VALUE CHAIN ANALYSIS OF BANANA; NENDRAN VARIETY IN THRISSUR DISTRICT

By

Haritha Paul

(2017-15-001)

THESIS

Submitted in partial fulfillment of the requirement
For the degree of

Master of Science in Co-operation & Banking
(Rural Marketing Management)

Faculty of Agriculture

Kerala Agricultural University, Thrissur

Department of Rural Marketing Management
COLLEGE OF CO-OPERATION, BANKING AND MANAGEMENT
KERALA AGRICULTURAL UNIVERSITY
VELLANIKKARA, THRISSUR-680656
KERALA, INDIA

2019

DECLARATION

DECLARATION

I, hereby declare that the thesis entitled **"Value chain analysis of Banana; Nendran variety in Thrissur District"** is a bonafide record of research work done by me during the course of research and that the thesis 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.

Vellanikkara
09-08-2019

Haritha Paul

(2017-15-001)

CERTIFICATES

CERTIFICATE

Certified that this thesis entitled **"Value chain analysis of Banana; Nendran variety in Thrissur District"** is a record of research work done independently by **Miss. Haritha Paul (2017-15-001)** under my Guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to her.

Vellanikkara

09 - 08 - 2019

Dr. E.Vinaikumar
Professor and Head
Dept. of Co-operative Management.
College of Co-operation, Banking and Management.
Vellanikkara, Thrissur

CERTIFICATE

We, the undersigned members of the advisory committee of **Ms. Haritha Paul (2017-15-001)** a candidate for the degree of Master of Science in Co-operation & Banking with specialisation in Rural Marketing Management, agree that this entitled **"Value Chain Analysis of Banana; Nendran Variety in Thrissur District"** may be submitted by **Ms. Haritha Paul (2017-15-001),** in partial fulfillment of the requirement for the degree.

Dr. E.Vinaikumar
Professor and Head
Dept. of Co-operative Management.
College of Co-operation, Banking, and Management.
Vellanikkara, Thrissur
(Chairman)

Dr. K.N. Ushadevi
Professor and Head
Dept. of Rural Marketing Management
College of Co-operation, Banking and Management
Vellanikkara, Thrissur
(Member)

Dr. P. Shaheena
Professor and Head
Dept. of Development Economics
College of Co-operation, Banking and Management
Vellanikkara, Thrissur
(Member)

Dr.G.Veerakumaran
Professor
Dept. of Co-operative Management.
College of Co-operation, Banking, and Management.
Vellanikkara, Thrissur
(Member)

ACKNOWLEDGEMENT

ACKNOWLEDGEMENT

I humbly bow my head with infinite gratitude before the almighty god for all his blessings, all through my life and above all for the help extended to me through various known and unknown hands during the course of my Thesis work.

*This project report entitled "**VALUE CHAIN ANALYSIS OF BANANA; NENDRAN VARIETY IN THRISSUR DISTRICT**" is not the product of exclusively my efforts. For the completion of this work I received magnanimous support from many that, a comprehensive acknowledgement is almost impossible. Still I would like to reckon from my inner heart my deep gratitude and indebtedness to…*

*First of all I heartily felt condolences to **Dr. R. Sendilkumar,** Professor, Department of Co-operative Management, College of Co-operation, Banking and Management, KAU. He was a member in my advisory board. His guidance, support and encouragement which affected my entire thesis work.*

*I am highly obliged to **Dr. E. Vinaikumar** Professor and Head, Department of Co-operative Management, CCBM, and KAU my esteemed guide, without whose expert guidance, constant encouragement and sincere effort, this thesis would have remained a dream. No words in my vocabulary would suffice to express my heartfelt thanks and gratitude for his valuable advice, suggestions and encouragement throughout my academic career. His personal attention and consideration are also thankfully acknowledged here with. I feel greatly honoured by getting chance to work under her guidance.*

*I would especially thankful to **Dr. K.N. Ushadevi.**, Professor and Head, Department of Rural Marketing Management, CCBM, and KAU for her kind help, personal care and whole hearted co-operation that I have received during my work. I am immensely indebted to her for the keen interest her has shown in my work, with a lot of valuable corrections and suggestions, positive encouragement and advice.*

*I am respectfully thankful to **Dr. P. Shaheena,** Associate Dean (i/c) Professor and Head, Department of development Economics, CCBM, KAU for her valuable advice and suggestions throughout my academic career and also personal care given by her.*

I am gratefully to ***Dr. G. Veerakumaran,*** *Professor, Department of Co-operative Management, CCBM, KAU, for his valuable suggestions and support for my thesis work.*

I owe a deep intellectual debt to ***Dr. K. A. Sunandha,*** *Professor, Department of Development Economics, CCBM, KAU, for the advice, kind concern and support throughout my study.*

I also wish to express my gratitude to ***Dr. G. S.Arularrassan,*** *Associate Professor, Department of Co-operative Management, CCBM, KAU, for support given in the study.*

I remain grateful to ***Dr. Philip Thomas,*** *professor, Department of Co-operative Management,* ***Dr. Molly Joseph,*** *Professor and Head, Department of Rural Banking and Finance Management,* ***Ms. Misha Davis,*** *Associate Professor, Department of Co-operative Management,* ***Mr. Boniface P.J.,*** *Associate Professor, Department of Development Economics,* ***Dr. E. Renjitkumar,*** *Professor & Director of MBA, Department of Co-operative Management,* ***Ms. Hena M.*** *and* ***Ms. Zita. V. Bosco,*** *Teaching Assistant, Department of Rural Marketing Management,* ***Dr. Flowerin A. D.,*** *Teaching Assistant, Department of Development Economics,* ***Ms. Sruthy Maadhavan,*** *Teaching Assistant, Department of Rural Banking and Finance Management,* ***Ms. Harshini,*** *Teaching Assistant, Department of Development Economics, College of Co-operation, Banking and Management for their kind concern and encouraging words, advices and support.*

I would like to express my deep sense of gratitude to all library assistants, of Co-operation, Banking and Management for their immense help during my thesis work. I also remember with the gratitude for the support given by all staffs, Central Library, Kerala Agricultural University.

I acknowledge my sincere gratitude to ***Sri. Febin,*** *Assistant Manager, VFPCK, Thaanippadam,* ***Mrs. Anupama,*** *Assistant Manager, VFPCK, Kodaly,* ***Ajay chettan, Dharman chettan, jino chettan*** *and all respondent farmers and selected actors in the value chain and consumers in Thrissur District who co-operate with me during my survey.*

I am placing my deep sense of gratitude to all other teachers and non teaching staff of College of Co-operation, Banking and Management for their co-operation and timely support. I am also thanking to ***Dr. Ajitha T. K.,*** *Associate Professor, Department of Agriculture Statistics, College of Horticulture,* ***Dr. A.***

Prema, *Professor, Department of Agriculture Economics, College of Horticulture, for her kind concern and timely help. I am placing my thankfulness to all office staff of College of Co-operation, Banking and Management for their timely co-operation and timely help.*

I also place my sincere thanks to **Kerala Agricultural University** *for the assistance in the form of fellowship.*

Words fail to express my gratitude and indebtedness to my friends **Roshini, Sreeja, Kichu, Divya chechi, Niranjana, Sachu chettan, Keerthi chechi, Amrita, Soni, Akhila, Athulya, and Anu** *for their great support throughout my academic career.*

Good friend is a companion for life and I am glad that I got good friends like **Jesma, Joseph, Jaijo, Linto chettan, Neema, Fr. Noble, Raiwin, Bobby, Eldhose, Sijo chettan, Deepa chechi, Adwaith, Renjith, Juwin, Levin and Jo paul** *for their unfailing friendship, unimpeachable loyalty ,fervid companionship and their great support throughout my academic career.*

Words cannot enunciate the virtuous support and love given by **Ammamma, Appachan, Amma, Peppan, Joseph, Tony appachan, Jessy anti, Teslin, Dominic chettan, Nithin Chettan, panchi uncle, Viji anti, John, Diya, Indu chechi, Vava anti, Sheela anti and all my relatives and cousins** *for their long last belief, constant support, Prayers and blessings which helped me to reach where I am today.*

A word of apology to all those I have not mentioned in person and note of thanks to each and every one who have bless me with their prayers. In this moment I would like to beg a pardon to all those who have ever been hurt, knowingly or unknowingly, by my words or deeds.

Needless to say, I solely am responsible for any errors, which may remain.....

HARITHA PAUL

(2017-15-001)

CONTENTS

LIST OF TABLES

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES

INTRODUCTION

CHAPTER – 1

INTRODUCTION

Bananas are grown in more than 150 countries, and 105 million tones of fruits are produced each year, which are grown for local consumption. Today, they are the most popular fruit in the world: in fact, over 100 billion bananas are eaten around the world every year, and around 51 percent of these are eaten at the time of breakfast. The word banana comes from the Arabic word "banan", meaning finger. The banana plant is not a tree; it is the world's largest herb. There are over 1000 different varieties of bananas growing around the world, subdivided into 50 groups. Some are sweet, like the Cavendish variety, which is the most common and most widely exported. It is named after Musa Cavendishii and was first grown at Chatsworth House in UK in 1830. (Source: www.historyrecords.com/2018-2019-2020-2021/world-famous-largest-banana-producing-countries-/194573/1185). It is difficult to say where the banana had originated. Some experts say it was in India, some others said that it was in the belt between South- East Asia and the north- east part of India. In the initial stage it spread from here to Africa and the Pacific. Some horticulturists believe that bananas were the first fruit on earth. Their origin was placed in Southeast Asia, in the jungles of Malaysia, Indonesia or the Philippines. Africans were credited for giving the present name, since the word banana would be derived from the Arab for 'finger'. Trading of banana started internationally by the end of the fourteenth century. The development of rail, roads and technological advances in refrigerated marine transport subsequently enabled bananas to become the most traded fruit in the world. The table 1.1 shows the major banana producing countries in the world.

Table 1.1 Major banana producing countries in the world (2018)

Country	Area (000'ha)	Production (000'MT)	Productivity (MT/ha)	% share in world total production
India	883.7	30807.50	36.7	29.19
China	373.45	9848.90	26.37	9.65
Philippines	449.61	9101.34	20.24	8.92
Ecuador	215.65	7931.06	36.78	7.77
Brazil	486.99	6962.79	14.30	6.82
Indonesia	101.28	5755.07	56.83	5.64
United Republic of Tanzania	420.00	2924.70	6.96	2.87
Guatemala	63.53	2637.57	41.52	2.59
Mexico	76.93	2103.36	27.34	2.06
Colombia	80.52	2034.34	25.27	1.99
Other countries	1916.11	22949.05	11.98	22.49
World total	**5067.76**	**103055.67**	**22.35**	**100.00**

(Source:https://www.google.com/search?ei=gpYlXfizCYL59QPP66qYCA&q=current+scenario+of+world 2017-2018&oq.xuGfTaHc5u0)

The global production of banana is around 103055.67 thousand metric tons of which India contributes 29.19 percent. Besides India, the other major banana producing countries are china. Philippines, Ecuador, Brazil, and Indonesia.

