the Asian countries, but with a price fall of about 50 per cent. The EU ban of Indian mangoes had led to an oversupply of mangoes in the domestic market, this declined the prices, joy which was welcomed by the domestic fruit lovers (Deulgaonkar, 2014).

India is the largest mango producing and the chief exporting country in the world with an annual mango production of 18 million Metric Tons, which accounts for about 50 per cent of the global mango supply (NHB, 2015; GOI, 2016a). According to APEDA, India has exported nearly 36 thousand Metric Tons of mangoes worth Rs. 317 crores during 2015-'16. In total India has about 8.97 lakh ha dedicated to mango farming. The major mango producing states in India are Uttar Pradesh, Andhra Pradesh, Karnataka, Bihar, Gujarat, Tamil Nadu, Kerala and Maharashtra (GOI, 2016; GOI, 2017). About 30 varieties of mangoes are grown commercially, some of these varieties are Alphonso, Banganpally, Totapuri, Imampasanth, Banglora, Benette Alphonso, Malgova, Mallika, Neelam, Kesar, Amrapalli and Dashehri. The Indian mangoes are mainly exported to about 43 countries including the United Arab Emirates, the United Kingdom, Saudi Arabia, Qatar, Kuwait, the USA and few more countries, with an export value of Rs. 44,554 lakhs for a quantity of about 53 thousand Metric Tons of mangoes (APEDA, 2016).

When it comes to mango sector in Kerala, about 77.30 thousand ha is under mango cultivation during 2014-'15 with an average production of nearly 5 lakh tons. Palakkad, Malappuram and Kozhikode are the major mango growing districts of Kerala with 12 per cent, 11.1 per cent and 10.7 per cent areas respectively (GOK, 2016).

Mango is a crop that is cultivated over a substantial area in Palakkad District and it is being exported to a number of countries other than which is being sold in domestic markets. In a rural area like Palakkad, the mango industry plays a vital role

in bringing about a revolution in cultivation practices and also in the lives of mango cultivators. Muthalamada in Chittur taluk of Palakkad district, is known as the 'Mango City' of Kerala. It is located in the Kerala- Tamil Nadu border with a total geographical area of 67 sq. km and an altitude range of approximately 75-250 m, comparatively drier climate with an average annual rainfall of about 2269 mm, unique soil type varying from black soil to red soil, lime rocks, *etc.* Paddy, groundnut and coconut were the major crops cultivated, and it was within past few decades, a transition towards semi-commercialized mango industry took place. The mango orchards in Muthalamada covers around 4,500 hectares, with about 3000 mango cultivators. The annual production of mango in Muthalamada Panchayat is approximately 40,000 tons.

Muthalamada grows almost all the exquisite varieties of mangoes in India such as Alphonso, Neelam, Mallika, Malgova, Benette Alphonso, *etc.* and they all have overwhelming demand in the international market. The mangoes from Muthalamada are also famous for their flavor, taste and juiciness. However, the mango sector in Palakkad district is not devoid of any problems, which hinders its economic advancement. There are a large number of farmers growing mango and marketing is not very efficient for these farmers. A series of actors are involved in the value chain before the commodity is graded and marketed. Over dominance of these intermediaries affects the marketing margin of the primary producer. The mango sector exhibits highly elastic price pattern that in turn affects the marketing efficiency of the growers. Moreover improper plant protection measures adopted, largely due to ignorance and dearth of storage facilities accounts for poor marketability and quality of the produce.

Objective of the study

This study is formulated with five key objectives for enhancing the role of primary producers in mango value chain:

1. To identify the stakeholders in mango value chains, their functions and value share
2. To analyze the institutions and their role in mango value chain
3. To identify the marketing channels utilized by the farmers
4. To examine the price spread and marketing efficiency of the farmers
5. To understand the constraints faced by the farmers
6. To suggest value chain enhancement measures in favor of producer farmers

Scope of the study

Being one of the few substantial agricultural commodity value chains existing in Kerala, which provides hope for the farmers, the mango value chain of Palakkad district needs urgent attention to improve its performance. With the apprehensions regarding pesticide residue dangers being rife in the minds of the public, it is immediately necessary that the primary producers must be made aware of this.

Limitations of the study

This study being an M. Sc. (Ag) work, it has its inherent limitations of time frame, funds and sample size. However, all possible efforts have been taken to do a comprehensive study, paying maximum justice to the objectives at hand. The researcher being a single student had limitations for extension travel too, by way of time availability and access.

REVIEW OF LITERATURE

CHAPTER II
REVIEW OF LITERATURE

Reviewing the literature is one of the important components in a scientific research, which discusses the published information about a topic by providing an in depth knowledge about the subject. Reviewing the pervious works related to the field of study helps the researcher to identify the disparity between the currently available knowledge and areas that require further research. This allow the researcher to choose an appropriate research method to conduct the study taking into consideration all the limitations of the previous studies and choosing suitable variables and statistical tools for the interpretation. In this chapter, a systematic review of literature is done under the following sub-heads:

2.1 Value chain studies

2.2 Stakeholders involved in the value chain

2.3 Institutions involved in the value chain activities

2.4 Models and innovations in the value chain

2.5 Marketing channel and marketing efficiency of the actors

2.6 Constraints faced by the stakeholders

2.1 Value chain studies

Kaplinsky (2000) pointed out that the value chain studies can reveal the increasing gap between the various activities and its returns. He explained it in three steps:

- Mapping all the activities in the value chain with respect to the earnings achieved through each activity by different actors.
- Analyzing how the value chain of a particular firm or sector is linked to the global economy. This helps the producers to boost their activities to a more sustainable income generating path.
- Value chain analysis identifies the standardized lever which can be used for altering the disposition pattern.

Gopinath (2007) cited by Lakshmi (2014) pointed out that for rectifying the short comings in agriculture, there is a need for efficient value chain management system. He also stated that it is the competence of the different stakeholders that decides the eminence of the value chain.

According to Van Melle *et al.,* (2007) value chain comprises of a series of activities that are carried out to take a product or service from production, value addition and delivery to end users and finally dispatching after use. The value chain comprises of various actors starting from input dealers, growers, traders, exporters, processors and finally the consumers where they are involved in different activities to bring the product to the final consumers.

The value chain is a process of organizing the connected group of activities that create value by producing goods or services from basic raw materials for purchase by a consumer. The entire series of organizational work activities add value at each step

beginning with the processing of raw materials and ending with finished product in the hands of end-users (Rao and Malik, 2011). In short, the value chain is a set of activities, services and products that lead to a product or service that reaches the final consumers to satisfy their demands.

According to Anjani (2011) the major reasons for India's low crop productivity were small holdings of the farmers, insufficient accessibility of inputs, poor advisory and infrastructural support and lack of proper marketing facilities. She also point out that the value chain has an important role in reducing cost as well as creating positive externalities.

Anshul (2012) reported that the agricultural value chain in India was having many coarctation which resulted in low income generation by farmers and high inflation and food prices.

Srinivasan (2012) suggested that for attaining a sustainable value chain, the farmers should be motivated to retreat from subsistence farming and practice market based farming and also enhancing the knowledge of the farmers about the application of improved inputs and the use of innovative technologies for cultivation.

A study conducted by Aiswarya (2014) on the mango value chain of Preeja Agro Food Limited revealed the following results. The processing unit was mainly found to be dependent on the mangoes procured from Muthalamada and Wadakkancheri. The linkage of the processing unit with the farmers were through local traders. The mango growers got technical support from input dealers, traders and also fellow farmers. There was no remarkable contribution from Krishi Bhavan or Government in mango sector. The traders were the main source of information about prices of mangoes.

John (2014) and Varghese (2014) noticed that the farmers were cultivating jackfruit on the backyard of their houses and it was seen that there was a wastage of more than 55 per cent of the total jackfruit production.

Mannambeth, *et al.*, (2015) opined that if wider market connections were established by means of a value chain analysis, the villages could even manufacture products for export to neighboring districts or states.

2.2 Stakeholders involved in the value chain

In case of contracting system of mango orchard, most contracts are just verbal and social in nature and are being executed in view of a relationship and trust between the farmers and contractors. Literature survey shows that over 90 per cent of the agreements were accounted to be verbal in nature. The pre harvest contractors are overwhelming players in the mango value chain across the nation.

Mangisoni (2006) noted that smallholder farmers find it hard to get involved in the formal markets due to factors such as high transaction cost, high risks and lack of collective action.

Usually the farmers acquire market and price information from the brokers and other actors, which will be according to their interest and benefit (Akand, 2006). The intermediaries like traders and brokers get market information from fellow traders and individual observation as they have regular connection with the market (Tasnoova and Iwamoto, 2006). Commission agent is the key actor in the value chain who is involved in strategy development and improvement as he gets all the information about the price and market situation. Among the value chain actors, the retailers are the ones who has to incur most of the marketing cost whereas the wholesalers spent comparatively less.

Moreover the wholesalers get the maximum margin and so it can be concluded that the wholesalers are the actors who makes more profit when compared to the farmers.

Arshad *et al.*, (2006) identified a flux from supply chain to value chain along with a new category of intermediaries so called the packers in the upcoming markets. On the other hand, there was no variation in the farm level activities against the strict quality prescriptions enforced by the retailers which stops the smallholders from entering into the market (Arshad and Rahim, 2008).

Matin *et al.*, (2008) noticed that there was a twofold increase in the price of the produce at long distance market when compared to the price received at the farm gate. He also added that the price of the produce is directly proportional to the number of intermediaries.

Msabeni *et al.*, (2010) identified that the stakeholders comprising of the input dealers, farmers, wholesalers, retailers, exporters, processors and the final consumers expressed weak linkage as they work independently and information is not well conveyed among them due to their huge numbers.

In the case of Makueni County, Mwangangi *et al.*, (2012) found that in Makueni the farmers within a producer group operates in an isolated way as they have weak linkage with each other and this lead them to come into agreement with traders who provide them higher price.

Harikrishnan (2014) studied the value chain of cashew nut on Safalam project in Kasargod District. He identified that the cashew farmers were not organized and

were operating individually, this was the main reason for their restricted negotiation power.

Krishnan (2014) noticed that the farmers were unable to negotiate with the agents for fair price as they were unaware about the market price. In case of the cashew nut value chain, the processing units add more value, so that the value of the processed nut was ten times the value of raw nut.

Jose (2014) concluded that the farmers got information and technical support from friends, relatives and also private agents. Krishi Bhavan did not play any role in providing technical knowledge to farmers. Price related information were availed from agents and local markets.

George (2014) observed that majority of the respondents were cultivating pineapple in leased lands. They intercropped pineapple with rubber for meeting cultivation expenses and it ensured better yield. Major portion of the produce was marketed through wholesalers as the farmers and wholesalers were having persistent network relation. The payment was made one or two weeks after the produce is sold. The transportation cost and labour cost for loading and unloading were borne by the farmers.

Musa *et al.,* (2014) suggested that in order to make the value chain more sustainable, there needs to be a familiar actor associating both the producer and the consumer.

2.3 Institutions involved in value chain activities

Institutions involved in the agricultural marketing were more concerned about the communication, group decision and cost of execution. They facilitate low cost exchange of resources and its management and encourage the reliance for the exchange (Kirsten et al., 2008).

As noted by Fischer and Qaim (2012), Farmer Producer Organizations can equip themselves for providing extension services, quality inputs, post-harvest handling and processing. The farmers were well satisfied with the services and training provided to them related to credit, marketing, *etc*.

Imaita, (2013) stated that the mango value chain had a deficit of innovations as there was no institutional support. Such organizations/institutions can get involved in the value chain and provide services such as trainings regarding cultivation aspects, plant protection and market information and also encouraging farmers to take up novel technologies and innovations. These organizations can act as a bridge between the farmers and the research and development system as well as the government and the research system for developing policies more efficiently.

Manu (2013) reported that more than 75 per cent of the total margin was enjoyed by the farmers in case of the value chain of Chengalikodan. The farmers maintained a persistent network relation with institutions like banks, Krishi Bhavan and other advisory agencies from where they got all kind of technical knowledge. Price related information were available to farmers from local market and other agents. The farmers do not have any role in price fixation and they are the price takers.

According to Mohanan (2013), the VFPCK (Vegetable and Fruits Promotion Council of Keralam) played a major role in providing technical support to Kadali farmers. The farmers also got higher margin when they marketed the produce through VFPCK.

Swathy (2013), Arifa (2013) and Sekharan (2013) reported that the banana farmers depended on VFPCK and Krishi Bhavan for technical support. These institutions played a major role in strengthening the interest of the farmers.

Ashithadevi (2014) noted that Krishi Bhavan and *Swasraya Karshaka Samithi* were the two institutions providing technical support to the banana farmers and they maintained a persistent network relation with these institutions.

George (2014) noticed that the pineapple farmers at Mulakulam Panchayat had a remarkable linkage with the Krishi Bhavan and banks, as they got necessary advices, subsidies and financial assistance. But the linkage of farmers with Panchayat office, VFPCK and Pineapple Research Station was very low.

Stara (2014) point out that the main advantage of the pineapple farmers was that they had a strong association for marketing and they had a good linkage with the Pineapple Research Station at Vazhakulam.

Vignesh and Santhiya, (2014) suggested that the government should motivate the growers to establish cooperative societies, make the growers feel confident of assured price for their mangoes, help them start processing unit in their areas and keep them aware of the trend in the sale of mangoes in the market.

Muthini (2014) observed that more than 60 per cent of the farmers got training related to mango cultivation. Nearly 50 per cent of the farmers were frequently contacting extension officers for advisory services and also for accessing market information. It was also evident that more than 40 per cent of the farmers had membership in mango marketing groups.

Lakshmi (2014) found that the farmers got technical support and training from Krishi Bhavan. Farmers were provided with high yielding good quality seeds and were also given subsidies for seeds, fertilizers, pesticides *etc*. These have helped the farmers to reduce their cost of cultivation.

2.4 Models and innovations in mango value chain

Natawidjaja *et al.*, (2008) studied the 'Transparent Margin System', an innovative partnership model between mango producer and 'bimandiri'. This system is about openness and mutual trust wherein all the actors are well informed about their margins. The 'bimandiri' will provide services such as providing quality inputs, financial support, *etc*. to the farmers in return to the fee obtained through the sales. The farmers are also exposed to the new market, price related information through this partnership.

Yadav *et al.,* (2010) studied the innovative models for enhancing the quality of mango production and it was found that the organizations providing training regarding the cultivation practices at appropriate time period through demonstrations, availing credit support in linkage with financing institutions, providing assistance for post-harvest operations and processing and market information were more accepted by the mango producers.

Mehdi *et al.,* (2014) the Australia Centre for International Agricultural Research (ACIAR) Project advanced a 'whole chain approach' for the betterment of the market by bringing together all the stakeholders in 2006. It was aimed at taking superior quality produce to the market, thereby enhancing the availability of market information and skill among them. This approach brought the producers and the chain cooperators together so as to link the producers to bigger markets.

The Farm Concern International (FCI) introduced Passion and Mango Market Access (PAMA) Development project at Mbeere. This project ensures that the farmer is connected to different markets including export, domestic as well as processing market. This organized marketing relieved the farmers to supply the produce in time. The farmers were encouraged to form producer marketing groups and they were given trainings on quality enhancement, thereby improving their stake in the value chain by making them more competitive (FCI, 2014).

Alterfin (2016) Vert, a Kenyan Company that introduced a sustainable business model for organizing smallholders into groups. The company provided appropriate guidance to the farmers regarding the quality improvement in 'fair trade' and 'global gap' certification that provides a premium price to the farmers. The model is aimed to empower the farmers in decision making and uncovering the market information to this farmers. This model also helps to overcome the seasonal risks by creating local markets for value added products of mango and passion fruit. This model has proven to be one of the best in the global market, as it gives prime importance to the growers.

2.5 Marketing channels and marketing efficiency of the actors

Mustafa *et al.,* (2006) identified the difficulties in exporting mangoes from Pakistan due to phytosanitary norms. The exporters opined that the government was not taking any initiative to enhance the mango sector and the government policies were against the interests of the exporters. They also hinted that there was a need for discovering new markets by endorsing international standards like HACCP and European GAP instead of relying on sparse markets.

Farmer gets information about market price and other information from trader or other agents which may be according to the interest of the traders (Akand and Isoda, 2006). The stakeholders attained market information through market visits, personal observations and from other traders (Tasnoova and Iwamoto, 2006).

The field surveys were conducted in different regions of Bangladesh on different agri-product and it was found that even though the intermediaries were few in numbers, they were well coordinated in the market. So they dominate farmers and compel them to sell product at lower price as farmers have no way to bring back the product from market as it involved extra cost. This was the main reason which made the farmers sell their produce at lower price without giving any scope for negotiation (Tasnoova and Iwamoto, 2006; Rahman *et al.*, 2006; matin *et al.*, 2008).

Ogunleye and Oladeji (2007) identified that the cocoa producer selected their marketing channel based on the terms of payment, price, location of the market, cost of conveyance and grading practices.

Murthy et al. (2009) studied the marketing and post-harvest losses in fruits. He noticed that the mango farmers mainly depend on the pre-harvest contractors for marketing their produce. The post-harvest activities like grading, sorting and packing are done at the distant markets in Delhi, Gujarat and Hyderabad.

According to Msabeni *et al.*, 2010, the main reason for the depreciation of quality and price of mangoes was ignorance of the farmers about the use of gunny bags for the transportation of the produce. It was also noticed that the farmers got higher price when they sold their produce at farm gate.

Martey *et al.*, (2012) observed that the farmers chose the marketing channel based on the information available about the channel. Producers were more actively involved in marketing when they had access to transportation facility either owned or hired (Panda and Sreekumar, 2012).

Panda and Sreekumar (2012) suggested that the farmers should be organized into Producer Marketing Groups (PMGs) or cooperatives since the market is flooded with intermediaries who fix and control the price in the marketing system according to their interest without leaving any negotiation power for the farmers.

Gor *et al.,* (2012) noted that direct home consumption, fresh sale of mango at the farm gate and marketing to traders, who in turn take the produce to the market were the major marketing channels in the mango value chain.

Sarmiento *et al.*, (2012) studied the mango value chain in Philippines and he explained that the farmers were more concerned about the quality of the mangoes as they were more interested in selling their produce to the exporter rather than local traders as they got higher price.

Kumaresh and Sekar (2013) studied the marketing channel used by the farmers and it was found that the farmers did not bear any marketing cost as it was met by the pre-harvest contractor or the local trader. The channels with large number of actors displayed a low producer's share in consumer's rupee. The study also revealed that the producers were mainly dependent on broker mediated marketing followed by exporting and direct marketing. The farmers who acquired training from the producer marketing groups were mostly involved in exporting of their produce rather than depending on brokers. The producers attained profit when they marketed their mangoes to the processors or supplied to roadside vendors through commission agents.