Banana (*Musa* sp.) is the second most important fruit crop in India next to mango. Main banana growing states are Kerala, Tamil Nadu, Maharashtra, Gujarat, Andhra Pradesh and Karnataka. Its year round availability, affordability, varietal range, taste, nutritive and medicinal value makes it favourite fruit among all classes of people. It has also good export potential and very popular fruit due to its low price and high nutritive value. Bananas have been part of our diet for thousands of years, and written references date back to around 500BC. It is consumed in fresh or cooked form both as ripe and raw fruit. Banana is a rich source of carbohydrate and is rich in vitamins particularly vitamin B. It is also a good source of potassium, phosphorus, calcium and magnesium. The fruit is easy to digest, free from fat and cholesterol. Banana powder is used as the first baby food. It helps in reducing risk of heart diseases when used regularly and it is recommended for patients

suffering from high blood pressure, arthritis, ulcer, gastroenteritis and kidney disorders. Processed products such as chips, banana puree, jam, jelly, juice, wine and halwa can be made from the fruit. The tender stem, which bears the inflorescence is extracted by removing the leaf sheaths of the harvested pseudo stem and used as vegetable. Plantains or cooking bananas are rich in starch and have a chemical composition similar to potato. Eating them could help to lower blood pressure and reduces the risks of cancer and asthma. Today, bananas are grown in at least 107 countries and are ranked fourth among the world's food crops in monetary value (Source: www.thedailyrecords.com/2018-2019-2020-2021/world-famous-top-10-list/india/largest-banana-producing-states-india-varieties/18383/1245). The table 1.2 shows the area, production, and productivity of banana in India from 2011 – 2018.

Table 1.2 Area, production, productivity of banana in India 2011 - 2018

Year	Area (000'ha)	Production (000'MT)	Productivity (MT/ha)
2011-2012	569.5	1887.8	33.2
2012-2013	604.0	20998.0	34.8
2013-2014	658.0	23823.0	36.2
2014-2015	709.0	26217.0	37.0
2015-2016	770.3	26469.5	34.4
2016-2017	830.0	29780.0	35.8
2017-2018	883.7	30807.5	36.7

(Source:https://www.google.com/search?ei=fJYlXZqCE4L49QPBhpfYBg&q=current+scenario+of+india&oq=india+scenario&gswiz.pNNrHFL3rA0.)

It is an important fruit crop and cultivated in many tropical and subtropical regions of India in an area of 883.77 thousand hectare and total production is around 30807.50 thousand metric tons.

Nendran is one of the most important commercial varieties of banana grown in Kerala. At international level the variety is known as plantain. The variety is grown for both fruit and vegetable purpose. The long and thick fruits with good shelf life make nendran widely acceptable among consumers. It is also used for the preparation of banana chips. The banana is a perennial plant that replaces itself. Bananas do not grow from a seed but

21

from a sucker or rhizome, and it takes 9 to 12 months from sowing a banana sucker to harvesting the fruit. The banana flower appears in the sixth or seventh month. People often assume that the banana fruit grows on trees; however, the banana is a high herb which can grow up to 15 meters. Unlike other fruit like apple which have a growing season, bananas are available all year round. Locally consumed bananas are a staple food in many tropical countries and play a major role in terms of food security. Growing bananas is, in general, is labour intensive as it involves clearing jungle growth, propping of the plants to counter bending from the weight of the growing fruit, and irrigation in some regions. Instead of intensive use of pesticides, the conventional production process involves covering banana bunches with polyethylene bags to protect them from insect and bird attacks, and to maintain optimum temperatures. The best time for planting as irrigated crop is August to September. Nendran varieties like Nedunendran, Chengalikodan, Zanzibar and table varieties like monsmarie, robusta, giant governor, dwarf Cavendish, chenkadali, poovan, palyamkodan, njalipovan, amritsagar, karpporavalli, grosmichael, poomkalli, koompillakannan, chinali dudhsagar, are the best varieties grown well as irrigated crops. The table 1.3 shows the area, production and productivity of banana in Kerala 2012-2018.

Table 1.3 Area, production, productivity of banana in Kerala 2012 - 2018

Year	Area (000'ha)	Production (000'MT)	Productivity (MT/ha)
2012-2013	80.45	1028.50	13.89
2013-2014	80.80	1128.12	14.40
2014-2015	83.49	1245.78	15.01
2015-2016	84.56	1292.41	15.28
2016-2017	84.98	1250.55	14.72
2017-2018	109.26	1119.16	10.24

(Source: https://www.indiastat.com/table/agriculture-data/2/horticulture/118/1116096/data.aspx

Banana is the main fruit crop cultivated in Kerala, in an area of 109.26 thousand hectare and total production is around 1119.16 thousand metric tons in the year of 2018. During last year due to flood, production and productivity of banana in Kerala was very low. The table 1.4 shows the district wise status of banana cultivation in Kerala during the year 2018.

Table 1.4 District wise status of banana cultivation in Kerala during the year – 2018

District	Area (in acres)	Average Production (in tones)	Productivity (in tones)
Trivandrum	583.5	4668	8.9
Kollam	273	2184	4.5
Pathanmthitta	566.3	4530.4	8.5
Alappuzha	456	3648	5.7
Kottayam	1119.3	8954.4	9.1
Idukki	1133	9064	10.8
Ernakulam	2091	16728	14.0
Thrissur	2180	17440	15.5
Palakkad	1874	14992	12.1
Malappuram	1256.5	10052	11.3
Kozhikode	568	4544	8.1
Wayanad	675	5400	9.2
Kannur	518.5	4148	8.4
Kasaragod	135	1080	3.6
Total	**13429.1**	**107432.8**	**129.7**

(Source:https://www.google.co.in/searq=area%2C+poduction%2C+productivity+of+banana+in+Thrissur+0i71j33i10.E00NVKTvlPs&ved=&uact=5)

Mapping of the current status of banana cultivation has been undertaken to assess the flow of farmer produce to the market. Targeting the onam season, 5000 hectares are already under cultivation with Thrissur district having the maximum area under cultivation (2180 acres), followed by Ernakulum (2091acres). The average production from these districts is around 107432.8. During the onam season 2019 is expected to hit the festive market with plentiful release of banana.

Nedunendran banana is Kerala's most famous variety. It was known as the apple of paradise in the earlier days. The nendran variety is grown mostly in Kerala and Tamil Nadu in South India. It is extensively used in cooking, making use of both savory and ripe banana. The famous banana chips are made from raw nendran bananas. Ripe bananas are eaten as a fruit and also steamed and used as a dessert.

Chengalikodan banana is a famous nendran variety, which is originated in Chengazhikodu village of Thrissur district in Kerala state of India. Chengazhi nambyar,

the ruler of princely state of chengazhikodu suggested the name chengazhikodan. When this name chengazhikodan was translated to English it became Chengalikodan. It is grown in Wadakkanchery, Varavoor, Mundoor, Kaiparambu, desamangalam, Erumapetty and Thayyur of Thrissur district. This variety is offered as Kaazchakula to the presiding idol of the guruvayoor sree Krishna temple. Chengalikodan differs from other varieties of nendran as the bunch bear 20 to 25 kg golden yellow coloured fruits if properly taken care of. The pricing is determined by visual appeal and quality. Chengalikodan is planted in the month of October and are grown organically which gives its unusual yellow colour and texture. More use of organic fertilisers can affect the appearance of banana bunches. Individual attention, special care and monitoring of every stage are needed for this banana variety. Green leaf manure, ash and cow dung are used to supplement the growth. Traditional farmers cover the banana bunches with old banana leaves so that it can get the special yellow colour. Chengalikodan banana, grown in chengazikodu village got Geographical Indication certificate during the year 2015. GI stands for geographical indication which is a sign on products having a unique geographical origin and development over centuries. Chengalikodan got geographical indication registration from the Geographical Indications Registry, Chennai. The Chengalikodan Banana Growers Association, Erumapetty, was given the registration. Chengalikodan banana is known for its unique shape, size, colour and taste. The visually appealing Thrissur special Chengalikodan variety of bananas is slated to hit the onam markets in the state.

1.1 Statement of the problem

Value chain is defined as full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumer and final disposal after use. An efficient value chain in agricultural commodities must be cost effective with only essential participants required to do the job. Each point in the value chain has certain costs. An elongated and inefficient value chain does not provide value to the participants. Even though Kerala has a good potential for banana cultivation, due to careless handling of produce about 25-40 percent

is being wasted and only 2-3 percent is being processed as value added products, the remaining being used in the raw form (Report of department of agriculture and co-operation 2017-2018). This leads to price imbalance and wide price variations, both spatial and temporal, which disheartens farmers. In order to sustain production and growth potential, it is essential to produce value added products from banana, so that farmers get an assured price for their produce all the time. Due to inefficiencies at various points in the value chain, the producer gets less than optimal and the consumer pays more than optimal price.

To get better understanding of where the farmers stand in the value chain of banana, it is important to analyse the actors, their relationships and coordination, the core processes, flow of products, flow of information, value addition at different levels and their constraints also. Analyzing the value chain is important to understand the number of intermediaries in the chain, producers share in consumer rupee as market efficiency and the problems faced by the value chain actors. This will also help to understand farmer's position in the chain and help them to realise better prices. In this background, the present study focuses on an in-depth analysis of value chain of banana with the key research question to improve the livelihood situation of rural population involved in banana cultivation in Kerala.

1.2 Objectives of the study

The objectives of the study are:

- To map the value chain of Nendran variety of banana.
- To identify and analyse the various chains and actors involved in the value chain
- To analyse the cost and margins involved in the value chain and
- To identify the constraints and possible solutions at different levels in the value chain to enhance the efficiency.

1.3 Scope of the study

The findings of the study helps to know the mapping of actors, flow and volume of products, information, institution linkages and geographical flow of nendran variety of banana in four blocks of Thrissur district. This will help to identify the actors and a detailed analysis of actors involved in the value chain. The study also analysed the cost and margin received by each actors and identified constraints faced by each actor in the value chain and also to find out the way for getting better remuneration to all the chain members in the value chain.

1.4 Limitation of the study

The major limitation of this work is that the study confined to the banana farmers of only three panchayaths (five farmers each) from each selected block (Wadakkanchery, Pazayannur, ollukkara and kodakara) in Thrissur district. The different actors involved in the value chain from Thrissur district alone for the study.

1.5 Organisation of thesis

The report of the study has been presented in five chapters. The first chapter narrates the design of the study encompassing significance, statement of the problem, objectives, scope and limitations of the study and organisation of thesis. The second chapter presents the review of available literature covering various aspects of the study. The third chapter elucidates the methodology and data sources adopted in conducting the study. The fourth chapter is set aside for the results and discussion of the study. The last chapter highlights the summary of findings and the conclusion of the study followed by references and abstract of the thesis.

REVIEW OF LITERATURE

CHAPTER - II

REVIEW OF LITERATURE

Review of literature is the part and parcel of all scientific investigations which would enable the researcher to understand the research gap and justify the study. Hence any research begins with an enquiry into the studies already conducted in and the related field of study. This chapter discusses the available literature relating to value chain analysis of banana, each actors involved in the value chain, cost and margins and also the major constraints faced by each actors so as to develop and establish a theoretical framework for the study, based on ideas and concepts expressed by various authors and researchers. The studies reviewed have been classified under five heads taking into consideration the main objectives of the study and presented below.

2.1 Concepts and theoretical framework of value chain.

2.2 Studies on value chain actors.

2.3 Studies on value chain analysis.

2.4 Studies on value chain analysis of banana.

2.5 Studies on constraints faced by banana farmers.

2.1 Concept and theoretical framework of value chain

Value chain definitions:

Porter (1985) "competitive advantage" of a value chain comprise of full range of activities through interrelated activities involved in the design, production and marketing of a product.

Mc Cormick and scmitz (2001) value chain is defined as it is a set of value adding activities through which a product passes from the design to the consumption stages. The worth of the product increases at each point of the process.

Hellin and Meijer (2006) defined value chain as full range of activities which are required to bring a product or services from conception, through the different phases of production, delivery to the final customers and disposal after use.

Value chain approaches

There are three main approaches in the value chain:

1. Filiere approach (Durufle, Feabre, 1988)
2. Porter's approach (Porter, 1985)
3. Global approach (Kaplinsky and Gereffi, 1994)

Filiere approach (1988)

Filire approach (means thread or chain) was based on various school of thought and research traditions. The approach was mainly used to analyse the agriculture system in developing countries under French colonial system. The filire approach paid special attention on studying how local production systems were linked to processing industry, trade expert and final consumption. Filire approach focused on issues of physical and quantitative technical relationships, summarized in flow charts of commodities and mapping of transformation relationship.

Porter's approach (1985)

Porter had used the framework of value chains to assess how a firm should position itself in the market and in the relationship with suppliers, buyers and competitors. In his frame work the value chain provides a tool that the firms could use to determine their source of competitive advantage. Porter identified a number of primary and support activities that were common in value chain analysis. Value chain highlights specific activities through which firm could create a value and therefore it was a useful tool to simplify the analysis. Porter distinguished between primary activities which directly contributed to add value to the product or services and support activities which had an indirect effort on the final value of the product. In porter system, firm's activities were considered as a part of large stream activities which author termed on the value system. A value system included the activities implemented by all firms involved in product of goods or services, starting from basic raw materials to those engaged in the delivery of the final producers to consumer. So porter's approach was a broader approach.

Global approach (1994)

The global approach forwarded by Gereffi and korzeniewicz 1994; Kaplinsky 1999 examined the ways in which firms and countries were globally integrated and accessed the determinants of global income distribution. The disparity in global income distribution was widening unfavourably. So with the help of mapping the full range of activities along a chain, breaks down total value chain earnings into the rewards which were earned by different parties in the chain. In the present study, global approach of value chain analysis has been used for mapping of value chain which helps to understand the overview of value chain as well as constraints and possible solutions at different levels in the value chain. Even though there is no comprehensive method in mapping value chain, there are eleven potentials which can be mapped for understanding value chain better. They are:

1. What are the core processes in the value chain?
2. Who are the actors involved in these processes and what they actually do?
3. What are the flows of product, information and knowledge in the value chain?
4. What is the volume of products, the number of actors and jobs?
5. Where does the products (or service) originate from and where does it go?
6. How does the value change along the chain?
7. What types of relationships and linkages exist?
8. What types of services are feeding in to the chain?
9. What is the location and position of the poor in the value chain?
10. What key constraints exist at various levels in the value chain and what are the potential solutions to those constraints.
11. How do products, information, and knowledge flow through the value chain?

2.2 Studies on value chain actors

A study undertaken by Verma (2004) examined the price spread, marketing efficiency and constraints in marketing of onion. A multi stage random sampling technique was adopted for data collection. The study was conducted Indore block of Indore district of Madhya Pradesh where onion is an important crop. Stratified random sample procedure

was adopted for the selection of villages and onion producers. A sample of 80 farmers was selected randomly. These farmers were stratified into three group's viz., small, medium, and large farmers. The study found out three channels of marketing viz., channel 1- producer, and consumer. Channel 2- producer, retailers, and consumers. Channel 3- producers, wholesalers, retailers, consumers. The producers share and marketing efficiency were highest for channel 1 as there were no intermediaries in between producers and consumers. Unremunerative prices during the peak season and lack of storage facilities, high price of seed, fertilisers and pesticides, costly transportation and market charges, inadequate skilled labour and lack of credit facilities and information about arrivals and prices in the major consuming markets were main problems reported by onion producers.

Nikam et al (2007) studied marketing of potato in Pune and Satara districts of Maharashtra. The research revealed that all the overall level, the average per quintal cost of marketing was 88.70 of the total marketing cost, the items such as commission, transport cost and packing cost were observed to be the most important items of cost which accounted for 44.60 percent, 22.36 percent and 16.72 percent respectively. These items together shared 88.68 percent of the per quintal marketing cost. Remaining 11.21 percent of marketing cost shared by grading wages, weighing and marketing fee which accounted for 5.35, 2.15 and 1.19 respectively.

Shelke (2009) studied the marketing of potato in Maharashtra. During the peak period of arrivals the wholesale and retail prices of potatoes were much lowered. There was much wide difference between wholesale and retail prices. The margin of the retailer was extra ordinary high in all the vegetables under study. The retailers share ranged between 12 to 41 percent while the producer's net share ranged between 42 to 57 percent. Producers can be highly benefited and increased their share to 95.85 percent from 55.35 percent in consumer's price by selling their vegetables directly to consumer rather than selling to wholesaler. Hence producers should arrange to sell their vegetables directly in the consumers market wherever possible.

Basu (2010) examined the marketing efficiency of potato markets in west Bengals Hooghly district. The analysis was made at three levels, namely wholesale markets, retail

markets and village market. The analysis using the co integration test revealed that the potato markets were integrated and efficient. The study simultaneously covered two regions the cold storage concentration zone and the non – concentration zone and concluded that efficiency, as revealed by integration of wholesale and retail markets, cannot coexist with a complex and non competitive market structure at the village level. This means that the village findings support the inefficiency of potato marketing. There was a need to intervene the private corporate sectors in the potato market to enhance the efficiency at the village level.

Gangwar et.al (2010) compared two distinct kinds of markets via organized and unorganized for broilers in national capital region Delhi. The study was based on secondary as well as primary data collected from different market functionaries like poultry producers commission agents, processors, suppliers, wholesalers, retailers and consumers involved in the performance of marketing of broilers. On the basis of data collected marketing cost, marketing margin, price spread and efficiency were worked out on each of the identified channel. Simple tabular and standard analytical tools were used to analyse the data. The marketing efficiency was worked out by applying methodology suggested by Acharya and Agarwal (2004). The study concludes that wholesale regulated poultry market was the key supply center for chicken and 70 percent broilers in the market were manually dressed and it provides employment around 5000 workers.

Reddy and Murthy (2010) had conducted a study in Andhra Pradesh about value chains and retailing of fresh vegetables and fruits. The objective of their study was to examine the growth and performance of modern retailing and its impact on traditional retailers. Vertical analysis was used for the study. The study results indicated that number of players was less in modern retailing than in the traditional retailing. In the vertical distribution farmers got first rank, followed by middlemen, wholesalers in the traditional retailing, whereas in modern retailing super markets got the first rank. It concluded that there was both demand and supply side factors that contribute to the emergence of traditional and modern retailing. So efficient value chain management would be certainly adding value to the products and it helps in brining the product to the market.

Umagowri and Chandrasekaran (2011) in his study on the value chain of banana sector in Western Tamil Nadu, aimed to find out cost, returns, post –harvest losses, price spread and marketing efficiency were worked for the different varieties of banana like Nendran, poovan, kathali, and robusta. The analysis report showed that the marketing efficiency for nendran was higher in channel 1, and for the other varieties, the efficiency was higher in channel 2- poovan, kathali, and robusta. Study concluded that to prevent the post- harvest loss, there was a need for training in post-harvest handling of fruit bunches. To improve the marketing efficiency, the growers should sell their produce directly to the wholesaler feasible or tie up with the processor or retailer wherever feasible; and farmers must have the latest market knowledge, for taking better sales decision.

Venkatesh (2011) analysed important marketing channel and actors involved for domestic coffee, coordination between actors of the coffee value chain and distribution of value added between the different actors. Semi structured questionnaire with both open and close ended questions were used to interview the farmers and other actors. Simple descriptive statistical tools, market cost and price spread were used to analyse the data. The study found out that share in profit received by small farmers was very less. In addition, to that poor quality and low quality of supply were huddles for small producers in gaining direct access to international market. Innovations in mechanisation, financial support, flow of information etc. could improve the efficiency of value chain.

Susheelmamma (2014) had studied on the price spread and efficiency of marketing of tomato in Rajasthan with special reference to Jaipur and Jota purposively with higher area and production. A sample of fifty tomato farmers and five intermediaries each from agents, wholesalers and retailers were selected and surveyed. For the purpose of the study producers share in consumer's rupee and modified measure of marketing efficiency suggested by Acharya's method was used. The author found out two major channels:1) producer, commission agents, wholesaler, retailer and consumer. 2) Producer, village trader, wholesaler, retailer, consumer. The channel one was found more efficient than channel two in the area of the study. The author suggested that the value chain addition and exploitation of export and urgent need for efficient market information in the state

Sulthan Usman Mohammed (2016) in his study focused on the analysis of wheat value chain in Sinana district of balekone with objective of analysing the market conduct performance of what markets, identifying the determinants of wheat supply to market outlet, choice of wheat producers and wheat value addition at different stages of marketing chain. The study covered 120 farmers and 37 wheat traders for study. Descriptive statistics and econometrics models were used to analyse the collected data. The main actors in wheat value chain in the study area were input suppliers, farmers, assemblers, wholesalers, processors, retailers, commission agents and cooperatives. The study pointed out that access to market information, quantity of what produced, distance from market place, access to extension and credit services significantly affect farmer's decision to be engaged in value addition. Therefore, policies aiming at increasing farmer's awareness of value added wheat production to enhance value creations are recommended to strengthen to chain development.