Sekharan (2013) noticed that the farmers in Puthur Panchayat relied on the *Swasraya Karshaka Samithi* at Marottichal for marketing their produce other than VFPCK. This reduced the scope and role of private traders and farm gate traders.

Swathy (2013), Arifa (2013) and Sekharan (2013) conducted value chain studies on nendran variety of banana at Pudukkad Panchayat, Kizhakkanchery Panchayat and Puthur Panchayat respectively. It was found that the farmers were more interested to market their produce through VFPCK, as the Council provides higher price than the wholesalers.

Mohanan (2013) undertook the value chain analysis of Kadali in Mattathur Panchayat and it was found that majority of the farmers marketed their produce through Labour Cooperative Society (LCS) due to assurance of fixed price , payment settlement and no risk of price fluctuation. They avoid marketing the produce to traders due to high commission.

Stara (2014) mapped the value chain of Vazhakulam pineapple in Muvattupuzha block of Ernakulam District. The report denotes that majority of the farmers cultivated pineapple in leased land and they marketed their produce through traders, who exported the pineapple to other countries. It was estimated that only 30 percent of the total produce reaches the local market, the remaining get transported to other states or countries through agents.

According to John (2014) and Varghese (2014), the farmers got more margin when they marketed their produce directly to the processors without involving agents.

Lakshmi (2014) carried out a value chain study on cowpea in Nagalassery Panchayat of Palakkad District. The study revealed that the farmers themselves were marketing their produce and this helped them to attain more profit and reduce wastage due to mishandling.

Jose (2014) noticed that procurement of mangosteen was done by agents and retailers whereas marketing of the produce all around the country was done either directly by retailers or through wholesalers. It was found that the farmers got a slight improvement in price when they directly sold their produce to the retailers. They were satisfied with the return that they got from mangosteen cultivation.

According to Ashithadevi (2014), majority of the banana farmers depended on the Swasraya Karshaka Samithi for marketing their produce. This was due to better price given by the Samithi and provision of minimum support price during price fall. Few farmers marketed their produce through wholesalers. Farmers had no role in price fixation.

Honja *et al.* (2016) examined the mango value chain in Wolaita zone in Ethiopia and it was found that the farmers predominantly depended on the wholesalers for marketing their produce, however due to high marketing cost, their margin is comparatively lower than that of the processors.

2.6 Constraints faced by the stakeholders

The presence of different layers of intermediaries between the primary producer and the ultimate consumer is one of the reasons why the growers were not getting complete benefit for the high priced food, as they don't get market information and there is a deficit of well-organized market system.

Shinde and Sawant (1999), identified the constraints in the mango production and marketing faced by the farmers of Maharashtra. These were inadequate input supply, poor quality of mango grafts, lack of awareness about novel technology, low price provided by the intermediaries and absence of exporting facilities.

The high quality exotic varieties are usually exported and the farmers fetch a higher price through exporting rather than selling their produce in the local market. Even though there is a huge demand for mangoes in the international market, Kenyan mangoes find it difficult to compete with other suppliers due to lack of adequate inputs, incidence of pest and diseases and risk of foreign trade policies (FAO, 2003).

Khushk and Sheikh (2004) cited by Khushk *et al.* (2006) examined horticulture marketing system in Pakistan, with respect to price change. It was found that the distance of the market did not have any role in the variation in the price of the

commodity. But the high conveyance cost and losses during conveyance were the major price related problems due to poor linkage between the markets.

Kirsten *et al.,* (2008) pointed out the main reasons for the failure of the African agricultural markets were the presence of taboos and market fragmentation, which have led to lack of communication and exchange within the markets.

Yadav *et al.*, (2010) pointed out that the major constraints faced by the mango farmers were lack of knowledge about innovative mango cultivation techniques, absence of timely and inadequate scientific information, insufficient money, privation of export facilities, meagre marketing channels, *etc.*

According to Msabeni, *et al.,* (2010), dearth of market information and prices was the technicality that the agents were forcibly misusing, while this deficit of information on the correct agrochemicals has led to the use of low grade chemicals thereby affecting the quality and quantity of the produce.

According to the study conducted by Kumaresh and Sekar (2013) on the supply chain of mango in Krishnagiri district of Tamil Nadu, water scarcity was the major constraint during summer due to lack of appropriate water conservation practices followed by attack of pest and diseases as a result of improper management measures. Monopoly of traders and inadequate cold storage, unfair price, absence of proper market system and intuitional backup were the major marketing problems.

Major constraints among the Indian mango farmers noticed by Gopalakrishnan (2013) were umpteen intermediaries at various stages of the marketing channel with poor linkage, 20 to 40 percent of wastage, absence of clarity in prices, privation of

customer preferences and scanty infrastructure for storage, packaging and transportation.

Hussen and Yimer (2013), observed that majority of the respondents replied that inadequate water supply for irrigation, attack of pest and disease and lack of innovative technologies were the constraints in mango cultivation.

Swathy (2013), Arifa (2013) and Sekharan (2013) observed the important constraints faced by the farmers, which include high cost and shortage of labour, price fluctuation and uncertainty of selling price, unreasonable price of fertilizers and pesticides and high cost of irrigation. The studies also revealed that the price of the nendran banana was controlled by arrival/import of nendran from Tamil Nadu and also the quality of the produce.

About 92 per cent of the Chengalikodan is cultivated in leased land. Some of the constraints faced by the farmers include high transportation cost, lack of storage facility, poor quality of produce and lack of market information (Manu, 2013).

Mohanan (2013) pointed out the major constraints faced by the farmers were lack of good quality planting material, high cost of labour due to Mahathma Ghandi National Rural Employment Guarantee Scheme (MGNREGS), attack of pest and diseases and poor climatic condition.

Major challenges evident in the Philippine mango value chain were inadequate supply of export quality mangoes for the exporters, whereas the processors claimed that it was the privation of the import orders that was the major challenge when related to lack of availability of raw material. The growers were more concerned about the

quantity of produce, incidence of pest and diseases, high cost of inputs and unfavorable climatic conditions as their constraints during production (Briones *et al.*, 2013).

Stara (2014) analyzed the major challenges of the pineapple farmers, which includes high cost of production, difficulty to avail bank loans for leased lands, lack of storage facility, transportation to distant markets and poor marketing system.

Krishnan (2014) and Harikrishnan (2014) reported that cashew nut cultivation was done in unscientific manner and it was not commercialized in the area. Apart from this it was seen that the farmers depended on local poor yielding varieties which led to low production of nuts and the lack of support from the Government lead to replanting of rubber by the cashew farmers.

Constraints faced by the njaalipoovan banana farmers were labour shortage and high cost of inputs at the pre-production stage (Ashithadevi, 2014). Poor climatic condition and labour scarcity were experienced during production stage. Problems associated with marketing includes price fluctuations and seasonal demand (George, 2014).

Jose (2014) noted that unlike other fruit crops mangosteen was cultivated by the farmers in their own land, the cultivation was not of commercial nature.

Lack of collection agents, low price for the produce and exploitation by middlemen were the main constraints faced by the jackfruit cultivators (John, 2014 and Varghese, 2014).

Jawale and Ghulghule (2015), reported that the major constraints faced by farmers in cultivating kesar mango were winds and hail storm during flowering and

fruit setting stages, shortage of labour with high wage rate, lack of electricity and difficulties in intercultural operations.

Absence of innovative technology, unavailability of improved varieties and lack of extension and credit services were the major problems experienced during mango production. The key marketing constraints put forth by the farmers include the deficit of a farmers' cooperative to organize and support farmers in marketing activities, followed by high perishable nature of the commodity which add to the risks involved in marketing, lack of post-harvest and processing units which required to market the perishable commodity like mango in an efficient way and finally the fluctuation of price in the market (Honja *et al.,* 2016).

METHODOLOGY

CHAPTER III
METHODOLOGY

A scientifically standardized and distinctly outlaid research methodology is essential for the credibility of the study. The methodology gives a complete idea about how a research is to be conducted. This chapter describes about the methods and criteria with which the objective of the study will be analyzed. The chapter is presented in the following subheads:

3.1 Research design of the study
3.2 Location of the study
3.3 Selection of respondents
3.4 Selection and operationalization of the variables
3.5 Methods of data collection
3.6 Statistical tools used

3.1 Research design of the study

Kothari and Garg (1985) defined research design as the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. The research design in this study is exploratory in nature. An exploratory research design is conducted when there had been only few or no studies carried out related to a particular research problem. Here, a hypothetical solution is developed and it is evaluated by the investigator from an operational point of view.

Location of the study

3.2 Location of the study

Muthalamada Panchayat in Palakkad district is purposively selected for the study as it is having the largest area under mango cultivation in Kerala. Muthalamada is called 'the mango city', as it is having a substantial area under mango due to its location at the foothills of Western Ghats with a favorable drier climate along with adequate rainfall and soil type that is peachy for the tropical fruit as that of mango.

3.3 Selection of respondents

From among the mango producers in Muthalamada Panchayat, a sample of 60 farmers were selected using probability proportionate to size sampling procedure, which will represent small, medium and large mango growers.

About 30 respondents were also chosen separately representing other stakeholder groups in the value chain using random sampling and snowballing technique and their respective functions were identified.

3.4 Selection and operationalization of the variables

Selection of variables

For the respondent farmers, eighteen independent variables related to marketing efficiency of the farmers were selected based on consultations with experts for answering the research objectives. In order to measure the dependent variable marketing efficiency, questions covering various dimensions *viz.,* age; educational qualification; occupation; annual income; experience; area under mango cultivation; total area owned; ownership of land; type of cultivation; orchard type; organizational membership; marketing channel; marketing function; avenue of market; production cost; grades of mango; credit source; extension contact were prepared.

Table 1: Summary list of variables and their measurement procedure

SI.NO	Variables	
Independent variables		
1	Age	Sanjeev (1987) with modification
2	Educational qualification	Trivedi (1963) with modification
3	Occupation	Developed for the study
4	Annual income	Ramamurthy (1973) with modification
5	Experience	Sreedaya (2000) with modification
6	Area under mango cultivation	Developed for the study
7	Total area owned	Developed for the study
8	Ownership of land	Developed for the study
9	Type of cultivation	Developed for the study
10	Orchard type	Developed for the study
11	Organizational membership	Developed for the study
12	Marketing channel	Developed for the study
13	Marketing function	Developed for the study
14	Avenue of market	Developed for the study
15	Production cost	Developed for the study
16	Credit source	Developed for the study
17	Grades of mango	Developed for the study
18	Extension contact	Parimaladevi (2004) with modification
Dependent variables		
1	Marketing efficiency	Acharya and Agarwal (1987)
2	Perception	Developed for the study

Measurement of independent variables:

The operational definition and scoring for the independent variables have been conceptualized as follows:

3.4.1 Age

It is operationally defined as the number of years completed by a person at the time of investigation and it was categorized as:

Table 2: Age scoring procedure

SI No	Category	Code
1	<30 years	1
2	30-50 years	2
3	51-70 years	3
4	>70 years	4

3.4.2 Educational qualification

Educational qualification is operationally defined as the level of education attained by the respondent at the time of interview. It was measured by using the scoring procedure of Trivedi (1963) with appropriate modification.

Table 3: Education qualification scoring procedure

SI No	Category	Code
1	Primary	1
2	High school	2
3	Plus two	3
4	Graduate	4
5	Post graduate	5

3.4.3 Occupation

It is operationally defined as the line of work that the respondent undertakes which accounts for the major source of income.

Table 4: Occupation scoring procedure

SI No	Category	Code
1	Agriculture	1
2	Agriculture +business	2
3	Agriculture +government job	3
4	Agriculture +retired	4
5	Agriculture + others	5

3.4.4 Annual income

Annual income is operationally defined as the remuneration that the respondent receives from farming in an acre. It was measured based on the procedure given by Ramamurthy (1973) with appropriate modifications for the present study.

Table 5: Annual income scoring procedure

SI No	Category	Code
1	<25,000	1
2	25,000-50,000	2
3	50,000-1 lakh	3
4	>1 lakh	4

3.4.5 Experience

It is operationally defined as the number of years that the respondent is engaged in agriculture. Scaling procedure by Sreedaya (2000) was used with relevant modification needed for the study.

Table 6: Experience scoring procedure

SI No	Category	Code
1	<5 years	1
2	5-10 years	2
3	10-15 years	3
4	15-20 years	4
5	20-25 years	5
6	25-30 years	6
7	>30 years	7

3.4.6 Area under mango cultivation

This is operationally defined as the area under which the respondent practices mango cultivation taking into account both owned and leased orchards.

Table 7: Area under mango scoring procedure

SI No	Category	Code
1	<2 acres	1
2	2-5 acres	2
3	6-10 acres	3
4	11-25 acres	4
5	26-50 acres	5
6	>50 acres	6

3.4.7 Total area

Total area is operationally defined as the overall area owned by the respondent where farming is practiced. It was developed for the present study.

Table 8: Total area scoring procedure

SI No	Category	Code
1	<2 acres	1
2	2-5 acres	2
3	6-10 acres	3
4	11-15 acres	4
5	>15 acres	5

3.4.8 Ownership of land

It is operationally defined as the tenancy status of the land area under mango cultivation. It was developed for the present study.

Table 9: Ownership of land scoring procedure

SI No	Category	Code
1	Owned	1
2	Leased	2
3	Both owned and leased	3

3.4.9 Type of cultivation

Type of cultivation is operationally defined as the nature of farming carried out by the respondent with respect to the inputs used for cultivation.

Table 10: Type of cultivation scoring procedure

SI No	Category	Code
1	Organic	1
2	Inorganic	2
3	Integrated	3

3.4.10 Orchard type

Orchard type is operationally defined as the system of planting followed in the mango orchard by the respondent. It was developed to suit the present study.

Table 11: Orchard type scoring procedure

SI No	Category	Code
1	Conventional orchard	1
2	High density planting	2
3	Both / intercropping	3

3.4.11 Organizational membership

It is operationally defined as the enrollment status of respondents in various organizations. Here the respondents are allowed to choose multiple responses from among the options given. The options given include Farmer Producer Organization (FPO), cooperative society, pensioner's club, art's club, other organizations and no membership.

Table 12: Organizational membership scoring procedure

SI No	Category	Code
1	No	0
2	Yes	1

3.4.12 Marketing channel

Marketing channel is operationally defined as the path way by which the respondents market their produce. Here the respondents are allowed to choose multiple responses from among the options given. The options comprises of contracting, through trader, wholesalers, retailers, collection agent, consumers and others.

Table 13: Marketing channel scoring procedure

SI No	Category	Code
1	No	0
2	Yes	1

3.4.13 Marketing function

It is operationally defined as the activities carried out by the respondents while marketing the produce. Here the respondents are allowed to choose multiple responses from among the options given. The options encompasses grading, packing, loading and unloading, transportation and no cost.

Table 14: Marketing function scoring procedure

SI No	Category	Code
1	No	0
2	Yes	1

3.4.14 Market avenue

Market avenue is operationally defined as the location of market where the respondents sell their produce. For the present study, the main item of observation was the per cent of produce marketed through the local market, which will thus indicate per cent of produce marketed through outside markets.

Table 15: Market avenue scoring procedure

SI No	Category	Code
1	>50% through local market	1
2	25-50% through local market	2
3	<25% through local market	3

3.4.15 Production cost

It is operationally defined as the cost incurred annually by the respondent for per acre cultivation of mango.

Table 16: Production cost scoring procedure

SI No	Category	Code
1	10,000-20,000	1
2	20,000-30,000	2
3	30,000-50,000	3
4	50,000-75,000	4
5	75,000-1 lakh	5

3.4.16 Credit source

It is operationally defined as the agency or a person that providing credit or financial support to the respondent. Here the respondents are allowed to choose multiple responses from among the options given. The multiple responses were analyzed using SPSS by using the scoring procedure given in Table 17 for the each

available option. The options include, banks, financers, traders, relatives, friends and others.

Table 17: Credit source scoring procedure

SI No	Category	Code
1	No	0
2	Yes	1

3.4.17 Grades of mango

Grades of mango is operationally defined as the quality of mango produced by the respondents in terms of percentage.

Table 18: Grades of mango scoring procedure

SI No		Category	Code
1	Grade 1	<25%	1
		25-50%	2
		>50%	3
2	Grade 2	>50%	1
		25-50%	2
		<25%	3
3	Grade 3	>50%	1
		25-50%	2
		<25%	3

3.4.18 Extension contact

Extension contact is operationally defined as the degree of association of the respondents with the extension personnel. The measurement is based on the scoring procedure by Parimaladevi (2004) with modifications suited for the study.

Table 19: Extension contact scoring procedure

SI No	Category	Score
1	Never	0
2	Rarely	1
3	Occasionally	2
4	Frequently	3
5	Always	4

Scoring was given to each individual based on their contact with different extension agencies like Krishi Bhavan, Kerala Agricultural University, State Horticulture Mission, private agencies, *etc.* Total score was obtained for each respondent.

Table 20: Categorization based on mean and standard deviation

Category	Range	Value
High	(≥ mean + standard deviation)	≥ mean
Medium	(≥ mean + standard deviation)+ (≤ mean - standard deviation)	Between
Low	(≤ mean - standard deviation)	≤ mean

The respondents were categorized into high, medium and low based on their value attained after calculating the mean and standard deviation.

Measurement of dependent variable

3.4.19 Marketing efficiency

Marketing efficiency is the ratio of output to input. It was measured using the Acharya approach, where marketing efficiency was determined by comparing the efficiency of the alternate marketing channels.

$$\mathbf{MME = FP \div (MC + MM)}$$

Where MME is the modified marketing efficiency

MC is the marketing cost

MM is the marketing margin

FP is the price received by the farmer

Marketing channel

It is the path through which the agricultural commodity advance from the producers to the consumers by means of various intermediaries.

Marketing cost

It is the cost incurred by the producers and other intermediaries for carrying out various functions in the marketing channel.

Marketing margin

It is the profit earned by the intermediaries while the commodity is moved from producers to consumers by carrying out various marketing functions.

Price spread

Price spread is the difference between the producer price and consumer price for specific quantity of the produce given as percentage of the consumer's share.

3.4.20 Perception

To measure the dependent variable, 'perception' forty five perception statements were formulated for stakeholders to measure the perception about the enhancement of mango value chain for farmer inclusiveness and relevancy rating was conducted for these statements by giving it to thirty judges. Finally, sixteen statements were selected and was included in the interview schedule to measure the perception of stakeholder about enhancement of mango value chain for farmer inclusiveness. The stakeholders were asked to examine the perception statements critically and to record their extent of agreement on five point likert type scale ranging from strongly agree (SA), agree (A), neutral (N), disagree (D) and strongly disagree (SD).