2.3 Studies on value chain analysis

Kaplinsky and Morris (2001) studied on "value chain in vegetables in Hatay region of South East Turkey inferred that value chain in vegetable market was the bridges to connect between the productions zones to consumption markets. In this region, marketing operation was based on the development of private traders system. They concluded that specific strategy was needed for improvement of adaptation to the market changes from the producers to traders. They recommended that the development of vegetable value chain by establishing co-operatives, associations and unions at production level.

Value chains of milk and milk products in organized sector of Tamil Nadu - comparative analysis, an article paper (2010) by Babua and Veramb had attempted to investigate the value chain of milk and milk products in the co-operative sector and private dairy plants. The data collected from one co-operative plant, one private plant, five milk transportation routes, ten co-operative societies, ten private milk collection centers and six chilling centers. Average method was used for their study. The study concluded that price of toned milk, standardized milk, full cream milk had higher price in co-operative plant than private plant. They got value added products from milk like peda, Khoa, and SMP (skimmed milk powder), ice cream etc and the another conclusion was that marketing

margin and marketing efficiency had been found higher in toned milk and butter for the private plant and in full cream milk, ghee and SMP for the co-operative plant.

Bhavya (2010) in her study "Value chain analysis for coffee in Karnataka state, India" aimed at development of small coffee producers. Growers were the sole masters in their produce. Presently, coffee marketing has been dominated by the intermediaries who have made small producers to remain in their authority. The results showed that coffee consumption sectors were highly brand driven which had made difficult to penetrate. The information flows had been limited to the intermediaries. In the value chain the share of the profits received by the small producers was found to be very less. Producers faced problems throughout the production and marketing process. Quality of the produce and quantity supplied played a major role in the international market. Poor quality and low quantity supply had been a problem for the small producers in gaining direct access to the international markets. It was concluded that innovations through upgrading the activities, collective action of the producers may ease their way to higher profit margins. While innovations in mechanizations; financial support may help the producers to improve their production activities. Furthermore, efforts were required to see that there was proper flow of information and to reduce the role of intermediaries which helps the small producers to make their position better in the value chain.

Niraj and Sanjeev (2010) conducted a study about the value chain analysis of coconut in Orissa. The study aimed to meet the economic needs of people dependent on their coconut marketing. The study conducted in five coastal districts of Orissa, and examined the market chains for coconut to find out the flow of product from farmers through different intermediaries to the consumers. Marketing channels have been found to be well established in the state, particularly in the coastal areas. No major value addition was done by the players at any level. The existence of functional channels explained that production and marketing system of coconut in the state could manage both increased supply and increased demand. The study had observed that a high ratio of vendors v/s farmers and aggregators v/s vendors in the channel. In spite of this high ratio, both vendors and aggregators were able to earn profit and are continuing the business. Researcher suggested that coconut based industries should be jointly promoted by state

industry department, state agriculture department and Coconut Development Board for supporting the livelihood of farmers.

An article on structure, conduct and performance of value chain in seafood farming in India were done by Krishnan and Narayanakumar in 2010. The report was inquiring into production, institutional, marketing, and social and community relationships in small scale seafood farming in the Ramanathapuram District of Tamil Nadu. This article substantially proved that committed and synergetic production, marketing and institutional arrangements enabled by corporate leadership, offers considerable savings in transaction cost. The SHG model had also showed that gender orientation in the initial years of the seafood culture in the district contributing to strong structural foundations to the movement. The seafood sector in the coastal India had the entire potential rise from the low income conditions normally associated with basic livelihood activities to higher levels of employment- income – consumption relationships.

Sharma et al (2010) examined the value chain analysis and financial viability of agro processing industries in Himachal Pradesh. Two stage stratified sampling design was followed by to select the district and processing units. Three districts each from backward and developing region was selected. These units were grouped into different categories on the basis of commodity specific agro processing cereal based, oil based and vegetable based unit. The Break Even Analysis showed enough leverage for processing units to stay in business even at low capacity utilization. The financial viability ration computed shows high current ration and low quick ration in most of processing industries. A direct relationship had been found between size and backward linkages. The study recommended emphasis to develop raw materials producing region, thus on small scale industries for self employment in rural areas, promoting of subsidiary and supporting industries to diversify the value chain.

Jadav et al (2011) studied on economic analysis of supply chain of fresh potato in middle Gujarat with objective of studying different supply chain approach of fresh potato and analysed their efficiency and to study products and marketing constraints of potato cultivation. Multistage sampling technique was used for study. Absolute margin of

middleman and modified measure of marketing efficiency suggested by Acharya's (2004) were used for study. The major marketing channel found out in the study was producer, wholesaler cum commission, agents, retailer, consumer which covered more than 60 percent of market surplus. The major marketing constrains faced by the vegetable grower engaged in potato was lack of marketing information and transportation facility and higher production expenditure and price fluctuations. To overcome these problems facilities of cold storage, adequate transportation facilities, facilities of vegetable cooperate society were suggested.

Madhumitha (2011) studied the value chain analysis of vegetables grown in Udhagamandalam district of Tamil Nadu, pointed that the possibility of various inventions in the value chain could add value to the product and improve the efficiency across the channel. The study included the estimation of marketing costs, marketing margins and price spread of the selected vegetables. Primary data were collected through pre- tested structured questionnaire schedule. The data were analysed by using Garrett ranking techniques. The study found out the three marketing channels for the selected vegetables like carrot and potato. The margin of the wholesalers was less in comparison to the retailers. The major problems like price fluctuations, inadequate credit facilities, and storage facilities were faced by farmers in that area, and also transportation problem, non- availability of credit and inadequate storage facilities were faced by the intermediaries of value chain. From the study they identified the weak links in the value chain and possible strategies were suggested to strengthening the value chain.

Brane and Radoslav (2012) in the study on value chain analysis for meat and meat products examined the competitive pressures, constraints and market opportunities. For data analysis qualitative (Porters diamond method) and quantitative research methods were used. They found that value chain of meat and meat products were in competitive pressures, ensuring food safety was identified during the work. Analysed value chains were poultry, beef and pork which showed a certain level of similarity with regards to their stake holders and value chain structure. The study suggested improving the infrastructure conditions to meet food safety standard and joint action in area of marketing and promotion of products.

The article, analysis of rice value chain in Tanzania by Nkuba et al (2012) summarized the constraints and identified the feasible upgrading in value chain. A sample of 240 producers, 60 traders, 30 processors were taken for their study. The result showed that rice was a staple crop for more than 50 percent of communities in Kyela, Myomero districts; and less than 30 percent in Rorya, Maswa districts. SARO 5 was the only improved variety widely grown on that area. Around 61 – 93 percent of farmers sold their rice paddy to collectors, used non- standard measurements. The study concluded that upgrading strategies were required, that could increase producers market share and improve competitiveness of rice value chain.

Anisa *et.al* (2013) examined value chain analysis of medicinal plants from Berati region in central Albania that aimed to analyse the value chain of medicinal plants. The data were collected from past five years of exporting medicinal plants to various countries. SWOT analysis was used for the study. The study report showed that medicinal plants exporters faced so many problems like lack of information as well as with price fluctuation in the international market and also noticed that the lack of relationship between primary collectors and exporters affecting the price and supply with medicinal plants. It concluded that an integral relationship among actors was needed for well functioning of the entire medicinal plants value chain. The medicinal plants cultivation and preservation of natural habits as well as of genetic material of wild medicinal plants were considered as important steps for sustainability of their trading.

Value chain analysis of gerbera cut flower in Kathmandu, an article (2013) by Bhattarai *et.al* analysed the competitive measures and to identify the value chain actors in Gerbera cut flowers. They purposively selected Kathmandu valley for their study. Data collected from 30 respondents including producers, wholesalers, and retailers from Kathmandu valley based randomly. They found from the study that better crop management, grading, storage, packaging, decoration, and floral arrangement were the major value addition activities. Share of work in value addition was found higher by female workers compared to that of male. The most of value added activities were at producer's level and retailer's

level. Governmental organizations, banks, and farmers group were identified as supporting and enabling organizations in the value chain of Gerbera. Input suppliers, producers, wholesalers, retailers, and consumers were the major actors in the value chain. The study concluded that government played a vital role in extension and regulatory function in addition to that it would note inadequate and also government should harmonize their policy for the promotion of value chain in gerbera business.

The study on value chain analysis of tomato in different ecological regions by Basnet (2014) analysed the value chain in three different agro- ecological zones of Nepal. Primary data were collected from 100 respondents including input suppliers, producers, wholesalers, retailers and consumers from Kathmandu district. The problem of blight and wilting was pointed out as mostly faced by farmers. Input Suppliers, Producers, Cooperatives, Middle Man, Traders, Wholesalers, Importers, Retailers and Consumers were found as major actors of tomato value chain. It concluded that farmers were attracted towards adoption of value chain approach in tomato that could improve the profitability, coordination among various actors still remain inadequate. They suggested that government should harmonize their policy for the promotion of value chain in tomato business.

The study on value chain analysis of fruits for Debub bench Woreda, Bench Maji Zone by Muluken (2014) focused on the objectives of describing the channels and actors involved on fruit value chain, analysing the governing structure, analysing the value addition and distribution between the different actors, and also identify the constraints in the value chain. The primary data were collected from 182 farmers and 20 traders. Data analyses were done through SPSS Version 20. The study found that fruits pass through several intermediaries with little value being added before it reached to the end users. Therefore farmers were forced to capture lower share of profit margin. The highest marketing costs were incurred by wholesalers whereas profit share was more for retailers. The study result exhibited that fruits producers are faced low supply of fruits seed, low irrigation facility, lack of technical training, lack of credit access, low yield, On marketing side, storage problems, low price of fruits, price fluctuations, and trader give

same price and no market. The major actors were identified as producers, local collectors, wholesalers, retailers, and consumers. The study concluded by suggesting the need for improved storage and transportation system, offering credit and other services to improve effective production and marketing of fruits.

Richard bwalya (2014) in his study – 'Analysis of the value chain for indigenous chickens in Zambias' found that even enormous potential that indigenous chickens have, for sustaining livelihoods, their production and marketing, has been mostly neglected resulting in the subsector being highly under developed with poor linkage between producer and consumer. Objective of the study was to map, analyse the value added and associated cost in the chain. High mortality of indigenous chicken in household was the reason of low productivity. This low productivity leads to unplanned sales. Limited knowledge of producers on methods of diseases prevention and breeding practices also reduced production. Even though the study showed a positive gross margin for all players along the chain there was need to address various constrain affecting the value chain to improve the operation of the chain and hence improve the income of value chain actors.