Table 21: Scoring procedure followed in judges rating

Particulars	Weightages
Highly relevant	4
Relevant	3
Slightly relevant	2
Not relevant	1

Table 22: Statements for measuring the perception

SI No	Statement	Options
1	Farmers are not getting timely market information	SA/ A/ N/ D/ SD
2	Farmer Producer Organization is supporting the farmers to improve their situation	SA/ A/ N/ D/ SD
3	Crowned varieties of mangoes fetch high price	SA/ A/ N/ D/ SD
4	Farmers need to take up other marketing activities/ functions	SA/ A/ N/ D/ SD
5	Farmers are unaware about the available marketing opportunities	SA/ A/ N/ D/ SD
6	Farmers are not using the market opportunity available through the Farmer Producer Organization, instead they remain in the conventional marketing itself	SA/ A/ N/ D/ SD
7	Lack proper knowledge about the control of pests and diseases by farmers affect the quality of the produce	SA/ A/ N/ D/ SD
8	Farmers mainly focus on the domestic market and give less importance to the quality requirement for exporting	SA/ A/ N/ D/ SD
9	Absence of a common collection centre where the farmers can market their produce directly	SA/ A/ N/ D/ SD
10	Lack of processing units leads to losses during surplus production	SA/ A/ N/ D/ SD
11	For enhancing farmer inclusiveness there is a need for shortening the marketing channel by eliminating intermediaries	SA/ A/ N/ D/ SD
12	Farmers mostly consult input dealers for crop management advices and recommendations	SA/ A/ N/ D/ SD

13	Muthalamada mangoes capture the early markets all over the world	SA/ A/ N/ D/ SD
14	Opportunities from quality consciousness of the consumers are not yet exploited by the farmers	SA/ A/ N/ D/ SD
15	There is no facility available for the consumer to check the trustworthiness of Muthalamada mangoes	SA/ A/ N/ D/ SD
16	Quality consciousness of the consumers increases the demand for nutritious food items like mangoes	SA/ A/ N/ D/ SD

Table 23: Scoring procedure for the statement

SI No	Particulars	Score
1	Strongly agree	5
2	Agree	4
3	Neutral	3
4	Disagree	2
5	Strongly disagree	1

3.4.21 Constraints in marketing of mangoes

Garrett ranking is used to determine the constraints faced by the farmers during marketing. For this major problems were identified through key informant interview. These constraints were then incorporated into the interview schedule and the respondents were asked to rank it. The rank given to each constraint were converted into per cent position using the following formula:

$$\textbf{Per cent position} = \frac{\mathbf{100\ (Rij - 0.5)}}{\mathbf{Nj}}$$

Where, R_{ij} is the rank for i^{th} constraint by the j^{th} individual

N_j is the number of constraints ranked by the j^{th} individual

The rank obtained is an interval on a scale where its midpoint denotes the interval, hence 0.5 is subtracted from each rank. Using the Garrett Table, the per cent position obtained is changed into score (Garrett and Woodworth, 1969). Mean score was determined from the score obtained for each constraint and they are ranked according to the mean score.

3.4.22 Stakeholder analysis

Stakeholder analysis is the identification of the key stakeholders, an assessment of their interests, and the ways in which these interests affect project riskiness and viability. Stakeholder analysis contributes to project design through the logical framework and by helping to identify appropriate forms of stakeholder participation.

Procedure for conducting stakeholder analysis

A stakeholder Table was formed by identifying the potential stakeholders. The interests of each stakeholder were identified in relation to the problems being addressed by a project and its objectives. The relative priority which the project should give to each stakeholder should be indicated. Assessment of importance and influence of the stakeholders and ranking was given according to their importance and influence in the sector. Finally by combining influence and importance, a total score was obtained and the stakeholders were arranged in descending order of their scores (DFDI, 1995).

3.4.23 Scenario analysis

The formulation of future scenarios will enable to derive policy suggestions and strategic options. The futures are formulated by identifying trends, drivers and uncertainties. The trends identified are then given ranks based on uncertainty and importance. Two trends are selected which are not too closely dependent on each other, and which could go in two contrasting directions in the future. A graph is drawn and horizontal axis and vertical axis are labelled to represent each of these two key trends. The polar ends of the axes are labelled to show the possible extremes of the future outcomes. Each quadrants are summarized. The suitable future for farmer inclusion can be identified (Vermeulen *et al.*, 2008).

3.4.24 SWOC analysis

The stakeholders comprising of growers, collection agents, development personnel, land owners and input suppliers were requested to point out the strength, weakness, opportunities and challenges of the mango sector in Muthalamada (Vermeulen *et al.*, 2008).

The strength is theoretically denote the Internal Positive Factors (IPFs), weakness denote the Internal Negative Factors (INFs), opportunities denote the External Positive Factors (EPFs) and the challenges denote the External Negative Factors (ENFs).

Steps in SWOC analysis

1. The strength, weakness, opportunities and challenges were recorded.
2. The weakness were rephrased in a positive tone without losing the central idea.
3. The strategic options were formulated from these positive statements and represented in a horizontal manner.
4. The strength (positives) and challenges (negatives) were given vertical axis.
5. Based on consultations with the experts, scores were given by comparing the strategic options with the treatments.
6. Subtotal of both the scores obtained from positive statements (ST1) and negative statements (ST2) in comparison with the strategic options was calculated.
7. Balance score was obtained by subtracting the subtotal of negative statements (ST2) from the subtotal of positive statements (ST1).
8. The strategic options having the highest scores were selected.

3.5 Method of data collection

An interview schedule was prepared based on the objective of the study in consultation with experts. Appropriate modifications were made based on their suggestions and the final interview schedule was made in Malayalam.

Primary data collection was done through individual farm visits, key informant interview and interfaces. Secondary data collection was done from research papers, office records of Krishi Bhavan.

3.6 Statistical tools used

The data collected were scored and analyzed using Statistical Package for Social Sciences (SPSS version 20). The statistical tests used for analysis and interpretation include:

3.6.1 Descriptive statistics

3.6.2 Binary Logistic Regression

3.6.3 Mann Whitney U test

3.6.1 Descriptive statistics

Distribution of respondents with respect to different variables were calculated using percentage and frequencies. The independent variables were then tabulated using cross Tables.

3.6.2 Binary Logistic Regression

The relationship between the dependent variable (marketing efficiency) and the independent variables (age, educational qualification, occupation, annual income,

experience, area under mango cultivation, total area owned, ownership of land, type of cultivation, orchard type, organizational membership, marketing channel, marketing function, avenue of market, production cost, grades of mango, credit source and extension contact) was investigated using binary logistic regression.

3.6.3 Mann Whitney U test

The distinctive characters of the two groups of respondents based on the area owned viz., Group I with respondents having less than five acres of land and Group II with respondents having more than five acres of land was analyzed for statistical significance using Mann Whitney U test.

Plate 1: Farmer's meeting conducted at Muthalamada

RESULTS AND DISCUSSION

CHAPTER IV

RESULTS AND DISCUSSION

This chapter focuses on the results derived from the study, by using suitable statistical tools and following appropriate research methodology. The results derived from the study are discussed in line with the objectives of the study with the following sub-heads.

4.1 Baseline information about the mango orchard and the farmers
4.2 Stakeholders and their role in mango value chain
4.3 Institutions and their role in mango value chain
4.4 Marketing channels utilized by the farmers
4.5 Constraints faced by the farmers
4.6 Strategic options for the enhancement of the value chain

4.1. Baseline information about the mango orchard and farmers

A total number of 60 farmers were surveyed, including farmers cum traders from Muthalamada Grama Panchayat. The socio-economic characteristics of the respondents such as age, educational qualification, primary occupation, annual income, experience, area under mango cultivation, total area, ownership of land, type of cultivation, orchard type, organizational membership, marketing channel, marketing function, avenue of market, production cost, grades of mango, credit availability, extension contact were analyzed with respect to marketing efficiency. Stakeholder

analysis, SWOC matrix analysis, scenario analysis and constraint analysis were carried out to arrive at the strategic options.

4.1.1. Age, occupation and Market Avenue of the respondents

Table 24 shows that the respondents coming under the age group of 51-70 years were mainly involved in agriculture alone (64.70 per cent) followed by the respondents having 31-50 years of age accounting for about 57.69 per cent. As far as market avenue is concerned, 50 per cent of the respondents coming under the age group of 51-70 years marketed less than 25 per cent of their produce to the local market. These results point out that the farmers with age between 51 and 70 years depended on agriculture alone and hence they were more cautious about marketing their produce. They marketed more than 75 per cent of their produce to distant markets such as Delhi, Mumbai, Ahmedabad, *etc.*

4.1.2. Education, experience and extension contact

Table 25 reveals that most of the respondents had good educational background and experience was found to be higher (more than 20 years) for respondents who had primary level education (37.50 per cent). The reason for high experience among respondents having lower level of education could be that the farmers must have started mango cultivation from an early age by dropping out of the school to undertake ancestral occupation. The extension contact was found to be medium for majority of the respondents this may be due to their good educational background.

Table 24: Distribution of respondents based on age, occupation and Market Avenue (N=60)

Age (years)	Occupation (%)					Market avenue (%)		
	Agriculture	Agriculture+ Business	Agriculture+ Government job	Agriculture+ Retired	Agriculture+ Others	>50% through local market	25-50% through local market	<25% through local market
31-50	57.69	23.07	3.85	0	15.38	15.38	57.69	26.92
51-70	64.70	14.70	0	14.70	5.88	8.82	41.18	50

Table 25: Distribution of respondents based on education, experience and extension contact (N=60)

Education	Experience (years) (%)							Extension contact (%)		
	<5	5-10	10-15	15-20	20-25	25-30	>30	Low	Medium	High
Primary	0	0	12.50	0	37.50	25	25	37.50	62.50	0
High school	0	21.05	26.32	10.53	26.32	5.26	10.53	10.53	73.68	15.79
Plus two	5.26	15.79	15.79	26.32	10.53	21.05	5.26	15.79	57.89	26.32
Graduation	0	25	12.50	12.50	37.50	12.50	0	0	100	0
Post-graduation	0	33.33	0	0	33.33	33.33	0	33.33	50	16.66

4.1.3. Ownership and type of cultivation

Table 26: Distribution of respondents based on ownership and type of cultivation

Ownership	Type of cultivation (%)	
	Organic	Integrated
Owned	48.65	51.35
Both owned and leased	21.74	78.26

Table 26 shows that, the respondents who own the orchards were distributed almost equally among organic type of cultivation (48.65 per cent) and integrated cultivation practices (51.35 per cent). Whereas, the farmers cultivating in leased land along with their own orchard tend to go for integrated cultivation practices (78.26 per cent). This depicts that the farmers cultivating in leased lands were reluctant to take risks involved while adopting organic farming. The risks include non-availability of organic inputs in large quantity, lack of efficient crop management practices, sparse market for organic produce, no guarantee for high price *etc.*

4.1.4. Area under mango, marketing channel and marketing function

Table 27 focuses on the distribution of respondents according to the area under mango, marketing channel and marketing function and it was seen that more than two third of the respondents (68.62 per cent) relied on collection agents for marketing their produce. Similar marketing channel was used by the pineapple farmers according to the study conducted by Stara (2014). This may be due to the fact that the collection agents were the most proximate and easily approachable channel actor for the farmers. With respect to marketing functions, it was observed that transportation was the major marketing function carried out by a greater number of respondents (86.67 per cent). All the other marketing functions incur higher cost when compared to transportation. Since majority of the farmers marketed their produce through collection agents, all other marketing functions were carried out by them. The farmers incurred only the transportation cost for the delivery of the produce to the collection agent. Kumaresh and Sekar (2013) also reported that the mango farmers in Krishnagiri district of Tamil Nadu did not bear any marketing cost as they marketed their produce through local traders.

Table 27: Distribution of respondents based on area under mango, marketing channel and marketing function (N=60)

Mango area (acres)	Marketing channel (%)							Marketing function (%)				
	CO	T	W	R	C	CA	Others	Grading	Packing	Loading & unloading	Transportation	No cost
<2	0	33	0	50	0	67	0	16.67	16.67	0	83.33	0
2-5	21.05	21	26.32	21.05	10.52	57.89	5.26	15.79	15.79	15.79	78.95	21
5-10	6.25	31	6.25	18.75	6.25	75	12.5	31.25	31.25	31.25	93.75	6.3
10-25	7.69	23	0	23.08	0	76.92	15.4	30.77	30.77	23.08	84.62	7.7
>50	0	33	16.66	16.66	0	67	16.7	50	50	50	100	0

CO- Contractor, T- Trader, W- Wholesaler, R- Retailer, C- Customer, CA- Collection Agent

Note: The percentage given in the Table add up to a figure more than 100 per cent, the reason for this is that the respondents use multiple channels for marketing their produce and carry out multiple marketing function.

4.1.5. Total area, annual income and production cost of the respondents

Table 28: Distribution of respondents based on total area, annual income and production cost (N=60)

Total area (acre)	Annual income Rs. /ac (%)				Production cost Rs. /ac (%)			
	<25,000	25,000-50,000	50,000-1 lakh	> 1 lakh	10,000-20,000	20,000-30,000	30,000-50,000	50,000-75,000
2-5	36.67	36.67	20	6.67	10	83.33	6.67	0
6-10	31.25	31.25	25	12.50	6.25	56.25	25	12.50
11-15	22.22	55.55	11.11	11.11	0	11.11	77.77	11.11
>15	0	40	60	0	0	80	20	0

As far as mango is concerned, there is generally no need for strict maintenance. For the important maintenance activities like agrochemical application, intercultural operations, irrigation and other infrastructural facilities (pump house, agricultural equipments, *etc.*), approximately Rs. 10,000 per acre was incurred annually. The farmers had to incur around Rs. 1,50,000 per acre for the overall establishment and maintenance of an orchard. Table 28 gives the distribution of respondents based on total area, annual income and production cost. It was found that respondents having an area more than 15 acres (60 per cent) were having the highest annual income from Rs. 50,000 - 1 lakh, whereas their production cost was only around Rs. 20,000-30,000. In case of respondents having 2-5 acres of total area, the annual income was only around Rs. 25,000-50,000 and for majority these respondents (83.33 per cent) production cost was almost similar to that of the large farmers. It could be inferred from the results that with the increase in area there is an increase in annual income and with decrease in area there is an increase in production cost.

4.1.6. Income of the mango growers

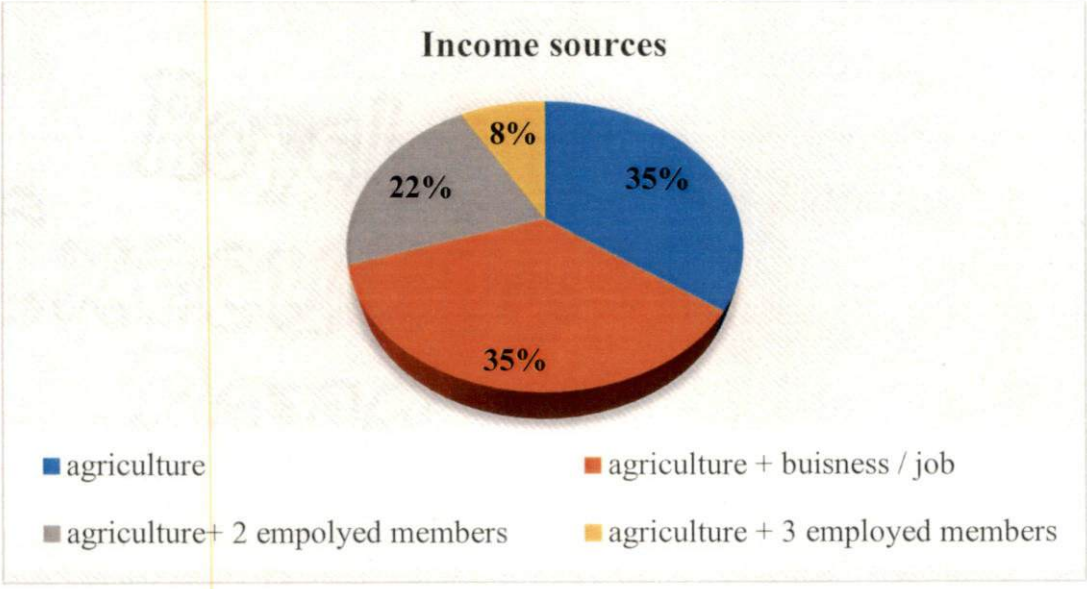


Fig. 1: Different sources of family income the mango growers

Fig. 1 shows that majority of the farmers are having more than one source of family income. About 35 per cent of the respondents depended on agriculture alone. An equal proportion of the respondents (35 per cent) was involved in agriculture along with agriculture related business activities especially as collection agents. This clearly shows that for majority of the respondents, agriculture was the key source of income.

4.1.7. Organizational membership of the respondents

Fig. 2: Organizational membership of the mango farmers

The social networking of the respondents are determined using the organizational membership status. It was found that about 51 respondents (49 per cent) were members in Farmer Producer Organization (FPO) followed by Cooperative society with 37 respondents (35.60 per cent). Two respondents had no membership in any of the organization. Unlike the findings given by Mwangangi *et al.* (2012), the study showed that the farmers had excellent social networking and that they maintained good relationship with their peer members and organizational administration.

4.1.8. Source of credit utilized by the producers

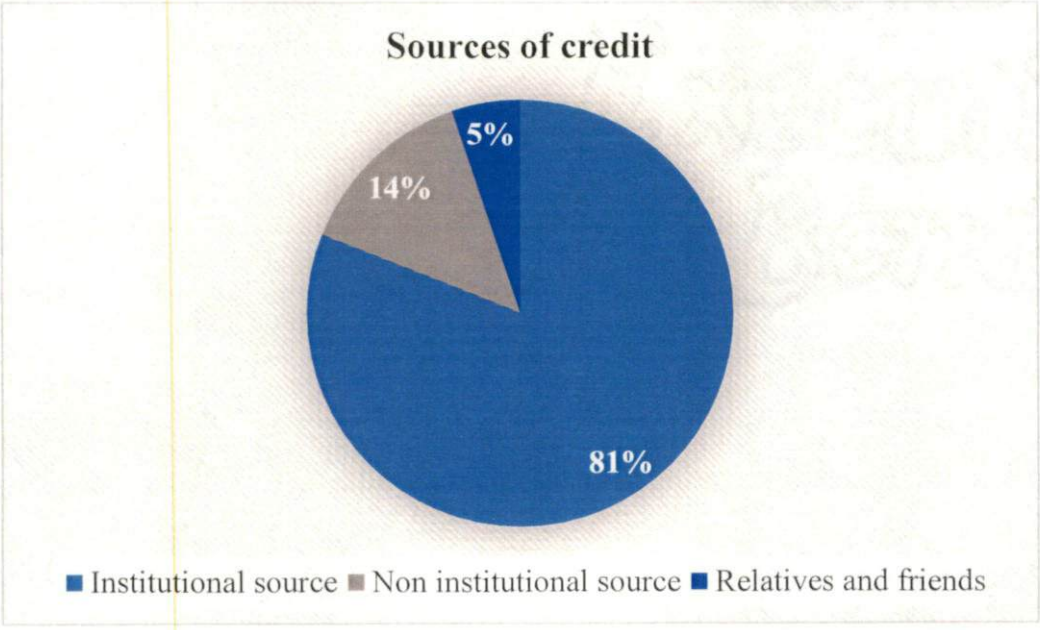


Fig. 3: Sources of credit utilized by the mango farmers

Fig. 3 reveals the credit sources utilized by the farmer, wherein it is seen that the farmers mainly depended on the institutional sources like banks for availing credit for mango cultivation (81 per cent). About 14 per cent of the respondents received credit support from non-institutional sources like traders or pawn brokers on contract basis and in return the farmers were bound to sell their produce directly to these traders. Here the source of credit is determining the marketing channel utilized by the producers.

4.1.9. Varietal distribution of mangoes grown by the respondents

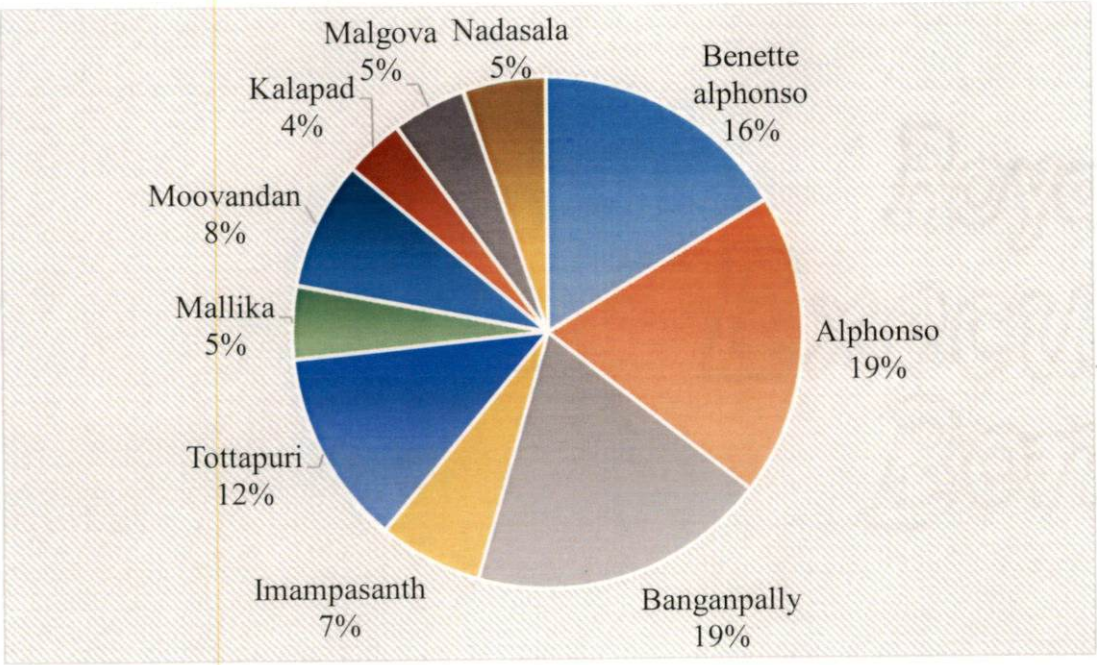


Fig. 4: Varietal diversity in Muthalamada

The varieties that are cultivated on a large scale at Muthalamada include Alphonso, Banganpally, Benette Alphonso and Thottapuri. These varieties are having huge demand in both domestic as well as export markets. Local varieties like Moovandan, Nadasala and Chakkarakutty were cultivated in a fair amount. Compared to North India, most of the South Indian varieties are early and regular bearers. This is one of the main advantages of Muthalamada mangoes. This was also reported by Shaji (2015).

4.2. Stakeholders and their role in mango value chain

The major stakeholders in the mango value chain of Muthalamada were identified using key informant interview and group discussions. Table 29 list out the stakeholders and their respective functions.

Table 29: Stakeholders and their role in mango value chain

Si no	Stakeholders	Role / Function
1	Nursery developers	Provide good quality planting materials to the farmers.
2	Input suppliers	Supply inputs such as fertilizers, pesticides, machineries, *etc.*
3	Growers	They can be either the orchard owners, leased contractors, farmer cum merchants who are involved in cultivation activities.
4	Land owners	Owners of the orchard who lease out the land on contract basis for a particular period of time. They are unaware about the marketing of the produce from their orchard.
5	Pre-harvest contractor	They take orchards for lease on contract basis for a pre fixed rate and undertake the harvesting activities and market the produce.
6	Collection agent	They own individual collection units or sheds. They procure mangoes directly from the producers. Sometimes, they are farmers themselves, and they market their produce through their shed along with the produce of other farmers.

7	Traders	They are large merchants from other states, especially North India. They procure mangoes either directly from large farmers or through the collectors and distribute to the distant market suppliers.
8	Mandi walas	Mandi walas are the wholesalers who collect the produce from the traders at the terminal market and supply the produce to retailers and processors.
9	Retailers	They are the fruit stall owners, roadside vendors and supermarkets from where the consumers buy the products. They may sell the produce as such or after value addition and processing.
10	Processors	They convert the raw product into value added products such as pulp, jams, jellies, juice, pickle and other canned products.
11	Exporters	Exporters are involved in international trade. They supply high quality fruits to other countries by taking into account their quality implications.
12	Consumers	They are the end users from within the locality to other country. With change in the area, the preference of the consumer also changes. In India, less fibrous sweet fleshy mangoes are mostly preferred.
13	Development personnel	They are extension workers of institutions such as Krishi Bhavan, research stations, University, *etc.* who provide services to the farmers and other stakeholders.

14	Local body members	They are mainly involved in political and organizational activities wherein policies regarding various aspects of value chain are formulated by them.

4.2.1 Interdependencies among the stakeholders

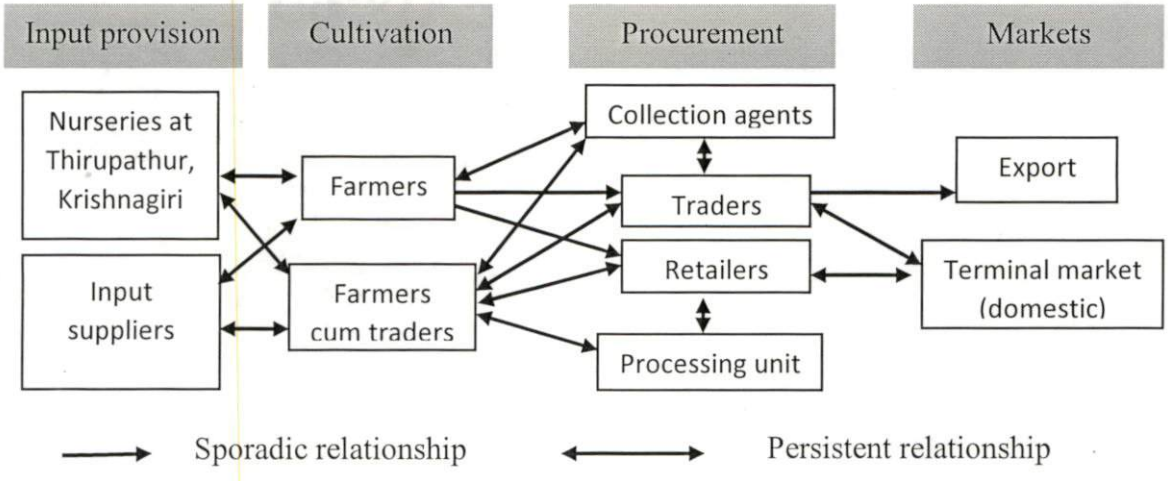


Fig. 5: Relationship and linkage between the stakeholders

In case of input provisions, the farmers and farmers cum traders showed a persistent relationship with both nursery developers and input suppliers. In the procurement stage, the farmers cum traders had more persistent relationship with the traders, retailers and processors when compared to ordinary farmers as they themselves act as the collection agent and directly market the produce to these actors. The ordinary farmer maintains only a sporadic relationship with traders, retailers and processors but they have a persistent relationship with the collection agent/ farmer cum trader. In the case of terminal market, the traders and retailers had a persistent relationship with the domestic terminal market and the collection agent and processors depended on the

traders and retailers to market the produce. The traders had only sporadic relationship with the exporters.

4.2.2 Stakeholder analysis

Table 30: Stakeholder analysis: importance-influence ranking

Si no	Stakeholder	Importance	Influence	Total
1	Nursery developers	13	14	27
2	Input suppliers	6	12	18
3	Growers	1	13	14
4	Landowners	11	11	22
5	Pre-harvest contractor	7	7	14
6	Collection agents	5	6	11
7	Traders	4	2	6
8	Processors	8	5	13
9	Retailers	9	4	13
10	Mandi walas	2	1	3
11	Exporters	10	3	13
12	Consumers	3	10	13
13	Development personnel	12	9	21
14	Local body members	14	8	22

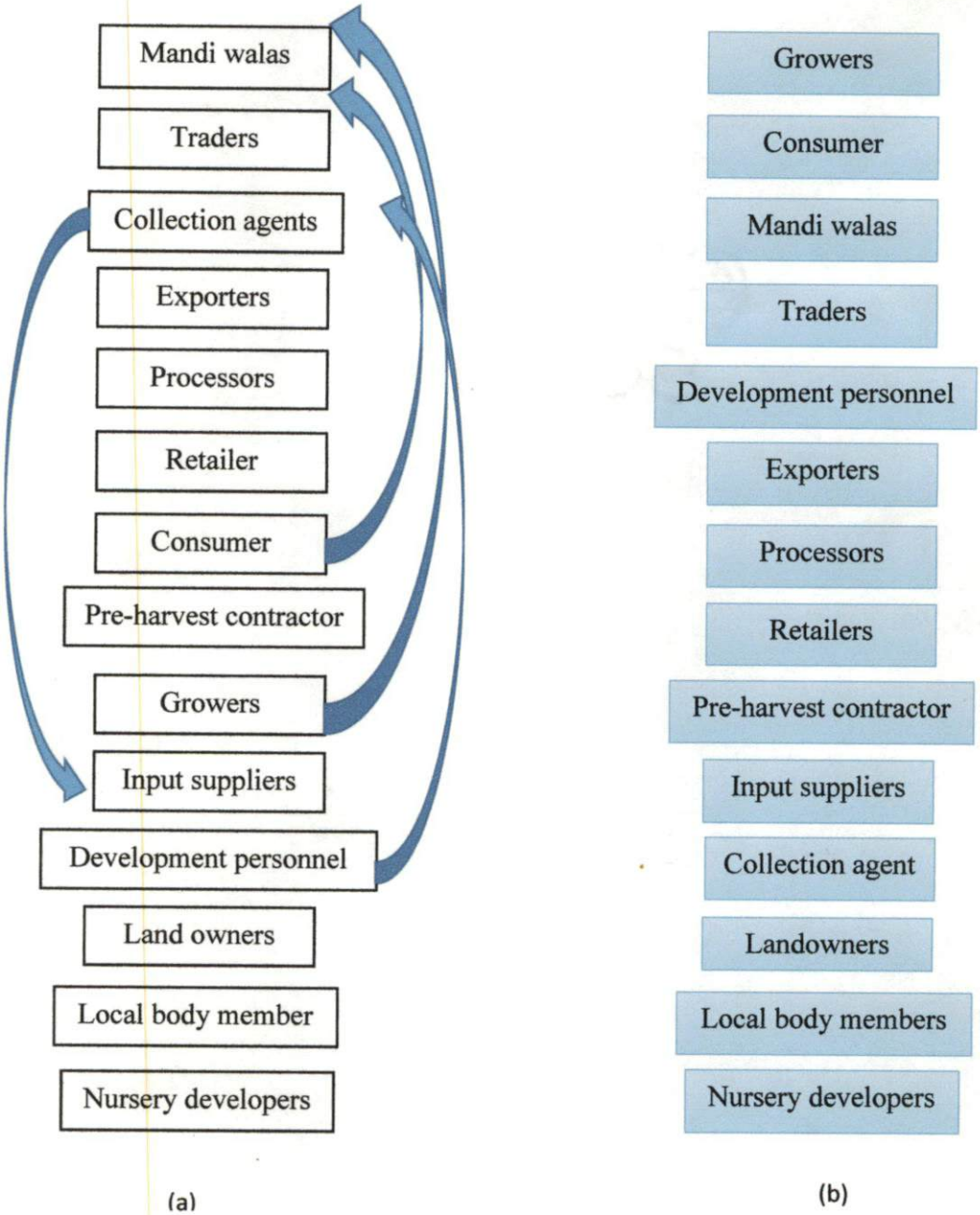


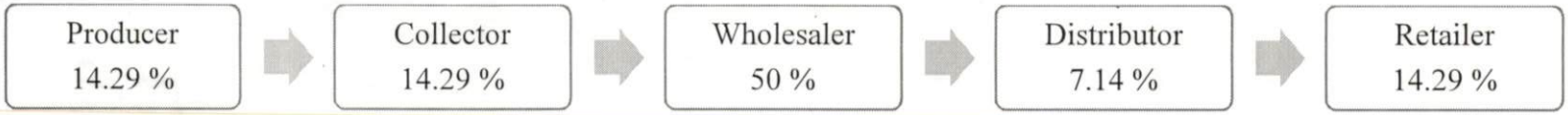
Fig. 6: Arrangement of stakeholders based on the total score

Table 30 shows the stakeholder analysis in which ranks were assigned to stakeholders based on their importance and influence and final score was obtained by adding the two. According to the scores obtained, the stakeholders are arranged in descending order in Fig. 6 (a). It was observed that the intermediaries like mandi walas, traders and collection agents were over dominating the value chain. Fig. 6 (b) shows the rearrangement of stakeholders according to the importance that should be given to each stakeholders for farmer inclusiveness wherein the growers, consumers and development personnel were given higher position in the value chain. The intermediaries like collection agents and pre-harvest contractors were given much lower position in the value chain.

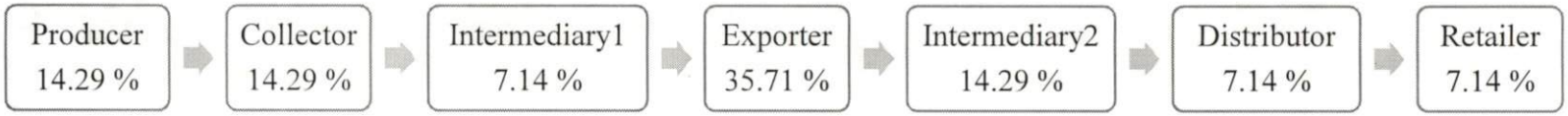
4.2.3 Value share of stakeholders

Value share of stakeholders in different markets are discussed in Fig. 7. In case of domestic market of fresh fruits, the producer's share in consumer's rupee was 14.29 per cent and the wholesaler had the highest share of about 50 per cent. The producer's share in consumer's rupee was also 14.29 per cent in export marketing channel of fresh fruits, where the highest value share was for the exporter (35.71 per cent). In case of processed products, the producer's share in consumer's rupee was comparatively higher, i.e. 23.08 per cent and the highest share was for the processor with about 26.92 per cent. From the findings it cannot be concluded that the market for processed products provide a better margin to the producers even for poor quality mangoes (grade 3 and grade 4). Domestic market and export markets are mainly for superior quality mangoes (grade 1 and grade 2).

Domestic market of fresh fruit



Export market of fresh fruit



Domestic market of processed product

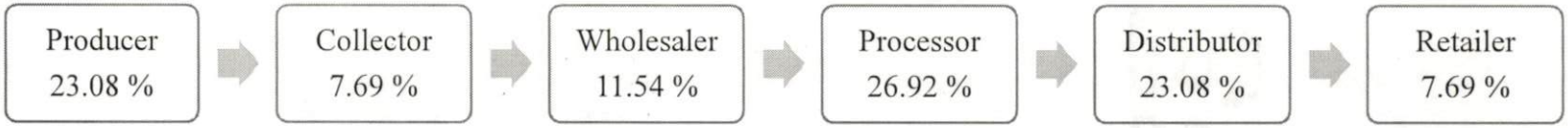


Figure 7: Value share of the stakeholders

Note: values in per cent denotes value share in consumer's price in the respective channel.

4.3 Institutions and their role in mango value chain

The key institutions involved in the mango value chain were identified using group discussion with stakeholders and key informant interview with the development personnel. Table 31 shows the institutions and their role in mango value chain.

Table 31: Institutions and their role in mango value chain

Sl no	Institution	Role
1	Krishi Bhavan	They are the institutions at the grass root level having direct linkage with the farmers. They provide extension services (advisory), trainings and information support to the farmers and other stakeholders. They implement schemes developed by the State Horticulture Mission.
2	State Horticulture Mission (SHM)	It is a nodal agency that takes care of the activities related to the cultivation of horticultural crops. It carry out various activities starting from trainings and advisory services to development of policies and schemes for horticultural crops. Mango area expansion scheme, horticulture mechanization, micro irrigation schemes were developed by the SHM for the mango farmers.

3	Agricultural and Processed Food Products Export Development Authority (APEDA)	The authoritative agency involved in the financial assistance for industries related to export, that fixes standards for the products to be exported and promotes export oriented production.
4	Farmer Producer Organization (FPO)	Muthalamada is having mainly two FPOs, Muthalamada Mango Farmers' Producer Company Ltd. and Palakkad Mango Valley Farmer Producer Company Ltd. These FPOs were established for benefit of the producers and they are working for the establishment of a transparent marketing system.
5	Chittur Agro Park	It is a modern facility for processing and export of mangoes at Muthalamada. The major activities of this unit were procurement of mangoes, post-harvest operations (cleaning, grading, sorting, packing, *etc.*), processing of mangoes (juice, jam, jelly, *etc.*) and also exporting of these products to other countries
6	National Bank for Agriculture and Rural Development (NABARD)	NABARD provides financial support to post-harvest and processing units and also for the formation of farmers clubs. Chittur Agro Park is a model processing unit recognized by SHM, which was financially supported by NABARD.