Value chain analysis for derived products from paddy; a case study of Karnataka state, an article paper (2015) by Nagaraj and Krishnagowda attempted to find out the practices, end products, and estimated of value creation, value realization, and value loss to the stakeholders across its extended value chain of paddy in the state of Karnataka. They used the existing estimates for legitimate variables of the analysis. They found that supply chain of paddy was very complex process dominated by network of intermediaries called "mill owners and stockists" who made an investment worth not less than Rs. 8000 crores. In this process they observed that farmer was the only stakeholder, who paid least and supply chain management of paddy suffered from huge losses to the government as more than 65 percent farmers sold paddy to the local agents of mill owners and stockists. They suggested that using e- governance and public private partnership (PPP) in managing the supply chain of paddy which ensured full proof mechanism not only to control prevailing losses but also arrived at a unique wealth creation opportunity, which could redefine the face of agricultural developments in the state.

Safarazasgher (2015) in his study of supply chain management and marketing of apple in Kashmir region of Jammu and Kashmir: 80 apple growers and 40 market intermediaries were selected from four villages' viz., rafiabad, sopore, kellar and shopian in Jammu And Kashmir State. Four channels identified in apple marketing are, channel 1: producer, pre-harvest contractor, commission agent cum wholesaler, retailer and consumer. Channel 2: producer, village trader, wholesaler, commission agent, wholesaler, retailer and consumer. Channel 3: producer, wholesaler, retailer and consumer. Channel 4: producer and consumer. Producers share in consumer rupee was highest in channel 4 which was shortest channel. The market efficiency Indices of channel was found 0.641, 0.79 and 2.56 respectively. The major constrains pointed out was lack of labeling, trade marketing, involvement of too many middleman, spurious pesticides and fungicides were highest in the study area. The study suggested improvement in market information, quality of fruit, provision of cold storage to increase producers share in consumer rupee.

Abiodum (2016) studied on assessing the participation of physically challenged people (PCP) in agricultural value chain as a means of food sustainability in Nigeria. For the study one hundred and five respondents that belonged to physically challenged associations were interviewed through the use of structured interview schedule. Data analyses were carried out by using frequency counts, percentage, mean, standard deviation and correlation. The results of the study showed that more males were found in this category compared to females, and they were of productive age. There was a low level of participation in agricultural value chain due to negative perception to agricultural production, inadequate access to appropriate education and information, inadequate training in the area of agricultural value chain where PCP can be engaged, inappropriate technology, inadequate credit facilities and negative attitude of people to the plight of the PCP. It concluded that there was a need to create enabling environment that would encourage the PCP to participate in agricultural production to enhance food security and poverty alleviation.

Value chain analysis of vegetables: the case of Ejere distric, west shoazone, Oromia national regional state of Ethiopia, in the article by Addisu (2016) analysed the value chain of vegetables in selected location of Ethiopia. Data were collected from both

primary and secondary data. The primary data were generated by pre- tested structured questionnaire, for 120 farmers, 30 traders and 35 consumers. The data were analysed by two stage least square regression model. They found that chain was governed mainly by wholesalers with the assistance of brokers. The study concluded and suggested that they need to improve the input supply system, improving farmers knowledge and experience on vegetable production, encouraging adult education through extension service, improving productivity and volume sales of vegetables, strengthening the linkage/ interaction among vegetables value chain actors, expanding accessibility of market infrastructure and strengthening supportive institutions.

Value chain analysis of vegetables in the humid tropics of Cameroon, a conference paper by Jean et.al (2016) analysed value chain in selected location of Cameroon. Structured questionnaire was used for collecting data. Around 162 producers, 65 traders, 12 exporters, 30 processors and 29 transporters in the study area were surveyed. The analysis included value chain mapping and economic evaluation of value chain. Most of the vegetable farmers generally had poor access to input and output market support service, including agricultural credit. Economic analysis of the value chain shows a benefit – cost ratio higher than one for vegetable production, processing and marketing. The study indicated that the vegetable sector was typically profitable for all actors but had disparity in the earnings.

Kumi (2017) in her study on value chain analysis of tomato in the Kpone Katamanso district of Ghana identified the actors and their functions and existing linkages, cost, returns and profit distributed along the chain by actors. The data were collected from 210 respondents (120 farmers, 39 distributers, 31 retailers, and 20 consumers) by well structured questionnaire. He found that farmers, distributers, (assembles and wholesalers) and retailers were the main actors in the value chain. The study concluded that so many problems faced by farmers at the time of cultivation, but at the same time ready market existence for trader association, increasing use of tomato, food security and its derivatives were regarded as opportunities.

2.4 Studies on value chain analysis of banana

Pradhan *et.al* (2012) studied value chain analysis of banana with the aim of identifying the variable gap in value additions of banana enterprise in India. Ownership status, size of holding, family labour, family expenditure and family income were taken as the variables for the purpose of the study. The data were collected from the channel distributers in value addition with the help of banana farmers. The collected data were analysed by using percentage and path analysis. The results showed that age had a noticeable direct impact and at the same time family income and size of holding had highest indirect effect to characterise the consequent variable gaps in value addition.

Roshini (2012) in her study entitled "Value chain of banana and pine apple in Sri Lanka" focused on identifying the characteristics and inefficiencies in the value chain of banana and pineapple. Some of the issues were identified through the analysis required policy as well as public sector action. Large scale pineapple and banana growers and traders had their own storage and packing facilities, but the facilities varied widely in technical and management qualities. The growers tried to increase the weight of both fruits, but the result was higher moisture content in pineapple and damaged skin in banana. Most of the small scale farmers sold to nearest collecting centers, the collecting centers immediately transferred to labours, and due to the handling of labours the bottom of bunch would make more damages. It leads to loss for farmers. At the same time processing companies faced so many problems like insufficient raw material supply, lack of credit facilities, high labour cost, high price of quality packing material and especially high price for fresh fruits. They concluded that it was necessary to strengthen public – private to produce healthy seedlings to satisfy farmer needs and implement a plant distribution programme with varieties that were demanded in target market.

Garmin et al (2013) examined banana value chain in central America- options for small holders on domestic and regional markets aimed to analysing profits received by farmers from banana cultivation and options for upgrading. The researcher identified two types of national value chains i.e. 1) local chain, where farmers transport small amounts of

bananas and sell them directly to wholesalers in the district capital where they were sold locally, 2) a longer chain with intermediaries buying at farmer gate, followed by bulking, transport, ripening businesses, wholesalers, retailers directed to consumers in the country's capital. In the longer chain, the share of the final price received by the farmer's was lower; farmer profit was slightly higher due to higher consumer price and lower farmer investments in transport. The study concluded and suggested that transport was a major limitation for receiving higher prices due to remoteness of the farms in coffee-growing highland areas. Requirements of minimum quantities and timing of supply imply that substantial investments in farmer organization would be necessary.

Rinchui (2013) in her study entitled "value chain analysis of banana (nendran) in Vellangallur block, Thrissur District aimed to map the value chain of nendran banana and also to analyse the main actors along the chain. The study revealed that value added products being processed by the processors despite the fact that there are lots of value added products that can be made out of nendran banana. Study concluded that to uplift the farmers, and improve agricultural sector, government have to provide infrastructural facilities and training programme for value added products.

Sachchida (2013) studied on "value chain of banana in Bardiya district of Nepal". The study was conducted through the questionnaire survey. Thirty banana farmers were selected from Gularia, in Bardiya district by using simple random sampling technique. To study the marketing aspect of banana thirty traders (ten contractors, ten wholesalers and ten retailers) were selected and interviewed. The only marketing channel was producer – contractor – wholesaler – retailer – consumer. The maximum value addition were seen in wholesaler's level which was calculated as 50 percent of total. The producers share was 43.10 percent for the larger farm size. Infestation of pest and diseases, banana weevil and bunchy top virus were the major problems in banana cultivation. The other problems were identified as wind damage, theft, animal damage, irrigation problem, market and input access. The major marketing problem faced by the banana producers were fluctuation in price followed by lack of marketing information, large gap in consumer's price and farm gate price, sale on credit and lack of collection center. The study

concluded that the opportunities in the banana cultivation like the supply of good and quality inputs, increasing credit facilities with lower rate of interest and formation of strong marketing groups suggested that the banana farming could be established as a profitable enterprise in Bardiya district owing to its economic return.

Ann and Ajjan (2014) in their study "Banana value chains in South India" examined two banana value chains (BVC) based on the research conducted in South India in 2014. BVC -1 was the traditional value chain that sources bananas from small farmers for distribution through nearby destination markets in South India. BVC – 2 the state of art value chain that included those farmers that supplied to both major and independent retailers in South India, through a wholesale agencies with some farmer ownership. The both farmer chains lived in a relative isolation from the main markets for their bananas. Prices for their bananas depended on their market prices in the city, upon which they had little control. The research paper focused on how the farmers were distanced from key markets. Both the chains were mostly dealing in cash between farmers and their buyers which was completed through a relative or fixed pricing system with little bargaining effort from the farmers. The study concluded that BVC -1 channel farmers were trusted based on their traditional ethical values to secure supplied banana in the villages. BVC – 2 farmers were trusted in their intermediary developed over time in their relationship and by making comparisons between the prices received by farmers for their bananas and the market information they had.

The study on value chain mapping of njali poovan – a case study with special reference to meloor panchayath by Ashitha (2014) focused on mapping the different value chain actors of njali poovan and to identify the key constraints and opportunities of value chain. The data required for the study was collected through the purposive sampling among njalipoovan farmers. Data were collected from primary and secondary data sources. The collected data were analysed by using the tools like value chain mapping, percentage analysis and Indices number. The study concluded that at each level, actors were adding values to the product. Mechanization of farming operations, formation of labour bank

and inclusion of njali poovan farming under MGNREGS would be gone for a long way in solving problems of high wage rate and shortage of labour faced by farmers. Promotion of organic farming would improve the quality, hygiene, and odour and taste of njali poovan banana and it would help to reduce the dissatisfaction of consumers about those factors and price.

Muchai (2014) had conducted a study on an assessment of the banana supply chain in south Imenti, Meru County, Kenya with the objective of assess the stakeholders' linkages at production level and to access the postharvest challenges in Banana Supply Chain. Situational analysis was carried out to assess factors contributing to post-harvest challenges faced by farmers and traders along the banana supply chain. A total of 132 respondents including; 90 farmers and 42 traders were sampled purposively and interviewed using semi- structured questionnaires. The study found out that the key players in this supply chain were traders, transporters, price takers. The analysis revealed that main challenges contributing to post-harvest losses were products developing unacceptable qualities such as color and texture due to over ripening, inappropriate post-harvest handling techniques, and lack of structured / organized market for harvested produce, inconsistence in production as a result of reliance on rainfall. The study recommended that the service providers in the banana supply chain in Imenti South should capacity build the farmers to form groups for input and output markets, introduce new varieties that meet market demand and invest in value addition and processing opportunities for improved incomes for banana production.

Alex *et al.* (2015) in their study on 'Assessment of innovative market access options for banana value chain in Uganda' identified innovative market access options among the value chain actors in Uganda as a basis for projecting the potential. Cross sectional research designs incorporating 240 value chain actors were employed for the study. The major innovative market access options access during the study were collective marketing, contract farming, mobile phone plat forms, value addition options and super markets.