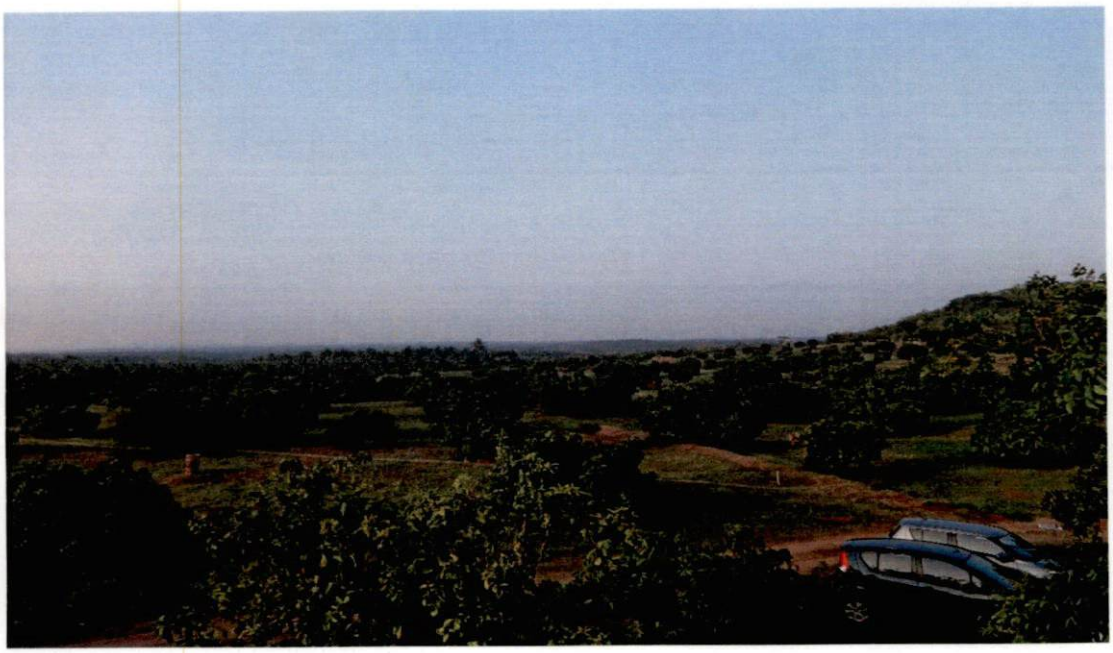


Plate 2: Farmer's club meeting and field visit

4.4 Marketing channels utilized by the farmers

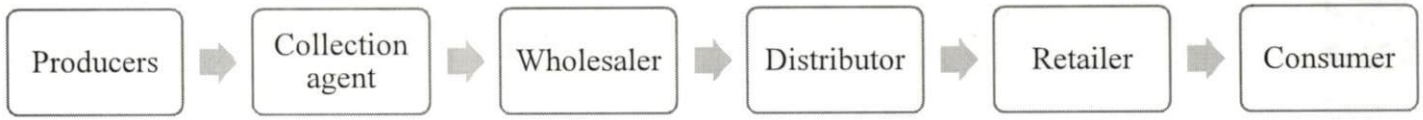
The marketing channels were mainly categorized into major marketing channels and minor marketing channels based on the frequency of usage among the farmers. The major marketing channels include six sub channels based on the grades of mangoes, wherein grade 1 mangoes were of superior quality with specified size (more than 300 g), shape and colour, that are mainly exported; grade 2 is usually the undersized mangoes with 200-300 g and uneven color that does not fulfil all the requirements for exporting; grade 3 is malformed mangoes with about 150-200 g and having external discoloration and the grade 4 mangoes are the lowest quality mangoes with pest and disease attack and having less than 150 g weight.

The minor marketing channels were rarely used by the farmers and only less than 10 per cent of the total produce is marketed through minor channels. The minor marketing channels include direct marketing from the farm gate by the farmers and also marketing to local retailers. Minor marketing channel is mainly used for grade 3 and grade 4 mangoes

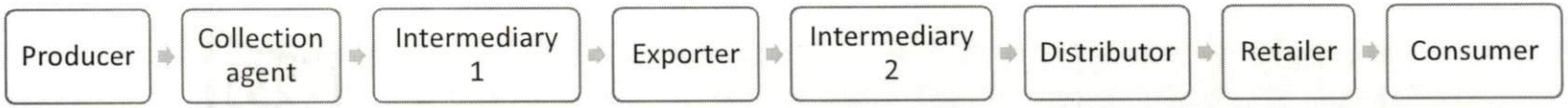
Major marketing channels

For grade 1 mango

Marketing channel 1:

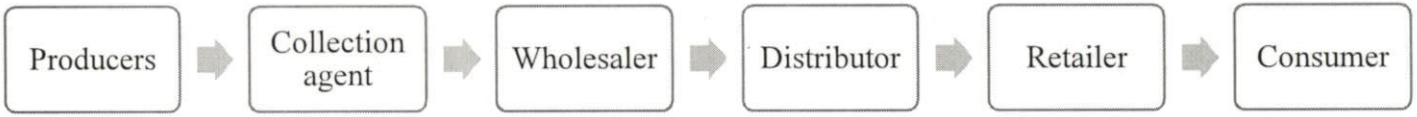


Marketing channel 2:

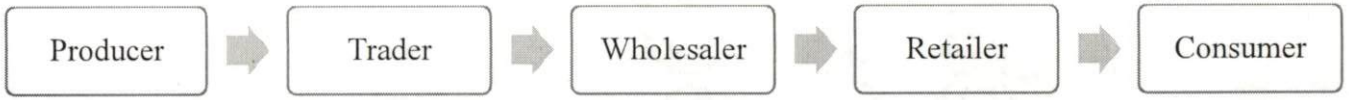


For grade 2 mango

Marketing channel 3:

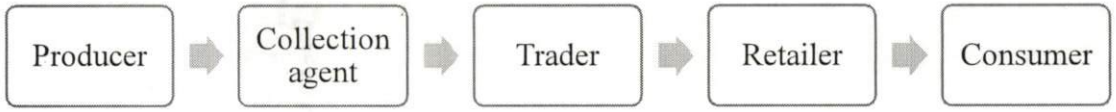


Marketing channel 4:

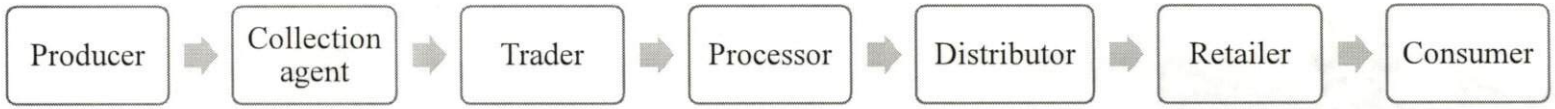


For grade 3 mango

Marketing channel 5:



Marketing channel 6:



4.4.1. Functions, agents and output at the different stages of the mango value chain

Table 32: Functions, agents and output at the different stages of the mango value chain

Stages of chain	Functions	Agents	Output
Producer	Cultivation practices (collection in some cases)	Farmers Farmers cum traders Leased farmers	Raw mango
Collection agents	Procure mangoes from different orchards and carry out post-harvest activities	Farmer cum traders Shed owners	Graded and packed mango
Local traders	Collect mangoes directly from the farmers or from collection agents	Shed owners Fruit merchants	Graded and packed mango
Mandi walas	Procure mangoes from all over the country and sell it in the key markets such as Delhi, Mumbai, Ahmedabad, *etc.*	Wholesalers Fruit merchants	Graded and packed mango
Retailers	Collect the mangoes or value added products from farmer, collection agents, traders or distributors and sell it to the consumers	Fruit shop owners roadside vendors Juice stalls Super markets	Graded mangoes Value added products (pickle, juice, jam, jelly, *etc.*)
Processors	Collect raw or ripened mangoes from traders, collection agents or farmers and make	Private and public Fruit processing units Juice stalls	Mango pulp, pickle, juice, jam, jelly and canned products

	value added processed products		
Exporters	Procure mangoes from farmers, collection agents, traders, retailers and processors and export to other countries in raw or value added product	Farmers Processing unit Exporting agencies	High quality graded and packed mangoes or value added products

Table 32 shows the functions, agents and output at the different stages of the value chain and it was noticed that an individual actor carries out more than a single function at different stages of the value chain. The farmer cum trader undertakes mango cultivation as well as carries out the procurement activities of a collection agent. In case of output, the physical transformation takes place only when the produce reaches the processor. In all other stages, only grading and packing of the produce are done.

4.4.2 Marketing efficiency for different marketing channels

In case of grade 1 mangoes both channel 1 and channel 2 were having marketing efficiency of 0.14. Marketing margin was found to be the highest for the wholesaler (52.38 per cent) and the exporting agency (40.74 per cent) in channel 1 and channel 2 respectively. For grade 2 mangoes, channel 4 was found to be more efficient (0.24) when compare to channel 3 (0.12). The highest margin was for the wholesaler in both the cases. Grade 3 mangoes were mainly sold at the local markets and for processing, wherein marketing of mangoes directly to local market was found to be efficient (0.4) whereas in case of processing it was 0.23. The margin of the producers were higher in both the channel 5 (55.56 per cent) and channel 6 (41.67 per cent) for grade 3 mangoes.

It can be can summarized that for grade 1 mangoes, the producer's share is comparatively very less hence there is a need for improvement in the marketing of grade 1 mangoes so that the producers can get fair margin for their superior quality produce. In case of grade 2 mangoes, in marketing channel 4, the producers directly sold the produce to the traders by undertaking more marketing functions (grading and packing) and hence their margin was comparatively high. The marketing efficiency was the highest for marketing channel 5 (0.4) of grade 3 mangoes since the actors involved were less compared to other marketing channels and in case processing though the producer's margin was the highest, maximum profit was taken by the processor which was also evident from Fig. 7.

Table 33: Marketing Cost, Marketing Margin and Marketing efficiency in different marketing channels for grade 1 mangoes

Grade	Marketing channel	Stakeholder	Cost (Rs.) /box of 7 kg	Selling price (Rs.) /box of 7 kg	Margin (Rs.) /box of 7 kg	Marketing efficiency
Grade 1	Marketing channel 1	Producers	5 (7.14)	100	95 (15.08)	0.14
		Collection agent	25 (35.71)	200	75 (11.90)	
		wholesaler	20 (28.57)	550	330 (52.38)	
		Distributor	10 (14.29)	600	40 (6.35)	
		Retailer	10 (14.29)	700	90 (14.26)	
		Consumer		700		
	Marketing channel 2	Producer	5 (3.12)	100	95 (17.59)	0.14
		Collection agent	25 (15.63)	200	75 (13.88)	
		Intermediary1(domestic)	10 (6.25)	250	40 (7.41)	
		Local exporting agency	30 (18.75)	500	220 (40.74)	
		Intermediary 2 (foreign)	50 (31.25)	600	50 (9.26)	
		Distributor	20 (12.5)	650	30 (5.56)	
		Retailer	20 (12.5)	700	30 (5.56)	
		Consumer		700		

Note: Figures given in the parentheses shows the value in percentage

Table 34: Marketing Cost, Marketing Margin and Marketing efficiency in different marketing channels for grade 2 mangoes

Grade	Marketing channel	Stakeholder	Cost (Rs.) /box of 7 kg	Selling price (Rs.) /box of 7 kg	Margin (Rs.) /box of 7 kg	Marketing efficiency
Grade 2	Marketing channel 3	Producer	5 (7.69)	60	55 (12.64)	0.12
		Collection agent	25 (38.46)	150	65 (14.94)	
		Wholesaler	20 (30.77)	400	230 (52.87)	
		Distributor	10 (15.38)	450	40 (9.20)	
		Retailer	5 (7.69)	500	45 (10.34)	
		Consumer		500		
	Marketing channel 4	Producer	25 (38.46)	120	95 (21.84)	0.24
		Trader	20 (30.77)	250	110 (25.29)	
		Wholesaler	10 (15.38)	400	140 (32.18)	
		Retailer	10 (15.38)	500	90 (20.69)	
		Consumer		500		

Note: Figures given in the parentheses shows the value in percentage

Table 35: Marketing Cost, Marketing Margin and Marketing efficiency in different marketing channels for grade 3 mangoes

Grade	Marketing channel	Stakeholder	Cost (Rs.) /box of 7 kg	Selling price (Rs.) /box of 7 kg	Margin (Rs.) /box of 7 kg	Marketing efficiency
Grade 3	Marketing channel 5	Producer	5 (20)	30	25 (55.56)	0.4
		Collection agent	5 (20)	40	5 (11.12)	
		Trader	10 (40)	60	10 (22.20)	
		Retailer	5 (20)	70	5 (11.12)	
		Consumer		70		
	Marketing channel 6	Producer	5 (8.33)	30	25 (41.67)	0.23
		Collection agent	5 (8.33)	40	5 (8.33)	
		Trader	10 (16.67)	55	5 (8.33)	
		Processor	25 (41.67)	90	10 (16.67)	
		Distributor	10 (16.67)	120	10 (16.67)	
		Retailers	5 (8.33)	130	5 (8.33)	
		Consumer		130		

Note: Figures given in the parentheses shows the value in percentage

4.4.3. Cost of marketing functions

Table 36: Cost of marketing functions

SI No	Actors	Marketing functions	Cost (Rs. Per box of 7 kg)
1	Producer	Transportation	5
2	Collection agent	Grading & Packing Loading and unloading + Transportation	20 5
3	Wholesaler	Transportation Loading & unloading	20
4	Distributor	Transportation Loading & unloading	10
5	Retailer	Loading & unloading Unpacking and arrangement	10
6	Processor	Value addition (pulp, juice, *etc.*)	25

In most cases the producers incur only transportation cost as a part of marketing function, this was also evident from Table 27. The collection agents were the ones who incurred the highest marketing cost because they were carrying out marketing functions such as grading, packing, loading and unloading and transportation. The processor had to incur cost of cleaning, processing treatments and value addition.

4.4.4. Price spread, marketing cost and marketing margin

Table 37: Price spread, marketing cost and marketing margin of the different marketing channels

	Channel					
	1	**2**	**3**	**4**	**5**	**6**
Producer's price	100	100	60	120	30	30
Total marketing cost	65	155	60	40	20	55
Total marketing margin	535	445	380	340	20	35
Consumer's price	700	700	500	500	70	130
Price spread	600 (85.71)	600 (85.71)	440 (88.00)	380 (76.00)	40 (57.14)	100 (76.92)
Producer's share in consumer's rupee (%)	14.29	14.29	12	24	42.86	23.08

Note: Figures in parenthesis indicate the price spread expressed as per cent of the respective consumer prices

It is clear from Table 37 that though the producer's share in consumer's rupee was high for channel 5, it is not advisable for the farmers to market majority of their produce through this channel as the producers receive only meagre price for a box of 7 kg. It was also observed that the producer's share in consumer's rupee was comparatively high in channel 4 and this could be attributed due to the elimination of collection agent in the channel as the producer himself undertook the marketing functions such as grading, packing, *etc.*

4.4.5. Volume of mango channelized through the different marketing channels

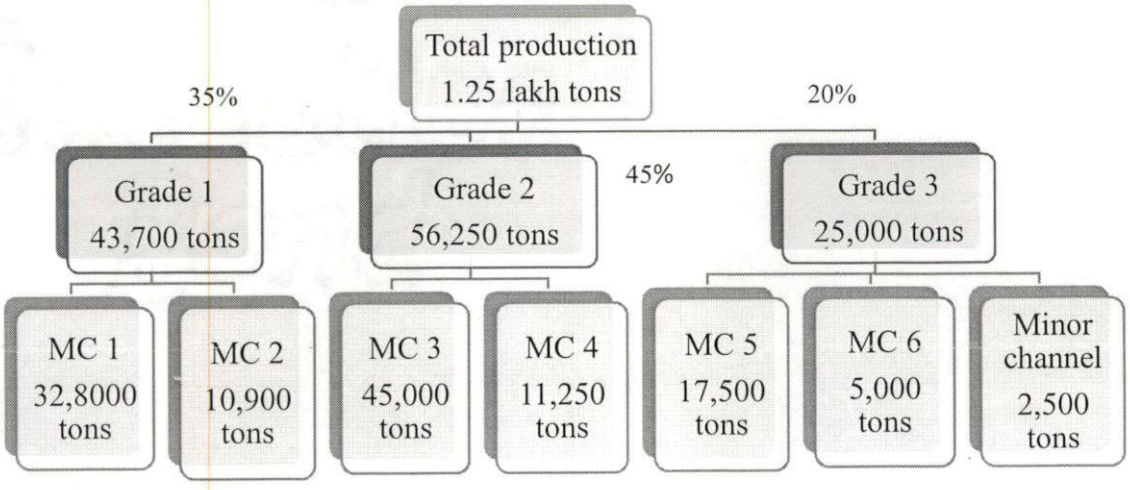


Fig. 8: Physical flow of mangoes from Muthalamada during 2015- 16

Fig. 8 shows the physical flow of mangoes from Muthalamada during 2015-16 and the total mango production was approximately around 1.25 lakh tons, of which grade 2 constitute 45 per cent, grade 1 accounted 35 per cent, followed by grade 3 with 20 per cent respectively. The maximum amount of mangoes were channelized through marketing channel 3 (80 per cent of grade 2 mangoes) and marketing channel 1 (75 per cent of grade 1 mangoes).

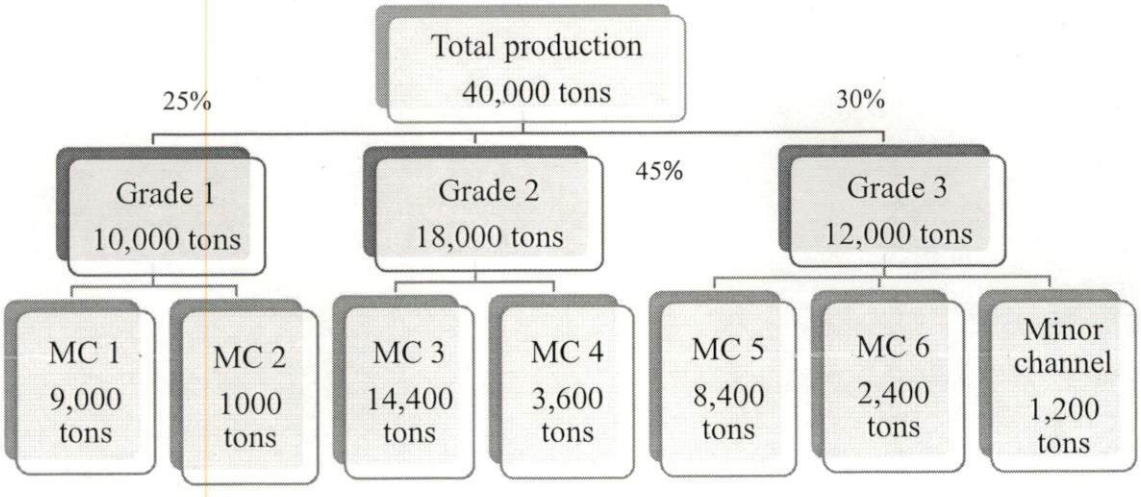


Fig. 9: Physical flow of mangoes from Muthalamada during 2016- '17

Fig. 9 shows the physical flow of mangoes from Muthalamada during 2016-17 and the total mango production was approximately around 40,000 tons, out of which grade 2 alone accounted 45 per cent, followed by grade 3 and grade 1 with 30 per cent and 25 per cent respectively. The maximum amount of mangoes were channelized through marketing channel 3 (80 per cent of grade 2 mangoes). The mangoes marketed through the marketing channel 1 was comparatively less with respect to the previous year.

4.4.5. Results of Binary Logistic Regression Statistics for marketing efficiency

Table 38: Factors affecting marketing efficiency

Effect	S.E.	Wald	df	Sig.
Age	1.617	.907	1	.341
Education	1.771	2.150	1	.143
Occupation	1.372	2.872	1	.090
Annual income	1.930	.025	1	.875
Total area	1.101	.006	1	.938
Mango area	1.162	1.177	1	.278
Experience	1.036	4.956	1	**.026***
Ownership	1.469	3.385	1	**.066****
Income sources	1.772	4.907	1	**.027***
Cultivation type	1.647	3.455	1	**.063****
Orchard type	1.884	3.442	1	**.064****
Production cost	2.642	1.952	1	.162
Market avenue	1.145	.413	1	.521
Credit	5.744	3.197	1	.074
Credit source	3.220	5.127	1	**.024***
Organizational membership	1.058	.220	1	.639
Marketing channel	3.124	5.510	1	**.019***
Marketing function	.800	1.834	1	.176
Grades	.882	1.753	1	.185
Extension contact	.447	2.271	1	.132
Note: *Significance level at 5%		**Significance level at 10%		

The result of the binary logistic regression showed the significant influence of the variables viz., experience, ownership of land, cultivation type, orchard type, income sources, credit source and marketing channel on marketing efficiency. The extent of influence of these variables on marketing efficiency was determined from the odds ratio.

4.4.5.1. Odds ratio and percent probability related to marketing efficiency

Table 39: Odds ratio and percent probability

Variables	Odds ratio	Probability percentage
Experience	2.307	69.76
Ownership	2.703	72.99
Cultivation type	3.062	75.38
Orchard type	3.495	77.75
Income sources	3.926	79.70
Credit source	7.290	87.94
Marketing channel	7.333	88.00

From Table 39 it could be inferred that the marketing efficiency could be further improved to extent of 69.76 per cent by acquiring more experience.

Scoring procedure was arranged from 1 to 3 respective for owned, leased and both owned + leased land. The result revealed that the farmer who has purely owned land had relatively least area under mango cultivation when compared to the farmers with both owned and leased area. The lessee farmers were more market oriented and

tended towards seeking of more market avenues. Subsequently, the results also revealed that when a farmer move from owned land to having more leased land, the marketing efficiency increases (72.99 per cent), it should also equate to the lease money they paid.

Income source of the respondent was significant at 5 per cent level of significance and it could be inferred that the marketing efficiency could be enhanced up to 79.70 per cent with respect to the income sources of the farmers. This point out that the farmers with more income sources were highly innovative and their entrepreneurial behavior and achievement motivation were also high.

Cultivation type of the respondents had significant influence on the marketing efficiency. The marketing efficiency could be further improvised to the extent of 75.38 per cent as the farmer moved from organic farming to integrated practices, this shows the commercial interest of the farmer towards the mango sector. This was also evident from Table 26. Farmers doing commercial mango cultivation in a large area tends to prefer integrated practices to enhance the production.

In case of orchard type, the marketing efficiency could be improved up to 77.75 per cent as the farmers move from conventional orchards to a mixed type of orchard where both conventional planting and High Density Planting (HDP) or intercropping were followed. They practiced innovative techniques to enhance their profit and this could be the reason for high marketing efficiency.

Marketing efficiency could be enhanced up to 87.94 per cent by way of availing credits from institutional sources. When the producer avail credit from non-institutional source (traders and pawn brokers), they will come into an agreement

wherein the farmer will sell his produce directly to the trader. This hinders the farmer from choosing other marketing channel, thereby affecting the marketing efficiency.

Marketing channel undoubtedly influence the marketing efficiency at 5 per cent level of significance. The marketing efficiency could be increased to about 88 per cent, if the farmer choose a marketing channel with less number of intermediaries.

4.4.6. Results of Mann Whitney U test

The respondents were categorized into two groups, group I and group II based on the area owned. Group I comprised of the respondents having less than 5 acres of land area and group II comprised of respondents possessing more than 5 acres. Mann Whitney U test was carried out to find the difference in attributes between the two groups. The result obtained was as follows:

Table 40: Comparison of two groups using Mann Whitney U test

Variables	Mean rank		U	Sig
	Group I	Group II		
Annual income	23.42	37.58	237.50	0.001*
Total area	15.50	45.50	0	.000*
Mango area	21.42	39.58	177.50	.000*
Cultivation type	27	34	345.00	0.065#
Production cost	24.97	36.03	284.00	0.002*
*Significance at 1% level, #Significance at 10% level				

Table 40 shows that five variables were significant at five per cent and ten per cent levels which points towards some variation among the two groups. These variables were annual income, total area, area under mango, cultivation type and production cost.

Annual income and production cost of the respondents were significantly different for the two groups, which was clearly evident from Table 27 that, with increase in area there was hike in the annual income of the respondent and reduction in the production cost. Since the demarcation of the groups were based on area owned, total area and area under mango will undoubtedly be contrasting for the two groups.

The cultivation type was the key discriminating factor, wherein with increase in area farmers tend to change the type of cultivation. It may be due to the simple fact that the farmers found it more economical to carry out combination of organic and inorganic type of cultivation for a large area. This scenario was evident during the field survey, where the farmers having large area maintained a portion of their orchard under organic cultivation.

4.4.7. Perception of the stakeholders

The measurement of the perception of stakeholders about the enhancement of the value chain through farmer inclusiveness showed that these percepts were strong in the farmers.

- The absence of a common collection center was the main reason for unfair pricing.
- Muthalamada mangoes are competent as it captures the early market.
- Lack of transparent market system is the primary cause for unavailability of market information in mango.

- Inability of the FPOs show in promoting marketing activities is the main reason for the farmers to remain in the claws of the profit extracting intermediaries.

The following percepts manifested poorly among the stakeholders.

- Awareness about the quality consciousness of the present day. consumers
- Need for taking up other marketing functions to get a better profit.

4.5 Constraints faced by the farmers

The farmers faced several problems during mango cultivation. The constraints were listed out in the interview schedule and the respondents were asked to rank it during the survey. Using Garret ranking technique, the ranks were then converted into mean score to identify the major constraints existing in the mango sector of Muthalamada.

Table 41: Constraints faced by the farmers

Sl No	Constraints	Mean score	Rank
1	Over dominance of middle men	67.25	1
2	Difficulty in getting reasonable price	66.64	2
3	Dearth of enough collection center	65.28	3
4	Poor availability of market information	60.99	4
5	Improper post-harvest practices	44.90	5
6	Lack of government support	43.67	6
7	Deficit of timely labor	42.01	7

8	Dearth of local markets	36.75	8
9	Improper cultivation practices	26.63	9
10	Lack of coordination	26.53	10

The major constraints identified were over dominance of middlemen in the marketing channel, difficulty in getting reasonable price for the produce, dearth of enough common collection center, poor availability of market information and improper post-harvest practices. John (2014) and Varghese (2014) also identified similar marketing constraints among jackfruit farmers.

Plate 3: Group discussion conducted with stakeholders

4.6 Strategic options

To arrive at strategic options SWOC analysis and scenario analysis were carried out and the strategic options were derived from the results obtained from SWOC matrix analysis, scenario analysis and constrain analysis.

4.6.1. Scenario analysis

Table 42: Trends and drivers in mango value chain

Trends	Drivers
1. Quality consciousness 2. Farmers organization 3. High Density Planting 4. Allied industries 5. Mechanization 6. Involvement of women and youth 7. Off season production 8. Large number of market 9. Processing improvement 10. Branding 11. Utilizing large quantities of chemicals 12. High cost of labor 13. Involvement of intermediaries	1. Commercialization 2. Price fluctuation 3. Labor shortage 4. Consumer preference 5. Government policies 6. Export opportunities 7. Increase in cost of production 8. Technical support 9. Change in technology

Table 42 shows the thirteen trends seen in the mango sector in Muthalamada along with nine drivers to predict the possible future for this sector.

Table 43: Scenario analysis

Trends	Uncertainty	Importance	Total
Quality consciousness	13	4	17
Farmers organization	10	5	15
High Density Planting	11	3	14
Allied industries	8	8	16
Mechanization	9	6	15
Involvement of women and youth	7	9	16
Early and regular bearing	**1**	**7**	**8**
Large number of market	**2**	**1**	**3**
Processing improvement	12	2	14
Branding	6	12	18
Utilizing large quantities of chemicals	3	11	14
High cost of labor	5	13	18
Involvement of intermediaries	4	10	14

Table 43 shows the scenario analysis, wherein the trends are given ranks based on uncertainty and importance. Through uncertainty- importance ranking, final score was obtained for each of the trends. The trends with least uncertainty and comparatively high importance ranking, i.e. early and regular bearing and large number of markets were selected for deriving future by plotting in a graph

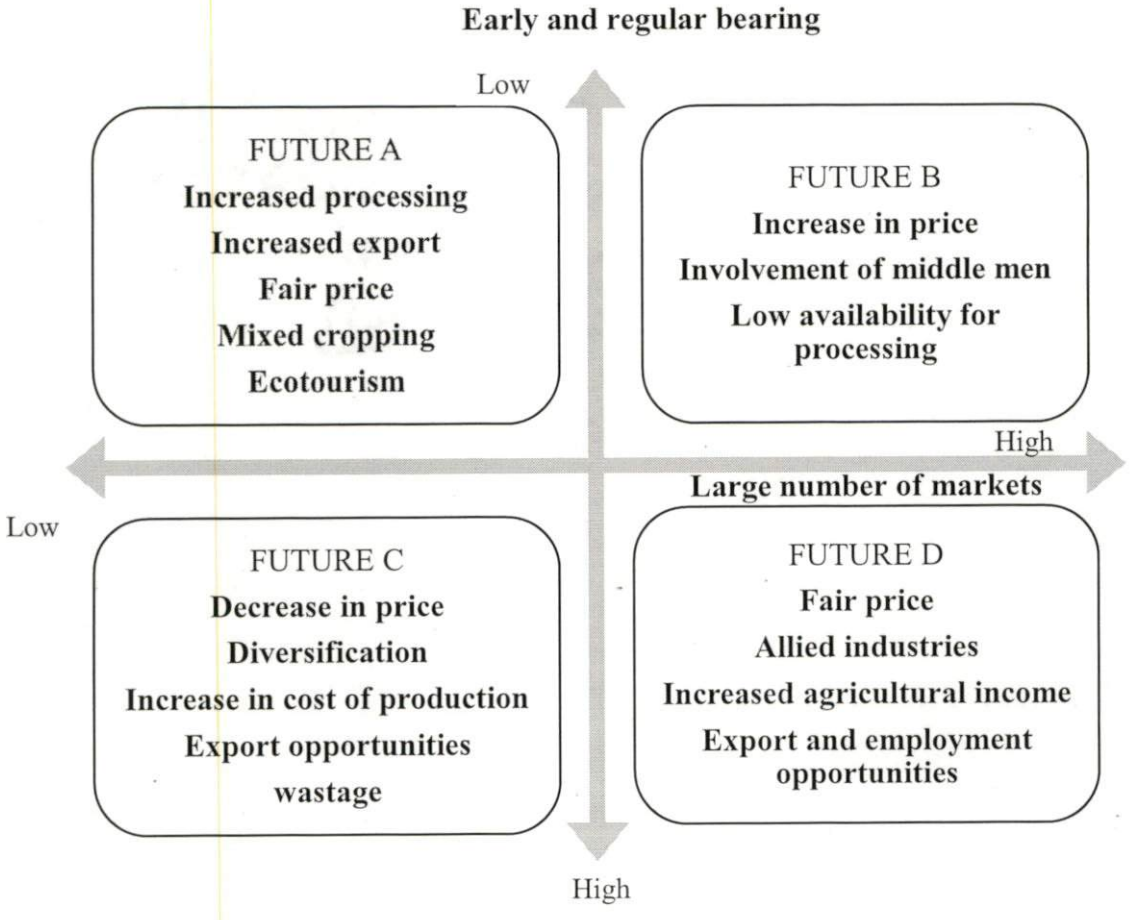


Fig. 10: Four futures of scenario analysis

Fig. 6 shows the futures derived from scenario analysis and it was noticed that FUTURE D was the most ideal future which provide fair price for the commodity, establishment of allied industries, increased agricultural income, more export and employment opportunities.

Whereas FUTURE A was the most likely future with increased processing, enhanced export, fair price for the commodity through processing and export, following mixed cropping and encouraging ecotourism.

4.6.2. SWOC analysis

Strengths (internal positive factors)	**Weakness (internal negative factors)**
1. Large area under cultivation 2. Commercialization 3. Long term investment 4. High density planting 5. Diversity in mango varieties 6. Availability of technical support 7. Capture early market	1. Labor shortage 2. High cost of labor 3. High input usage 4. Perishability 5. Lack of infrastructure facility 6. Ignorance of the farmers 7. Harvesting loss 8. Lack of funding 9. Improper management practices
Opportunities (external positive factors)	**Challenges (external negative factors)**
1. Export potential 2. Processing demand 3. Large scale market demand 4. Related industries 5. Job opportunities 6. Large number of markets 7. Branding of the produce 8. Involvement of women and youth 9. Ecological benefits 10. Investment from MNCs	1.Unexpected change in climatic condition 2.Lack of market information 3.Price fluctuation 4.Incidence of pest and diseases 5.Change in consumer preference 6.Political intervention 7.Lack of policies for mango sector 8.Lack of research

By subtracting the subtotal of positive statement (ST1) from the subtotal of negative statement (ST2), strategic options were obtained and the strategic options having the highest value were selected as the best strategic options.

The following were the strategic options derived from SWOC analysis and scenario analysis:

1. Enhancing value addition and product development (15)
2. To promote branding of the produce (13)
3. To educate the farmers on building competitiveness (10)
4. To increase export potential by addressing quality parameters (7)

These strategic options address the constraints faced the farmers and contribute to scenario in FUTURE A of scenario analysis. Similar suggestions were given by Mannambeth *et al.* (2015) and Vignesh and Santhiya (2014).

Table 44: SWOC matrix analysis

	To increase export potential	To expand the domestic market	To promote investment by MNCs and NRIs	To promote branding of the produce	Enhancing value addition and product development	To establish labor banks	To address perishability by promoting storage and transportation	To educate the farmers on building competitiveness
Large area under cultivation	5	5	4	3	2	2	2	2
Commercialization	5	4	5	5	4	3	2	4
Long term investment	4	3	5	4	4	3	3	3
High density planting	4	2	2	2	4	1	2	5
Diversity in mango varieties	4	3	3	4	5	1	4	4
Availability of technical support	5	3	2	4	5	3	5	5
Capture early market	2	3	4	5	3	2	4	4
ST1	29	23	25	27	27	15	22	27

	To increase export potential	To expand the domestic market	To promote investment by MNCs and NRIs	To promote branding of the produce	Enhancing value addition and product development	To establish labor banks	To address perishability by promoting storage and transportation	To educate the farmers on building competitiveness
Unexpected change in climate	5	4	2	1	1	1	4	1
Lack of market information	5	5	2	2	2	1	1	4
Price fluctuation	4	5	3	4	3	1	4	4
Lack of funding	3	3	5	3	3	2	2	3
Political intervention	2	3	3	2	1	2	1	1
Lack of research and policies	3	3	3	2	2	1	4	4
ST2	22	23	18	14	12	8	16	17
Balance (ST1-ST2)	**7**	0	7	**13**	**15**	7	6	**10**

SUMMARY AND CONCLUSION

CHAPTER V
SUMMARY AND CONCLUSION

Mango is a crop that is being cultivated over a substantial area in Palakkad District, and is being exported to a number of countries other than being sold in the domestic markets. Being a perennial crop that requires minimum care, farmers stick on to this crop and area under mango is actually on the rise in this major mango growing tract of Kerala. However, the sector is not devoid of any problems. There are a large number of farmers growing mango. Marketing, generally, is not very efficient for the farmers. A series of actors are involved in the value chain before the commodity is graded and exported. Improper plant protection measures adopted, largely due to ignorance, is another factor that might lead to poor marketability and quality of produce.

Being one of the few substantial agricultural commodity value chains existing in Kerala, which provides hope for the farmers, the mango value chain of Palakkad district needs urgent attention to improve its performance. With the apprehensions regarding pesticide residue dangers being rife in the minds of the public, it is immediately necessary that the primary producers be made aware of this.

This study aims to come up with suggestions to improve the prospects of the mango growing farmers after doing a value chain analysis. The objectives of the study were;

1. To identify the stakeholders in mango value chains, their functions and value share.
2. To analyze the institutions and institutional roles in mango value chains.
3. To identify the marketing channels utilized by farmers.

4. To analyze the price spread and marketing efficiency of the farmers.
5. To understand the constraints faced by the farmers.
6. To arrive at suggestions for value chain enhancement in favor of producer farmers.

The Muthalamada Panchayat in Palakkad district was selected as the study area as it had the largest area under mango cultivation. From among the mango producers, 60 farmers were selected as the respondents using random sampling procedure, which will represent small, medium and large mango growers. About 30 respondents were also chosen separately representing other stakeholder groups in the value chain through random sampling and snowballing technique and their respective functions were identified.

The data collection was done using pre-tested structured interview schedule and direct observation and from secondary sources of information.

Stakeholder analysis, scenario analysis and SWOC matrix analysis were done based on inputs obtained from the survey and interviews and strategic options were formulated. Price spread analysis and measures of marketing efficiency was calculated using Acharya's approach and the efficiency in marketing by the farmers was analyzed.

Binary logistic regression was used to identify the major socio-economic factors affecting marketing efficiency. Mann Whitney U test was used to compare the two groups of respondent farmers.