Swetha and Naik (2016) conducted a study on value chain management in banana and sapotta fruits and its supply forecast in India with the objective to analyse the cost and returns in value chain management. The results were based on primary data collected with the sample size of 8 processing unit, 20 wholesalers cum commission agents and 20 retailers for each of the fruit crops. The result revealed that Stake holders in value chain of both the cases of fruits (banana and sapota) were not integrated; there was a great opportunity to integrate and strengthen the value chain.

Teklay (2016) in his study on value chain analysis of banana in Tekeze River basin, North Ethiopia, stated the functions and power relationship of the value chain actors, and their profit share in the chain for the commodity. Both qualitative and quantitative data were used for the study. Samples were selected randomly from different actors in the chain. Marketing costs, margins and value share of the different marketing participants were examined by using the chain performance indicators. He found three common marketing channels of banana from the studied area. Marketing costs and margins were analysed to determine the profit shares of the actors and value addition by intermediaries along the chain.

2.5 Studies on constraints faced by farmers

Agarwal and Saini (1995) conducted a study in Jaipur market of Rajasthan among vegetable growers to find out the problems relating to marketing. The specific objective of their study was to assess the price spreading marketing of cole crops through different marketing channels. Two villages namely, Mahapura and Bhankarota were purposively selected for the study, as these villages grow cauliflower and cabbage as their main crop. Fifty farmers from among small and medium and large groups were interviewed for data collection. The marketing channels were identified after studying the sales pattern of selected farmers. The marketing cost, margins of middle man and producers share were calculated using standard formula. The researchers identified two channels in the area of the study such as channel 1, which including producers, commission agents, retailers and consumers and channel 2- which include producers, commission agents, retailers and consumers. Most of the farmer adopted second channel of marketing. The marketing cost

was higher and the producers share in sale of cole crops was low for this channel, due to more number of intermediaries. The study suggested for modifying the regulatory frame work to protect and promote increased vegetable production.

Ouma et.al (2010) their study titled constraints faced by banana marketing industry in Rwanda identified the constraints faced by the farmers, traders, and consumers in the marketing industry. Samples of fifty farmers were selected randomly and the other actors were selected based on the information received by farmers. The collected data were analysed by using Indices method, and descriptive analysis. The results showed that insufficient finances, inadequate transport facilities, difficulty in assembling the producers, inadequate storages, unfair taxation and inconsistent price signals were identified as the major constraints faced by them. The study concluded that there was a promotion of desired banana varieties in target areas and development of formal banana beer processing technologies; thus increased the job creation and revenue creation of traders.

Deshmukh *et al.* (2013) analysed constraints in banana marketing and scope of improvement. The paper describes about the banana marketing network, identifies the role of various agencies involved and addresses their explicit problems. The study results showed that India owes the credit of being leader in global banana production. Maharashtra state enjoys the status of being the leader in the country for banana production and marketing. Government must initiate awareness and training programs for the banana farmers and should reach to them through electronic media, promotion of low cost modern biotechnology, loan at concessional rate of interest by Government authorities to banana farmers were the recommendations of the study.

Wanyama (2014) in her study on assessing the determinants of tissue culture banana (TCB) adoption in western Kenya focused on identifying the determinants of effecting banana tissue culture adoption. Both descriptive (mean, variance, promotions) and regression analysis were used for analysis. Data collected from three hundred and thirty farmers were selected random sampling technique, from selected sub-locations. The results revealed that TCB adoption was significantly influenced by the proportion of

banana income to the total farm income, per capita household expenditure and the location of the farmer in the County. The study concluded and suggested that actors along the banana value chain were encouraged to target the intervention strategies based on the identified farmer, farm and institutional characteristics for enhanced impact on food provision. Opening up more TCB multiplication centers in different regions would make farmers access the TCB technology for enhanced impact on the target population.

Major issues and challenges in supply chain and fruits and vegetables agribusiness in Uttarakhand was studied by Saouravneji (2015). The objective of the study was to identify the issues and challenges related to fruits and vegetable supply chain in Uttarakhand state of India, and to suggest mitigation for the identification challenges in the supply chain of fruits and vegetables. Descriptive research has been used for the study. The study concluded the fruit and vegetable supply chain is improper in the study area. Lacks of cold storage, food processing units were leading to maximum inefficiencies resulting in losses and wastage of fruits and vegetables in Uttarakhand and India as a whole. The major issue post- harvest losses and wastage due to long distances to market, higher dependency if intermediaries, poor road infrastructure, inefficient madi system, inadequate cold chain facilities, high cost of packing, poor quality of distribution, weak link in supply chain etc. were the main problem in supply chain of vegetables and fruits. The study suggested there was high potential for development agribusiness by setting up cold storage infrastructure and food processing units.

MATERIALS AND METHODS

CHAPTER - III

MATERIALS AND METHODS

The study entitled "value chain analysis of banana; nendran variety in Thrissur district" was aimed to map the value chain of nendran variety of banana, identify and analyse the various chains and actors involved in the value chain, analyse the cost and margins involved in the value chain and to identify the constraints and possible solutions at different levels in the value chain to enhance the efficiency. The methods used to study these objectives were explained in this chapter under the following heads.

1. Concepts used in the study
2. Location of the study
3. Source of data
4. Sample design
5. Variables measured
6. Data collection
7. Data analysis

3.1 concepts used in the study

3.1.1 Value chain

Value chain is the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and producer services), delivery to final consumer and final disposal after use.

3.1.2 Value chain mapping

Mapping is a tool used in value chain for pictorial representation of value chain analysis for better understanding the connections between the actors.

3.1.3 Core process

Core process is the basic process which occurs from input of raw materials to outputs with added value to customer.

3.1.4 Marketing channel

A marketing channel is the people, organisations, and activities necessary to transfer the ownership of goods from the point of production to the point of consumption. It is the way products gets to the end user, the consumer; and is also known as a distribution channel.

3.1.5 Forward and Backward linkages

A forward linkage is created when investment in a particular project encourages investment in subsequent stages of production. A backward linkage is created when a project encourages investment in facilities that enable the project to succeed.

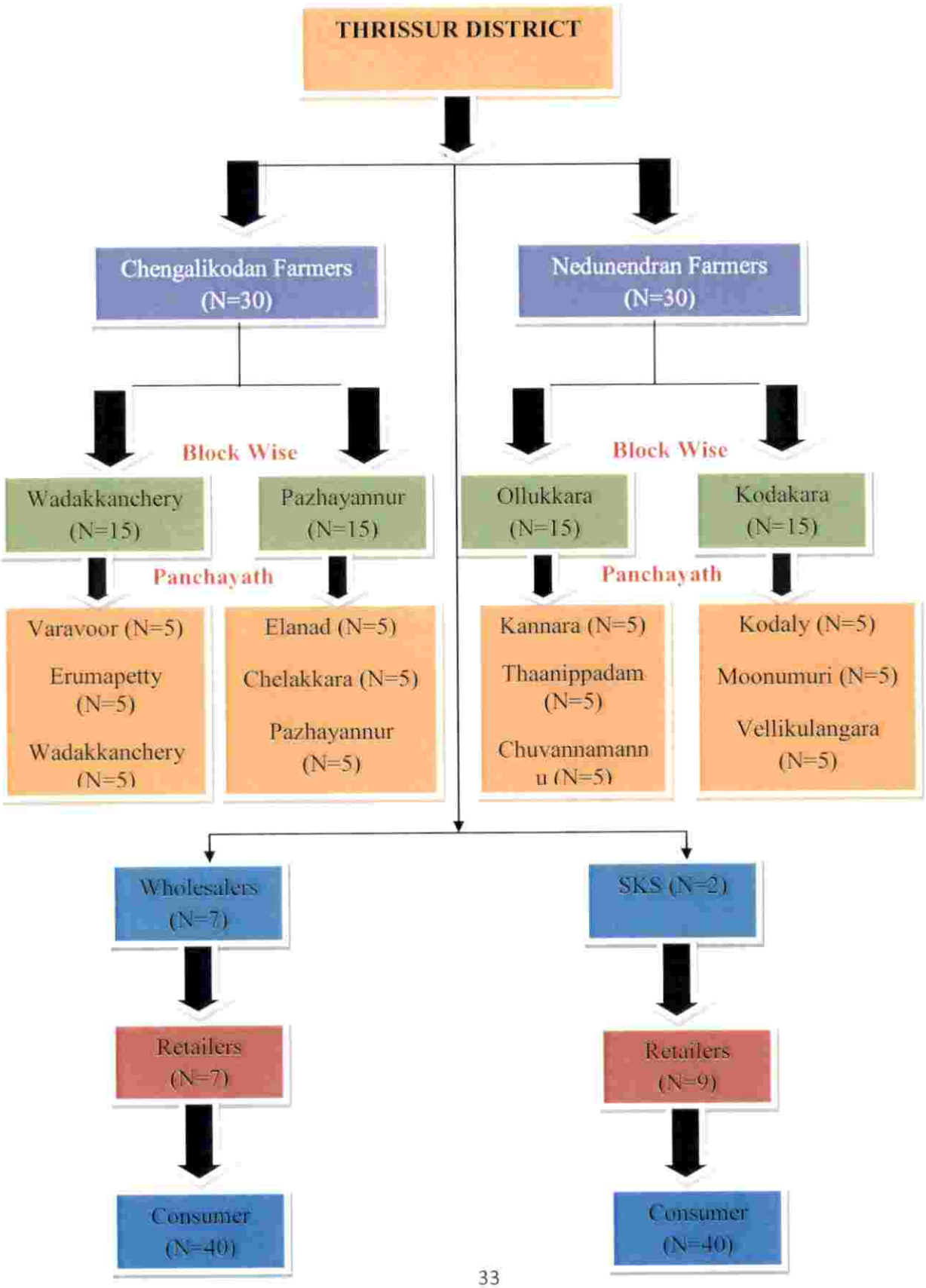
3.2 Location of study

The study area was confined to four blocks in Thrissur district namely Ollukkara, Kodakara, Wadakkanchery, and Pazayannur.

3.3 Sources of data

Primary and secondary data were used in the study.

3.4 Sample design



The study was confined to Thrissur district in Kerala. A multistage sampling procedure was adopted for the selection of banana farmers. From Thrissur district four blocks namely Wadakkanchery and Pazhayannur (Chengalikodan), ollukkara and Kodakara (Nedunendran) were selected based on maximum area under banana cultivation. From the selected four blocks three grama panchayaths from each block with highest area under banana cultivation was selected. From the selected grama panchayaths a total of 60 farmers, 30 farmers cultivating Chengalikodan and 30 farmers cultivating Nedunendran, five from each of the selected panchayath (who cultivated at least 200 suckers of Chengalikodan or Nedunendran) were selected by using purposive sampling for the collection of primary data. A sample of eighty consumers (20 each from selected blocks) was selected by using snow ball sampling. The other actors in the value chain, two Swasraya Karshaka Samithies (SKS) of VFPCK, seven wholesalers and sixteen retailers were selected based on information received from field. Thus the total sample consists of 60 farmers and 105 other actors.

3.5 Variables measured

Variables for each objectives were listed out based on the reviews of literatures and also based on experter's opinion. Objectives of the thesis, identified variables and tools for analysis were given in table 3.1.

Table 3.1 Variables and tools used for analysing the objectives

Objectives	Variables	Tools
To map the value chain of nendran variety of banana.	• Core process. • Actors involved. • Flow and volume of products • Information and knowledge and services. • Institutional linkages. • Geographical flow of nendran. • Value addition at different levels.	Value chain mapping tool

	• Constraints faced by actors. • Value chain map matrix.	
To identify and analyse the various chains and actors involved in the value chain.	• Actors profile • Production and productivity of banana. • Cost and income of the actors. • Marketing channels. • Availability of inputs. • Promptness of payment to the actors. • Payment holding period. • Advance sales contract. • Awareness and satisfaction of consumers.	Percentage analysis, Indices, rank order scale, Kruskal walli test and ANOVA.
To analyse the cost and margins involved in the value chain.	• Costs and returns of farmers • Wholesalers • Retailers • Government intervention • Consumers • Price spread • Marketing efficiency	Price spread, marketing cost, marketing efficiency, marketing margin, producer's price, marketing margin of middle men.
To identify the constraints and possible solutions at different levels in the value chain.	• Adequacy of information. • Adequacy of support services. • Availability of appropriate technology. • Adequacy of market.	Indices, Kruskal walli test.

3.6 Data collection

Primary data were collected through pre – tested structured survey schedule from sixty farmers, two SKS of VFPCK, seven wholesalers, sixteen retailers and eighty consumers. Secondary data related to price and product was collected from Krishi Bhavan, SKS, wholesalers and retailers.

3.7 Data analysis

The analytical tools used for analysis of data includes descriptive tools like percentage, Indices, rank order scale, Kruskal wallis test, ANOVA, Price spread, marketing cost, marketing efficiency, marketing margin, producer's price, marketing margin of middle men. The detailed description of the tools used as follows.

3.7.1 Percentage tool

Percentage is number or ratio that represents a fraction of 100. It is often denoted by the symbol "%" or simply as "percent" or "pct".

3.7.2 Kruskal – Wallis test

The Kruskal – Wallis one way analysis of variance by ranks is an extremely useful test for deciding whether the independent samples are from different populations. It will explain whether the differences amongst samples signify genuine population differences or whether they represent merely random samples from the same population. The Kruskal- Wallis test statistic H was computed using the formula.

$$H = \frac{12}{N(N+1)} \sum_{J=1}^{K} \frac{R_j^2}{n_j} - 3$$

Where,

K = Number of samples

n_j = Number of observations in j^{th} sample

$N = \sum n_j$, the number of cases in all samples combined

R_j = Sum of ranks in j^{th} samples.

3.7.3 One – Way Analysis of Variance (ANOVA)

Analysis of variance (ANOVA) technique used to compare the means of more than two populations. ANOVA technique uses F- statistics, which test if the means of the groups, formed by one independent variable or a combination of variables are significantly different. It is based on the comparison of two estimates of variance – one representing within groups, often referred to as error variance and other representing the variance due to difference in group means. If the two variances do not differ significantly, there is no reason to claim that the group means differ. The F- Statistic calculates the ratio between the variance due to difference between groups and the error variance

$$F = \frac{\text{Variance due to difference between groups}}{\text{Error variance}}$$

The larger the F- ratio, the greater is the differences between groups as compared to within group difference between groups as compared to within group differences. If the F- test proves the null hypothesis of no difference between groups to be wrong, multiple comparison test are used to further explore the specific relationship among different groups.

3.7.4 Producer's price

It is the net price received by the farmer at the time of first sale. This is equal to the difference in wholesale price to farmers and sum of marketing cost and value loss during harvesting, transit, and marketing.

3.7.5 Producers share in consumer Rupee

It is the price received by the farmer expressed as a percentage of the retail price.

$$\mathbf{P_s = (P_f / P_r)\, 100}$$

P_s = Producer's share in consumer rupee

P_f = Price received by farmer.

P_r = Retail price.

3.7.6 Marketing margin of a middle man

It is the difference between the total payments (cost + purchase price) and receipts (sale price) of the middle man. The margin of marketing intermediaries includes profits and return, which accrued to them for storage, transportation and the interest on capital.

Middlemen margin = sales price – (Purchase price + marketing cost + loss in value if any)

3.7.7 Marketing cost

Marketing cost refer to cost incurred by producer- seller from point of production up to sale. The cost per Kilogram was worked out by adding different components namely production, transportation, harvesting, marketing and investment cost.

3.7.8 Price spread

Price spread is difference between price received by the producer and price paid by the consumer.

Price spread ($P_{s)} = P_p - P_f$

P_p = price paid by the ultimate consumer.

P_f = Price received by the producer – seller

3.7.9 Marketing margin

Marketing margin is the difference between marketing cost and selling price.

MM = SP - MC

MM = Marketing margin

SP = selling price

MC = Marketing cost.

3.7.10 Modified marketing efficiency (Acharya's method)

It is the ratio of price received by the farmer to marketing cost and marketing margin.

$$\textbf{Modified marketing efficiency (MME)} = \frac{P_f}{MC + MM}$$

P_f = Price received by the farmer

MC = Marketing cost

MM = marketing margin

3.7.11 Problem Indices

Indices were calculated based on Likert scale of summated rating.

$$\textbf{Indices} = \frac{\sum_{i=1} \sum_{j=1} S_{ij}}{\sum \textbf{Max } S_j}$$

I = respondent

J = factor

S_{ij} = total score of the j^{th} factor of i^{th} respondent.

Max sj = maximum score of j^{th} factor.

Intensity of problem was interpreted based on range of Indices score.

Range of score	Interpretation
SD + Mean	Mostly felt
(SD + Mean) between (SD- Mean)	Moderately felt
SD – Mean	Least felt

3.7.12 Rank order scale

To analyse the determinants of consumers for purchasing nendran variety, respondents were asked to rank each reasons in the order of preference. After that marks were assigned to each rank as follows.

For reasons to preference the first rank a weightage of 1 was given and for the 10^{th} rank, weightage assigned was 10 and other weightage were between this range (i.e. for rank 1 to 10, weightage of 1 to 10 were given respectively. Similar methods are followed for analysing the non- preference also. The scores obtained were summed up to arrive the total scores for each reason. So least scores obtained was given first rank and so on. Similarly highest score obtained factor is considered as the less influencing reasons for determinants.

3.7.13 Cost calculation

(a) Concepts of cost

Cost incurred for growing the selected crops are classified under cost A, cost B and cost C and the data analysis of the data made as:

Cost A: All kind of expenses (paid out costs) actually incurred by the cultivators includes:

- Hired human labour
- Animal labour
- Machine labour
- Seed / seedlings
- Farm yard manure and chemical fertilisers
- Plant protection
- Repair and maintenance charges of implement, machinery and buildings
- Other expenses

Cost B1: Cost A + interest on fixed assets (excluding land)

Cost B: Cost B1 + interest on fair value of land

Cost C: Cost B+ imputed value of family labour

(b) Procedure for imputation of values of owned inputs

In the production process, certain inputs from stocks are used. In order to estimate the cost, the value of input used out of home stock is imputed. The procedures used for the imputation of values of such home stock inputs are:

1. Owned seed – farm produced seed has been imputed at the prices prevalent in the investigator zone concerned at the time of sowing.
2. Implements – repair and maintenance charges of implements.
3. Interest on fixed capital – interest on the present value of fixed assets such as land farm, building, implements, and machinery at the rate of 10% per annum has been calculated.

(c) Allocation of costs to different crops

Some of the inputs used for the cultivation of one crop are common for other crops also. For the purpose of computing the cost share of individual crops, the cost of such inputs is apportioned in the following manner.

1. Repair and maintenance charges of implements - In proportion to the area under the crop
2. Interest on fixed capital (excluding land) - In proportion to the area under the crop
3. Interest on land value - Interest on the Fair value of land under the crop

(d) Procedure for valuation of farm assets

1. Own farm buildings (cattle sheds, storage shed etc) - prices prevailing in the locality
2. Implements and other machinery - prevalent market prices
3. Livestock (only draught animals) - prevalent market prices

In calculating the cost of production of each crop in season wise the interest on fair value of land at the rate of 10% per annum is taken in to account.

Based on the methodologies stated above, the objectives of the study were analysed and the results and discussions were presented in the chapter IV.

RESULTS AND DISCUSSIONS

CHAPTER - IV

RESULTS AND DISCUSSIONS

The present study "value chain analysis of banana: Nendran variety in Thrissur district" was aimed to map the value chain of nendran variety of banana, to identify and analyse the various chains and actors involved in the value chain, to analyse the cost and margins in the value chain, and also to identify the constraints and possible solutions at different levels in the value chain to enhance the efficiency. For the purpose of analysing the objectives, pre structured interview schedule were used for each actors in the value chain. The survey was conducted among 60 farmers (30 Changalokodan farmers and 30 Nedunendran farmers), two SKS of VFPCK, seven wholesalers, sixteen retailers and eighty consumers. The analyses of the objectives are presented under the following four heads:

1. To map the value chain of nendran variety of banana.
2. To identify and analyse the various chains and actors involved in the value chain.
3. To analyze the cost and margins involved in the value chain.
4. To identify the constraints and possible solutions at different levels in the value chain to enhance the efficiency.

Session I

4.1 Mapping the value chain of nendran variety banana

Raphael kaplinsky and mike Morris (2001), describes value chain as full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumer and final disposal after use.

Visualisation of network (mapping) always gives better understanding on the relationship between actors and processors. It provided basic overview of the value chain and helps in identifying constraint and possible solutions at different levels. An agriculture value chain starts with farmer producer and ends with consumer. The actor in a value chain are of two types – one who directly involved in the core activities and second, who facilitates the

action of primary stake holders, they are support services providers like information, credit, input, technology etc.

Even though there is no comprehensive method in mapping value chain, the global approach was used to map the value chain better.

The following dimensions were mapped in the present study.

- The mapping of core process in value chain of nendran variety which starts with input supply and ends with consumption.
- Mapping of actors involved in the value chain of nendran variety.
- Mapping of flow and volume of product.
- Mapping of knowledge, information and services in value chain.
- Mapping of linkages in the value chain.
- Mapping of geographical flow of nendran variety.
- Mapping of value addition at different levels.
- Constraints faced by actors.
- Value chain map matrix.