Statistical Package for Social Sciences (SPSS version 20) was used to tabulate, analyze and interpret the data. The statistical tests used for the analysis and interpretation of data included; percentage analysis, cross tabulation, frequency, Binary logistic regression and Mann Whitney U test.

The salient findings of the study were;

- Majority of the respondents with age in between 51 and 70 years depended on agriculture alone (64.70 per cent).

- They marketed more than 75 per cent of their produce to distant markets such as Delhi, Mumbai, Ahmedabad, *etc.*

- The respondents had good educational status with experience more than 20 years and medium extension contact.

- The farmers cultivating in leased land along with their own orchard (78.26 per cent) tend to go for combined cultivation practices.

- Two third of the respondents (68.62 per cent) relied on collection agent for marketing their produce.

- The mango growers were well organized, with about 51 respondents (49 per cent) having membership in Farmer Producer Organization (FPO).

- Alphonso, Benganpally, Bennett Alphonso and Tottapuri are mainly preferred for cultivation.

- Stakeholder analysis revealed that intermediaries like mandi walas, trader and collection agent over dominated the value chain.

- The major institutions involved in mango value chain include Krishi Bhavan, State Horticulture Mission (SHM), APEDA, FPOs, Chittur Agro Park and NABARD.

- The marketing channel utilized by the farmers varies according to the grade of the produce, grade 1 is the export quality, grade 2 is usually the undersized mangoes that does not fulfil the export requirement and grade 3 is malformed mangoes or mangoes having external discoloration, *etc.*

- In case of grade 1 mangoes both channel 1 and channel 2 were having marketing efficiency 0.14. Margin was highest for the wholesaler and the exporting agency for channel 1 and channel 2 respectively.

- For grade 2 mangoes, channel 4 was found to be more efficient (0.24) due to absence of an intermediary.

- Grade 3 mangoes, channel 5 was found to be efficient (0.4) whereas in case of channel 6 involvement of too many intermediaries affects the efficiency.

- The important factors affecting marketing efficiency according to binary logistic regression include experience, ownership, income source, type of cultivation, orchard type, credit source and marketing channel.

- A comparative study made among two groups of farmers revealed that cultivation type was significantly different for the respondents of these two groups.

- Major constraints faced by the farmers during marketing include over dominance of middle men, difficulty in getting reasonable price, dearth of enough collection centres and poor availability of market information.

- The strategic options developed from the study are enhancing value addition and product development, promotion of branding of the produce, to educate the farmers on building competitiveness and to increase export potential by addressing quality parameters.

In conclusion, among the different marketing channels identified the channel involving collection agent, wholesaler, distributor and retailer other than the producer famer and end user, was found to carry the bulk volume of mango transacted. This channel carried almost 75 per cent of the produce during the study year. The channel that benefited the producer farmer the most was Channel 4 because it earned them the highest marketing margin (21.84 per cent). The reason for this is seen as the producer farmer playing another marketing function too in this channel, as collection agent. Marketing efficiency was the highest in Channel 5, which is attributed to few number of marketing functions and hence lower marketing cost. However the net profit obtained to the producer farmer in this channel is very less, as the marketing margin in this channel is very less due to the inferior quality of the produce.

Thus, the mango sector seems to hold promise if the producer farmer becomes market oriented and improve the quality of the produce through proper post-harvest handling. Channelizing the produce to new domestic markets would benefit the small holder farmers. Increasing health consciousness among the public, escalating consumption of fruits in regular diet and widening product diversification opportunities, offers hope for the mango producers and point towards a brighter future for this nutritious, delicious and easily grown fruit.

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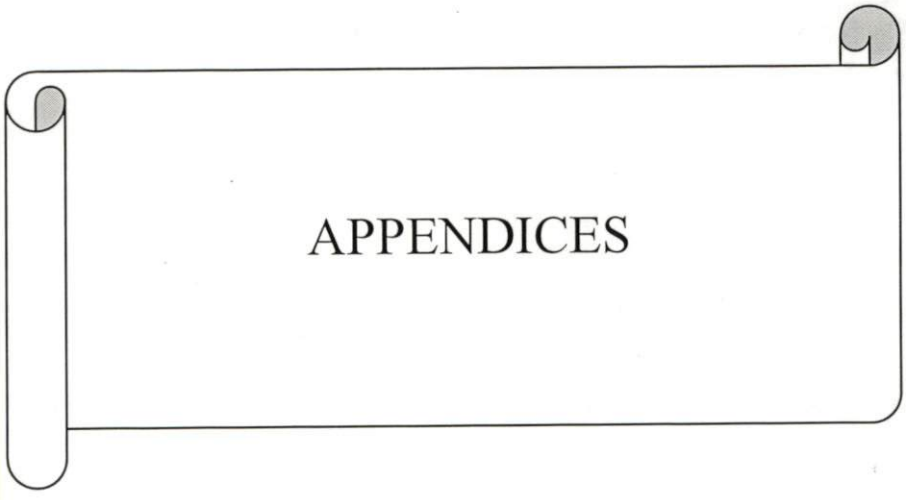

APPENDICES

APPENDIX I: INTERVIEW SCHEDULE FOR THE STAKEHOLDERS

കേരള കാർഷിക സർവകലാശാല
കോളേജ് ഓഫ് ഹോർട്ടികൾച്ചർ
വിജ്ഞാന വ്യാപന വിഭാഗം

Stakeholder analysis for enhancing the role of primary producers in mango value chains

1. പേര്:
2. വിലാസം:
3. മൊബൈൽ നമ്പർ:
4. വയസ്:

☐ < 30 ☐ 30 - 50 ☐ 51 - 70 ☐ >70

5. വിദ്യാഭ്യാസം:

☐ പ്രാഥമികം ☐ ഹൈ സ്കൂൾ ☐ പ്ലസ് ടു ☐ ബിരുദം
☐ ബിരുദാനന്തരബിരുദം

6. വരുമാനമേഖല (*ഈ ചോദ്യത്തിന് ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ തിരഞ്ഞെടുക്കാം*):

☐ കൃഷി ☐ വ്യാപാരം
☐ ഗവൺമെൻറ് ഉദ്യോഗം ☐ റിട്ടയേർഡ്

7. വാര്‍ഷികവരുമാനം (ഏക്കറിന്): ☐ 25,000 ത്തിൽ താഴെ
☐ 25,000 - 50,000
☐ 50,000 - 1 ലക്ഷം
☐ 1 ലക്ഷത്തിന് മുകളിൽ

8. മൊത്തം കൃഷി സ്ഥലം (ഏക്കറിന്):

9. എത്ര സ്ഥലത്താണ് മാങ്ങ കൃഷി ചെയ്യുന്നത്?

☐ < 2 ഏക്കർ ☐ 2 -5 ഏക്കർ ☐ 5 - 10 ഏക്കർ
☐ 10 - 25 ഏക്കർ ☐ 25- 50 ഏക്കർ ☐ > 50 ഏക്കർ

10. എത്ര വർഷമായി മാങ്ങ കൃഷി ചെയ്യുന്നു?

11. മറ്റേതെല്ലാം കൃഷികളുണ്ട്?

12. സ്ഥലത്തിന്റെ ഉടമസ്ഥാവകാശം:
☐ സ്വന്തം ☐ പാട്ടത്തിന് ☐ രണ്ടും ചേര്‍ന്നത്

13. ഉത്പാദന ചെലവ്:

വിശേഷണം	ചെലവ്
സ്ഥാപിത ഘട്ടം	
നിലം ഒരുക്കൽ	
തൈകൾ	
വളമിടൽ	
അഗ്രോകെമിക്കൽസ്	
കൃഷി ഉപകരണങ്ങൾ	
തൊഴിലാളി	

ആദ്യത്തെ വിളവെടുപ്പ് വരെയുള്ള വർഷങ്ങളിൽ	
വളമിടൽ	
അഗ്രോകെമിക്കൽസ്	
കള നിയന്ത്രണം	
വിളവെടുപ്പ്	
ഗതാഗതം	
തരംതിരിക്കൽ	
പായ്ക്കിംഗ്	
തൊഴിലാളി	

14. കുടുംബാംഗങ്ങളുടെ തൊഴിൽ വിവരം:

അംഗം	തൊഴിൽ
കുടുംബനാഥൻ	ജോലി/ കൃഷി / റിട്ടയേർഡ് / ബിസിനസ് (സ്വയം തൊഴിൽ) / വിദ്യാർത്ഥി / മറ്റുള്ളവ
കുടുംബനാഥ	ജോലി/ കൃഷി / റിട്ടയേർഡ് / ബിസിനസ് (സ്വയം തൊഴിൽ) / വിദ്യാർത്ഥി / മറ്റുള്ളവ
മകൻ/ മകൾ	ജോലി/ കൃഷി / റിട്ടയേർഡ് / ബിസിനസ് (സ്വയം തൊഴിൽ) / വിദ്യാർത്ഥി / മറ്റുള്ളവ
മകൻ/ മകൾ	ജോലി/ കൃഷി / റിട്ടയേർഡ് / ബിസിനസ് (സ്വയം തൊഴിൽ) / വിദ്യാർത്ഥി / മറ്റുള്ളവ
അച്ഛൻ/ അമ്മ	ജോലി/ കൃഷി / റിട്ടയേർഡ് / ബിസിനസ് (സ്വയം തൊഴിൽ) / വിദ്യാർത്ഥി / മറ്റുള്ളവ

സഹോദരൻ/ സഹോദരി	ജോലി/ കൃഷി / റിട്ടയേർഡ് / ബിസിനസ് (സ്വയം തൊഴിൽ) / വിദ്യാർത്ഥി / മറ്റുള്ളവ
മറ്റുള്ളവർ	ജോലി/ കൃഷി / റിട്ടയേർഡ് / ബിസിനസ് (സ്വയം തൊഴിൽ) / വിദ്യാർത്ഥി / മറ്റുള്ളവ

15. ഏതൊക്കെ ഇനങ്ങളാണ് കൃഷി ചെയ്യുന്നത്?

ഇനങ്ങൾ	മരത്തിന്റെ എണ്ണം	വിസ്തീർണം (ഏകദേശം)	പ്രായം
അൽഫോൻസോ			
ബംഗനപ്പള്ളി			
സിന്ദൂരം			
തോട്ടപുരി			
മറ്റുള്ളവ 1. 2. 3. 4. 5.			

16. ഏതു തരം വളപ്രയോഗമാണ് ഉപയോഗിക്കുന്നത്?

☐ ജൈവവളം ☐ രാസവളം ☐ രണ്ടും കൂടി

17. ഏതു തരം കൃഷി രീതിയാണ് ഉപയോഗിക്കുന്നത്?

☐ സാധാരണ രീതി ☐ ഹൈ ഡെൻസിറ്റി ☐ രണ്ടും

18. ഓരോ ഇനത്തിന്റെയും ശരാശരി വിളവ്:

ഇനങ്ങൾ	വിളവ് (ഒരു മരത്തിൽ നിന്നും)
അൽഫോൻസോ	
ബംഗനപ്പള്ളി	
സിന്ദൂരം	
തോട്ടപുരി	
മറ്റുള്ളവ 1. 2. 3. 4. 5.	

19. ഏതെങ്കിലും സംഘടനയിൽ അംഗത്വം ഉണ്ടോ (*ഈ ചോദ്യത്തിന് ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ തിരഞ്ഞെടുക്കാം*)?

- ☐ ഫാർമാർ പ്രൊഡ്യൂസർ കമ്പനി
- ☐ കോ ഓപ്പറേറ്റീവ് സൊസൈറ്റി
- ☐ പെൻഷണേഴ്സ് ക്ലബ്
- ☐ കലാസാംസ്കാരിക സംഘടന
- ☐ മറ്റുള്ളവ
- ☐ അംഗത്വമില്ല

20. എങ്ങനെയാണ് താങ്കൾ ഉത്പന്നങ്ങൾ വിൽക്കുന്നത് (*ഈ ചോദ്യത്തിന് ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ തിരഞ്ഞെടുക്കാം*)?

- ☐ തോട്ടത്തിൽ കരാറുകാരൻ വന്നു എടുക്കുന്നു
- ☐ സ്വന്തമായി കാരാറുകാരന് എത്തിക്കുന്നു
- ☐ സ്ഥലത്തെ മൊത്ത വ്യാപാരിക്ക് കൊടുക്കുന്നു
- ☐ സ്ഥലത്തെ ചില്ലറ വ്യാപാരിക്ക് കൊടുക്കുന്നു
- ☐ കുറച്ച് ഉപഭോക്താക്കൾ നേരിട്ടു വന്നു വാങ്ങുന്നു
- ☐ മാങ്ങ സംഭരണ കേന്ദ്രത്തിൽ (ഷെഡ് ഉടമ) കൊടുക്കുന്നു
- ☐ മറ്റേതെങ്കിലും രീതി (എഴുതുക)

21. ചെലവുകൾ:

a) കയറ്റലും ഇറക്കലും:

b) തരംതിരിക്കൽ:

c) പായ്ക്കിംഗ്:

d) ഗതാഗതം:

e) മറ്റുള്ളവ:

22. എത്ര ശതമാനം മാങ്ങയാണ് വില്പന ചെയ്യുന്നത്?

a) ലോക്കൽ മാർക്കറ്റ്:

b) വടക്കേന്ത്യൻ വിപണി:

c) കയറ്റുമതി:

d) മറ്റുള്ളവ:

23. ഗ്രേഡ് ചെയ്ത മാങ്ങകളുടെ ശതമാനം

a) 1st ക്വാളിറ്റി :

b) 2nd ക്വാളിറ്റി :

c) 3rd ക്വാളിറ്റി :

24. താങ്കൾ കാർഷിക ആവശ്യത്തിനായി ഏതെങ്കിലും വായ്പ സ്വീകരിച്ചിട്ടുണ്ടോ?

☐ ഉണ്ട് ☐ ഇല്ല

ഉണ്ടെങ്കിൽ എവിടെനിന്ന് *(ഈ ചോദ്യത്തിന് ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ തിരഞ്ഞെടുക്കാം)*?

☐ ബാങ്ക്

☐ സ്വകാര്യ ധനകാര്യ സ്ഥാപനങ്ങൾ

☐ സേട്ടു

☐ ബന്ധുക്കൾ/ സുഹൃത്തുക്കൾ

☐ മറ്റുള്ളവർ

25. കാർഷിക വിവരങ്ങൾക്കും സേവനങ്ങളും നൽകുന്ന ഏജൻസികളുമായുള്ള ബന്ധം:

ഏജൻസി	ഇല്ല	അപൂർവമായി	ഇടയ്ക്ക്	കൂടെക്കൂടെ	എപ്പോഴും
കൃഷി ഭവൻ					
കാർഷിക സർവകലാശാല					
സ്റ്റേറ്റ് ഹോർട്ടികൾച്ചർ മിഷൻ					
സ്വകാര്യ ഏജൻസി					
രാസവള/ കീടനാശിനി ഏജന്റ്					

26. കർഷകരെ മൂല്യശൃംഖലയിൽ ഉൾപെടുത്തുന്നതിനോടുള്ള അവബോധം:

SI. NO	വിവരണം	SA	A	N	D	SD
1	കർഷകർക്ക് വിപണി വിവരങ്ങൾ ലഭിക്കുന്നില്ല					

2	കർഷക കൂട്ടായ്മ ഒരു പരിധി വരെ കർഷകരുടെ താല്പര്യങ്ങൾ പരിഗണിച്ച് അവരെ മുന്നേറാൻ സഹായിക്കുന്നു					
3	മുന്തിയ ഇനം മാങ്ങകൾ കർഷകർക്ക് അധിക വരുമാനം ഉറപ്പുവരുത്തുന്നു					
4	കർഷകർക്ക് കൃഷി കൂടാതെ മൂല്യ ശൃംഖലയിലെ മറ്റ് പ്രവർത്തനങ്ങളിൽ ഏർപ്പെടാനുള്ള അവസരം ഉണ്ടാക്കണം					
5	ഉത്പനങ്ങളുടെ വിപണന സാധ്യതകളെ കുറിച്ച് കർഷകർ വേണ്ടത്ര ബോധവാന്മരല്ല					
6	കർഷക കൂട്ടായിമയുടെ കീഴിൽ സ്വയം വിപണന സാധ്യതകൾ പ്രയോജനപെടുത്താതെ കർഷകർ മധ്യവർത്തികളെ ആശ്രയിച്ചു് കിട്ടുന്ന വരുമാനത്തിൽ ഒതുങ്ങി കൂടുന്നു					
7	കീട-രോഗ നിയന്ത്രണ മാർഗങ്ങളെ കുറിച്ച് കൂടുതൽ ശ്രദ്ധചെലുത്താത്തത് ഉത്പന്നങ്ങളുടെ ഗുണനിലവാരത്തെ സാരമായി ബാധിക്കുന്നു					
8	സ്വദേശവിപണി ആശ്രയിച് മാത്രമാണ് കർഷകർ കൃഷിചെയ്യുന്നത് അതുകൊണ്ടുതന്നെ കയറ്റുമതിക്ക് ആവശ്യമായ ഗുണനിലവാരം ഉത്പന്നങ്ങളിൽ ഉറപ്പുവരുത്താൻ കർഷകർ പരാജയപ്പെടുന്നു					
9	കർഷകർക്ക് നേരിട്ട് സമീപിക്കാൻ കഴിയുന്ന വിധം ഒരു സംഭരണകേന്ദ്രത്തിന്റെ അഭാവം മധ്യവർത്തികളുടെ സ്വാധീനം വർധിപ്പിക്കുന്നു					

10	ഉത്പ്പാദനം കൂടിയ സാഹചര്യങ്ങളിൽ മൂല്യവർദ്ധന സംരംഭങ്ങൾ ഇല്ലാത്തത് കർഷകർക്ക് നഷ്ടമുണ്ടാക്കുന്നു					
11	മൂല്യശൃംഖലയിൽ കർഷകരുടെ സ്വാധീനം വർധിപ്പിക്കുന്നതിനായി രണ്ടു തട്ടുകളിലുള്ള ഇടനിലക്കാരെയെങ്കിലും ഒഴിവാക്കേണ്ടതാണ്					
12	പലപ്പോഴും കീടനാശിനി നിർമാതാക്കളും കച്ചവടക്കാരുമാണ് കർഷകർക്ക് വിള സംരക്ഷണത്തെ കുറിച്ച് നിർദേശങ്ങൾ നൽകുന്നത്					
13	മാമ്പഴക്കാലത്ത് ഏറ്റവും ആദ്യം വിപണനത്തിന് എത്തുന്നത് മുതലമടയിൽ നിന്നുള്ള മാങ്ങകളാണ്					
14	ഗുണനിലവാരമുള്ള ഉത്പന്നങ്ങളോടുള്ള ഉപഭോക്താവിന്റെ താല്പര്യം ഇതുവരെ പൂർണമായി പ്രയോജനപ്പെടുത്താൻ കർഷകർക്ക് സാധിച്ചിട്ടില്ല					
15	ഉപഭോക്താവിന് താൻ വാങ്ങുന്ന ഉത്പന്നത്തിന്റെ വിശ്വാസ്യത ഉറപ്പുവരുത്താനുള്ള ഒരു സംവിധാനവും ഇന്നും മുതലമട മാങ്ങയുടെ മൂല്യശൃംഖലയിൽ പ്രയോജനപ്പെടുത്തിയിട്ടില്ല					
16	ഉപഭോക്താക്കൾ ആരോഗ്യസംരക്ഷണത്തിന് കൂടുതൽ ശ്രദ്ധചെലുത്തുന്ന സാഹചര്യത്തിൽ മാമ്പഴം പോലുള്ള ധാതുവർദ്ധകമായ പഴവർഗങ്ങൾക്ക് പ്രാധാന്യം ഇനിയും ഒരുപാട് വർധിക്കും					

SA- പൂർണമായും യോജിക്കുന്നു A-യോജിക്കുന്നു N- പക്ഷപാതമില്ല

D- യോജിക്കുന്നില്ല SD- പൂർണമായും യോജിക്കുന്നില്ല

27. കർഷകർ നേരിടുന്ന പരിമിതികൾ:

	പരിമിതികൾ	സ്ഥാനം
1	വിപണി വിവരങ്ങളുടെ ലഭ്യതക്കുറവ്	
2	കച്ചവടക്കാരുടെ അമിതമായ ഇടപെടൽ	
3	ന്യായവില ഇല്ലാത്തത്	
4	വിളവെടുപ്പിനു ശേഷമുള്ള പ്രവർത്തനങ്ങളോടുള്ള ശ്രദ്ധക്കുറവ്	
5	സംഭരണകേന്ദ്രത്തിന്റെ കുറവ്	
6	ഒരു പൊതുശേഖരണ സംവിധാനത്തിന്റെ (കളക്ഷൻ സെന്റർ) അഭാവം	
7	കർഷകർ തമ്മിലുള്ള സഹകരണമില്ലായിമ	
8	തൊഴിലാളികളുടെ ലഭ്യത കുറവ്	
9	തദ്ദേശ വിപണിയുടെ അഭാവം	
10	സർക്കാർ സഹായം കൂടുതലായി ലഭിക്കാത്തത്	

APPENDIX II: INTRODUCTORY LETTER TO JUDGES FOR JUDGES RATING

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF HORTICULTURE

Department of Agricultural Extension

Dr. Jayasree Krishnankutty

Professor

Vellanikkara

11. 01. 2017

Dear Sir/Madam,

Attached with this is a list of statements to assess the perception of the stakeholders on farmer inclusiveness in mango value chain by my student, Nadhika. K, as a part of her thesis work. Her work entitled, 'Stakeholder analysis for enhancing the role of primary producers in mango value chains'.

I would like to request you to spare a little of your valuable time to go through them and rate them according to their relevance so as to formulate the final questionnaire. The objectives of the study are given overleaf.

Thanking you in advance

With best regards

Jayasree Krishnankutty

APPENDIX III: PERCEPTION STATEMENTS FOR STAKEHOLDERS-JUDGES RATING RESULTS

Sl. NO	വിവരണം	Total score	Percentage (%)
1	കൃഷി കൂടാതെ മറ്റു തൊഴിലുകൾ ചെയ്യുന്നതിനാൽ കൃഷിയിൽ കൂടുതൽ ശ്രദ്ധ ചെലുത്താൻ കർഷകർക്ക് സാധിക്കുന്നില്ല	69	57.5
2	കർഷകർക്ക് സ്വയം ഉത്പനങ്ങൾ വിൽക്കുവാൻ താല്പര്യമില്ല	72	60
3	കർഷകർക്ക് വിപണി വിവരങ്ങൾ ലഭിക്കുന്നില്ല	90	75
4	കർഷക കൂട്ടായ്മ ഒരു പരിധി വരെ കർഷകരുടെ താല്പര്യങ്ങൾ പരിഗണിച്ച് അവരെ മുന്നേറാൻ സഹായിക്കുന്നു	101	84.17
5	മുന്തിയ ഇനം മാങ്ങകൾ കർഷകർക്ക് അധിക വരുമാനം ഉറപ്പുവരുത്തുന്നു	93	77.50
6	മാങ്ങ കൃഷിയേക്കാൾ ലാഭം മാങ്ങ തോട്ടം പാട്ടത്തിന് കൊടുക്കുന്നതാണ്	84	70
7	കർഷകർക്ക് കൃഷി കൂടാതെ മൂല്യ ശൃംഖലയിലെ മറ്റ് പ്രവർത്തനങ്ങളിൽ ഏർപ്പെടാനുള്ള അവസരം ഉണ്ടാക്കണം	95	79.17
8	ഉത്പനങ്ങളുടെ വിപണന സാധ്യതകളെ കുറിച്ച് കർഷകർ വേണ്ടത്ര ബോധവാന്മരല്ല	93	77.50
9	കർഷക കൂട്ടായിമയുടെ കീഴിൽ സ്വയം വിപണന സാധ്യതകൾ പ്രയോജനപെടുത്താതെ കർഷകർ മധ്യവർത്തികളെ ആശ്രയിച്ചു കിട്ടുന്ന വരുമാനത്തിൽ ഒതുങ്ങി കൂടുന്നു	90	75

10	കർഷകരും ഉപഭോക്താക്കളും തമ്മിൽ ഒരു ബന്ധം തന്നെ ഇപ്പോൾ നിലനിൽക്കുന്നില്ല	85	70.83
11	കാലാവസ്ഥ വ്യതിയാനം മൂലം കർഷകർ ധാന്യവിളകളിൽ നിന്നും നാണ്യവിളയിലോട്ടു മാറുന്നു ഇതാണ് ധാന്യവിളകളുടെ ഉത്പ്പാദനം കുറയാനുള്ള കാരണം	82	68.33
12	മാങ്ങാകൃഷിയോടുള്ള കർഷകരുടെ സമീപനം കുടുതലും വ്യാപാരടിസ്ഥാനത്തിലായതിനാൽ വിളയുടെയോ ഉത്പന്നത്തിന്റെയോ ഗുണനിലവാരത്തിൽ പലപ്പോഴും കർഷകർ ശ്രദ്ധിക്കാറില്ല	82	68.33
13	കീട-രോഗ നിയന്ത്രണ മാർഗങ്ങളെ കുറിച്ച് കൂടുതൽ ശ്രദ്ധചെലുത്താത്തത് ഉത്പന്നങ്ങളുടെ ഗുണനിലവാരത്തെ സാരമായി ബാധിക്കുന്നു	87	72.50
14	സ്വദേശവിപണി ആശ്രയിച്ച് മാത്രമാണ് കർഷകർ കൃഷിചെയ്യുന്നത് അതുകൊണ്ടുതന്നെ കയറ്റുമതിക്ക് ആവശ്യമായ ഗുണനിലവാരം ഉത്പന്നങ്ങളിൽ ഉറപ്പുവരുത്താൻ കർഷകർ പരാജയപ്പെടുന്നു	90	75
15	അമിതമായ ഉത്പാദന പ്രവർത്തനങ്ങൾ കർഷകർക്ക് പലതരത്തിലുള്ള ചിലവിന് വഴിയൊരുക്കുന്നു	68	56.67
16	കർഷകർക്ക് നേരിട്ട് സമീപിക്കാൻ കഴിയുന്ന വിധം ഒരു സംഭരണകേന്ദ്രത്തിന്റെ അഭാവം മധ്യവർത്തികളുടെ സ്വാധീനം വർധിപ്പിക്കുന്നു	98	81.67
17	ഉത്പ്പാദനം കൂടിയ സാഹചര്യങ്ങളിൽ മൂല്യവർദ്ധന സംരംഭങ്ങൾ ഇല്ലാത്തത് കർഷകർക്ക് നഷ്ടമുണ്ടാക്കുന്നു	101	84.17

18	ചിറ്റൂർ അഗ്രോ പാർക്ക് പോലെയുള്ള സംരംഭങ്ങൾ ഒരു പരിധി വരെ കർഷകരും ഉപഭോക്താവും തമ്മിലുള്ള അകലം കുറക്കാൻ സഹായിക്കും	83	69.17
19	നഴ്സറികളിലൂടെ ഗുണനിലവാരമുള്ള തൈകൾ ലഭിക്കാത്തത് കർഷകർ നേരിടുന്ന ഒരു പ്രധാന വെല്ലുവിളിയാണ്	86	71.67
20	ഹൈ ഡെന്സിറ്റി പ്ലാന്റിങ് പോലുള്ള കൃഷിരീതി പ്രയോജനപെടുത്തി കൃഷി ചെയ്യാൻ കർഷകർക്ക് താല്പര്യമില്ലത്തത് ഇത്തരം നൂതന സാങ്കേതികവിദ്യകൾക്ക് കർഷകരെ ആകർഷിക്കുന്നതിൽ പറ്റിയ വീഴ്ചയാണ് തെളിയിക്കുന്നത്	79	65.83
21	മൂല്യശൃംഖലയിൽ കർഷകരുടെ സ്വാധീനം വർധിപ്പിക്കുന്നതിനായി രണ്ടു തട്ടുകളിലുള്ള ഇടനിലക്കാരെയെങ്കിലും ഒഴിവാക്കേണ്ടതാണ്	94	78.33
22	രാഷ്ട്രീയ ഇടപെടലുകൾ മൂലം മാമ്പഴ വിപണനത്തോടനുബന്ധിച്ചുള്ള പല വികസന പ്രവർത്തനങ്ങളും അനിശ്ചിതത്വത്തിലാണ്	73	60.83
23	കൃഷി ഭവൻ മുഖേന നടത്തുന്ന മാങ്ങാകൃഷിയെ കുറിച്ചുള്ള പരിശീലന ക്ലാസ്സുകളിൽ പങ്കെടുക്കാൻ കർഷകർ താല്പര്യം കാണിക്കാറില്ല	61	50.83
24	തോട്ടം പാട്ടത്തിനെടുത്ത് കൃഷിചെയ്യുന്ന കർഷകന് വിപണിയിലെ ആവശ്യകതക്കനുസരിച്ച് ലാഭമോ നഷ്ടമോ ഉണ്ടായാലും ഭൂഉടമകൾക്ക് പാട്ടക്കരാറിൽ നിശ്ചയിച്ച തുക നൽകേണ്ടിവരും	78	65
25	പലപ്പോഴും കീടനാശിനി നിർമാതാക്കളും കച്ചവടക്കാരുമാണ് കർഷകർക്ക് വിള	99	82.50

	സംരക്ഷണത്തെ കുറിച്ച് നിർദേശങ്ങൾ നൽകുന്നത്		
26	മാമ്പഴക്കാലത്ത് ഏറ്റവും ആദ്യം വിപണനത്തിന് എത്തുന്നത് മുതലമടയിൽ നിന്നുള്ള മാങ്ങകളാണ്	89	74.17
27	ഗുണനിലവാരമുള്ള ഉത്പന്നങ്ങളോടുള്ള ഉപഭോക്താവിന്റെ താല്പര്യം ഇതുവരെ പൂർണമായി പ്രയോജനപ്പെടുത്താൻ കർഷകർക്ക് സാധിച്ചിട്ടില്ല	87	72.50
28	മുതലമട മാങ്ങക്ക് ഉപഭോക്താക്കളുടെ ഇടയിൽ ഒരു പ്രത്യേക അംഗീകാരം ഇതുവരെയും ഉണ്ടാക്കാൻ സാധിച്ചിട്ടില്ല	66	55
29	അമിത വില നൽകിയാണ് ഉപഭോക്താവ് പഴങ്ങൾ വാങ്ങുന്നത്	78	65
30	വിദേശ ഉപഭോക്താക്കളെ ആകർഷിക്കുന്ന വിധത്തിലുള്ള പ്രവർത്തനങ്ങളിൽ ഏർപ്പെടാൻ കർഷകർക്ക് ഇനിയും സാധിച്ചിട്ടില്ല	82	68.33
31	മറ്റു സംസ്ഥാനങ്ങളിൽ ആദ്യകാലങ്ങളിലുള്ള മാങ്ങയുടെ വിളവെടുപ്പ് മുതലമട മാങ്ങകൾക്ക് വെല്ലുവിളിയാവുന്നുണ്ട്	85	70.83
32	മുതലമടയിൽ അനേകം ഇനത്തിലുള്ള മാമ്പഴം ലഭ്യമാണെകിലും ഇവയിൽ രണ്ടോ മൂന്നോ ഇനങ്ങൾ മാത്രമാണ് ഉപഭോക്താക്കൾക്ക് ഏറെ പ്രിയം	78	65
33	തികച്ചും ജൈവമാർഗത്തിലും അല്ലാതെയും ഉത്പാദിപ്പിച്ച മാമ്പഴങ്ങൾക്ക് വിലയുടെ കാര്യത്തിൽ മാത്രം പ്രത്യേകിച്ച് വ്യത്യാസം കാണാൻ സാധിക്കില്ല	83	69.17

34	മുതലമടയിലെ മാമ്പഴം വടക്കേഇന്ത്യയിലെ വിപണികളെ ആശ്രയിച്ച് മാത്രമാണ് നിലനിൽക്കുന്നത്	63	52.50
35	ഉപഭോക്താവിന് താൻ വാങ്ങുന്ന ഉത്പന്നത്തിന്റെ വിശ്വാസ്യത ഉറപ്പുവരുത്താനുള്ള ഒരു സംവിധാനവും ഇന്നും മുതലമട മാങ്ങയുടെ മൂല്യശൃംഖലയിൽ പ്രയോജനപ്പെടുത്തിയിട്ടില്ല	89	74.17
36	ഉപഭോക്താക്കൾ ആരോഗ്യസംരക്ഷണത്തിന് കൂടുതൽ ശ്രദ്ധചെലുത്തുന്ന സാഹചര്യത്തിൽ മാമ്പഴം പോലുള്ള ധാതുവർദ്ധകമായ പഴവർഗങ്ങൾക്ക് പ്രാധാന്യം ഇനിയും ഒരുപാട് വർധിക്കും	100	83.33

STAKEHOLDER ANALYSIS FOR ENHANCING THE ROLE OF PRIMARY PRODUCERS IN MANGO VALUE CHAINS

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ABSTRACT OF THE THESIS

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Abstract

India is the largest mango producing and the chief exporting country in the world with an annual mango production of 18 million metric tons, which accounts for about 50 per cent of the global mango supply. In total India has about 8.97 lakh ha dedicated to mango farming, out of which Kerala accounts for about 77.30 thousand ha under mango cultivation during 2014-'15. Muthalamada in Chittur taluk of Palakkad district, is known as the 'Mango City' of Kerala. The mango orchards in Muthalamada covers around 4000 hectares, with about 5000 mango cultivators. The annual production of mango in Muthalamada Panchayat is approximately 40,000 tonnes. However, the mango sector in Palakkad district is not devoid of any problems, which hinders its economic advancement.

In this background, the present study entitled "Stakeholder analysis for enhancing the role of primary producers in mango value chain" was taken up in the Department of Agricultural Extension, College of Horticulture, Vellanikkara, during 2015-17. The study was formulated with the objectives to identify the stakeholders in mango value chains, their functions and value share, to analyze the institutions and its role in mango value chain, to identify the marketing channels utilized by the farmers, to examine the price spread and marketing efficiency of the farmers, to understand the constraints faced by the farmers and to suggest value chain enhancement measures in favor of producer farmers.

Survey was carried out among the mango growers and other stakeholders in Muthalamada Panchayat. About 60 farmers and 30 stakeholders were randomly selected for the study. Stakeholder analysis, SWOC matrix analysis and Scenario analysis were carried out through group discussions.

The results of the baseline information of the respondents revealed that the farmers with age in between 51 and 70 years depended on agriculture alone (64.70 per cent) and hence they were more cautious about marketing their produce. They marketed more than 75 per cent of their produce to distant markets such as Delhi, Mumbai, Ahmedabad, *etc*. The respondents had good educational status with experience of more than 20 years and medium extension contact. The farmers cultivating in leased land along with their own orchard (78.26 per cent) tend to go for combined cultivation practices.

Two third of the respondents (68.62 per cent) possessing different areas relied on collection agent for marketing their produce as they are easily approachable and the farmers had to incur only transportation cost. The mango growers were well organized, with about 51 respondents (49 per cent) having membership in Farmer Producer Organization (FPO). Alphonso, Banganpally, Bennett Alphonso and Tottapuri are mainly preferred for cultivation as these varieties are having huge demand in both international as well as domestic markets.

Stakeholder analysis according to importance- influence scoring revealed that intermediaries like mandi walas, trader, collection agent and pre-harvest contractor had more influence in the mango sector. The major institutions involved in mango value chain include Krishi Bhavan, State Horticulture Mission (SHM), APEDA (Agricultural and Processed Food Products Export Development Authority), FPOs (Farmer Producer Organizations), Chittur Agro Park and NABARD (National Bank for Agriculture and Rural Development). The marketing channel utilized by the farmers varies according to the grade of the produce, grade 1 is the export quality, grade 2 is usually the undersized mangoes that does not fulfil the export requirement and grade 3 is malformed mangoes or mangoes having external discoloration, *etc*.

In case of grade 1 mangoes both channel 1 and channel 2 were having marketing efficiency 0.14. Margin was highest for the wholesaler and the exporting agency for channel 1 and channel 2 respectively. For grade 2 mangoes, channel 4 was found to be more efficient (0.24) due to absence of an intermediary. Grade 3 mangoes are mainly sold at the local markets and for processing, wherein marketing of mangoes directly to local market was found to be efficient (0.4) whereas in case of processing involvement of too many intermediaries affects the efficiency of the marketing channel.

The important factors affecting marketing efficiency according to binary logistic regression include experience, ownership, income source, type of cultivation, orchard type, credit source and marketing channel. A comparative study was made among two groups of farmers, group I comprising of farmers with less than 5 acres of land and group II encompassing farmers with more than 5 acres. The result highlighted that, cultivation type was significantly different for the respondents of the two groups. Major constraints faced by the farmers during marketing include poor availability of market information, absence of a common collection center, over dominance of middle men and deficit of timely labor. Finally, SWOC analysis and scenario analysis were conducted to arrive at strategic options. The strategic options developed from the study are enhancing value addition and product development, promotion of branding of the produce, to educate the farmers on building competitiveness and to increase export potential by addressing quality parameters.