4.1.1 Core process in the value chain of banana can be depicted as follows

Core process is a process with a set of related and interdependent activities that transform an input to a system to an output with added value to a customer. It is the transformation of people, money, materials, or information that is the value – added work of the organisation. The core processes are those processes by which the organization creates its most value added and essential transformation for the customers. The fig 4.1 shows the core process in nendran variety of banana.

Fig. 4.1 Core process in nendran variety of banana value chain

1. Input supply

The basic inputs in nendran variety cultivation are suckers, fertilisers, supporting stick, technology, information, machineries and credit. For input supply, farmers in Ollukkara and kodakara block depended SKS whereas farmers in Wadakkanchery and Pazayannur block depended Krishibhavan. SKS and Krishi Bhavan make available fertilisers to farmers at subsidised rates. Chengalikodan farmers are getting suckers from cultivated banana, whereas, nedunendran farmers depended on local traders for availing suckers for the purpose nendran cultivation. During cultivation period motor pump is the main equipment for irrigation purpose. Farmers are availing credit facility for cultivation under four percent subsidised loan scheme of nationalized bank.

2. Production

The production of nendran variety is undertaken by the whole year continuously and it will be depended upon the geographical nature. The cultivation period started from the month of September - October to till the next year. The production process of nendran involves planting, fertilising, irrigation, and harvesting. As it is a long process it needs full time labour force in the nendran cultivation. For a good yield, planting should be at the correct time with favourable climatic conditions.

3. Procurement

Procurement is the process of finding and agreeing in to terms and acquiring goods and services from an external source often via a tendering or competitive bidding process. Maintain good relationship with suppliers is the inevitable part of nendran production for the farmers. This will help the sustainability of each actor including farmer in the value chain. The bulky nature of the produce forces a farmer to sell their product immediately. The procurement is always carrying mainly at the time of onam season. The major procurement players in the value chain are wholesalers and SKS and they are collecting Chengalikodan and nedunendran respectively.

4. Marketing

Marketing plays a vital role in any business. It is the key research process of researching, promoting and selling products or services to the target market. Without marketing many business would fail to exist. The bottom line of any business is profit. Profit is largely the result of successful sales. It is an important business process where you inform, attract, and convince people that products or services are of value to them. Primarily Nedunendran farmers sold their produce to SKS and Chengalikodan farmers sold to wholesalers and in the next stage the produce distributed through marketing channels and finally nendran varieties reached to end consumers.

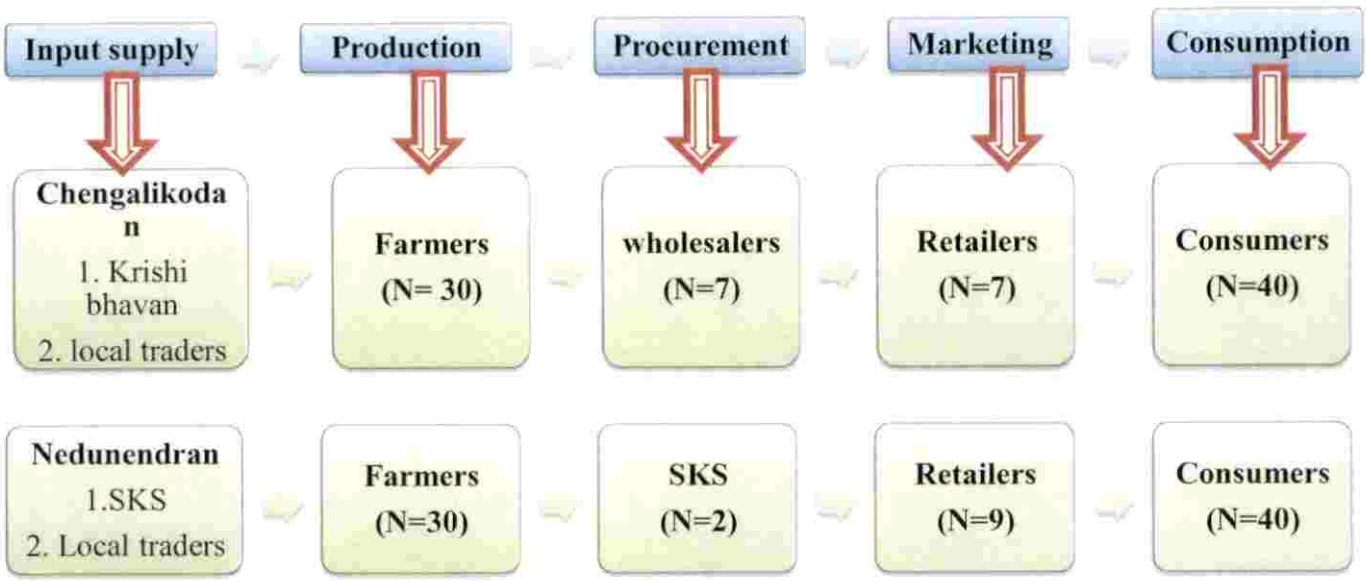
5. Consumption

Nendran banana is a very popular fruit due to its high nutritive value. It is consumed in fresh or cooked form, both as ripe and raw fruit. Through the marketing channels it reaches to the hands of consumers.

4.1.2 Actors involved in the value chain

Actors in a value chain are the people or members from input supply to consumption. The major actors involved in the core process in value chain were given in the fig 4.2.

Fig.4.2 Actors involved in value chain nendran variety of banana

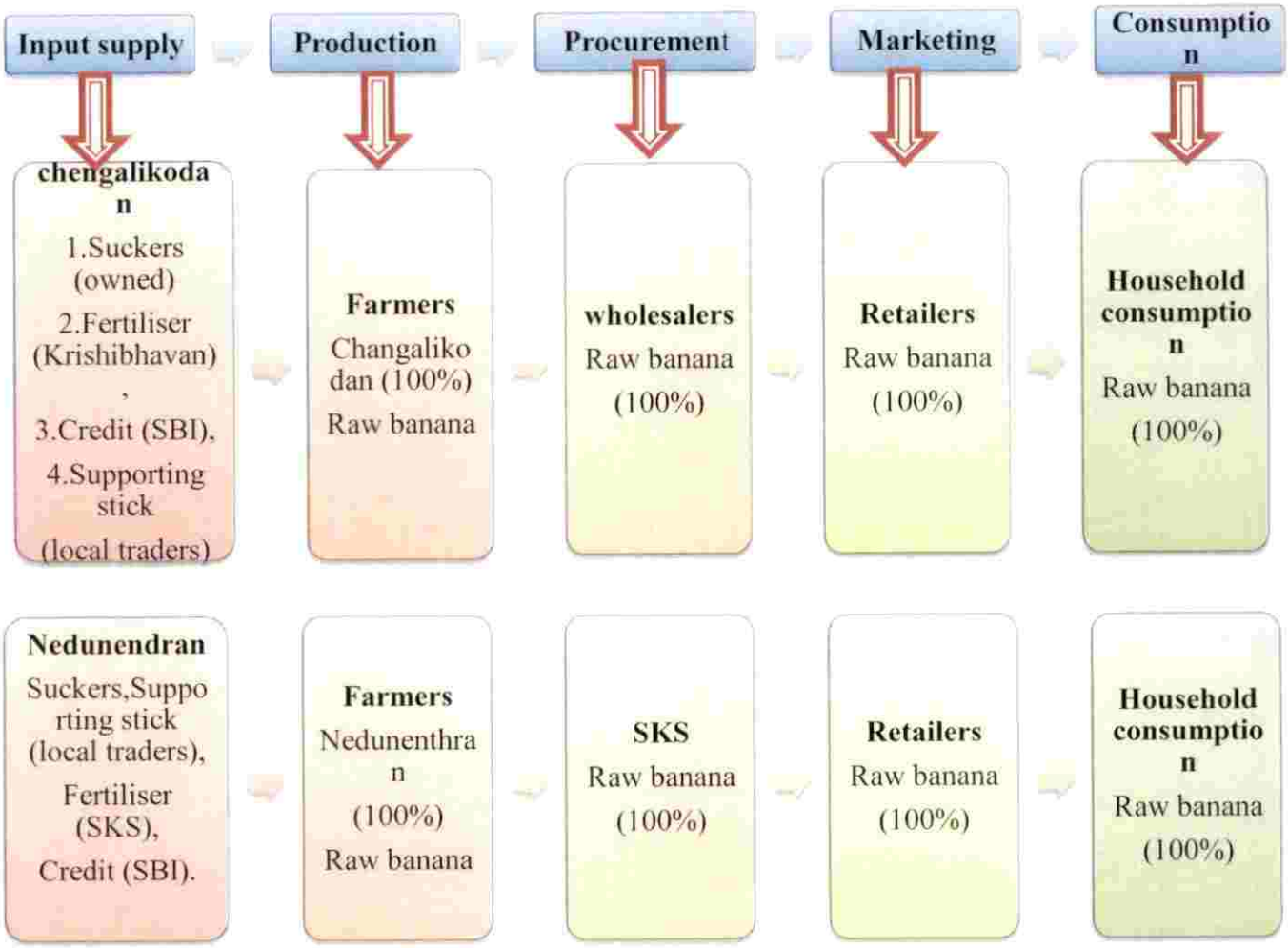


Krishi Bhavan, local traders, farmers, wholesalers, retailers and consumers were the actors in value chain of Chengalikodan, whereas local traders, farmers, SKS, retailers and consumers constitute the major actors in the value chain of nedunendran banana. Sucker, supporting stick, fertilisers, pesticides, technologies, insurance services, and credit were the major inputs needed for banana cultivation. Nedunendran farmers were more depended on SKS for inputs like fertilisers and insurance services at a subsidised rate whereas Chengalikodan farmers depending Krishibhavan for the same. The two varieties were going through marketing channels. Chengalikodan farmers were directly selling their produce to wholesalers. and from there it reaches to retailers. At the same time nedunendran farmers directly sold them to SKS, and they directly sell it to retailers. In addition to marketing SKS act as an input supplier cum procurement actor for nedunendran farmers. After that retailers sold their product to all over the district. This was the routine channel of actors followed by the two nendran variety of banana in surveyed area.

4.1.3 Flow and volume of products in the value chain

The mapping flow and volume of product involves identifying the products at each stage of the process as they are transformed from inputs to raw materials, to intermediate materials and to final products. Mapping these flows creates a clear picture of what forms and volume of products are handled, transformed and transported at each stage of the value chain. The flow and volume of product in nendran banana value chain is given in figure 4.3.

Fig. 4.3 Flow and volume of product in the value chain



From fig 4.3 it is clearly depicted that the Chengalikodan farmers were selling their total produce to the wholesalers and they sold it to the retailers. Then the product moved to the end consumers for household consumption in the form of raw banana.

In case of nedunendran flow of product was similar to Chengalikodan except SKS stands in between farmer and retailer is the sole procurement agency for nedunendran farmers.

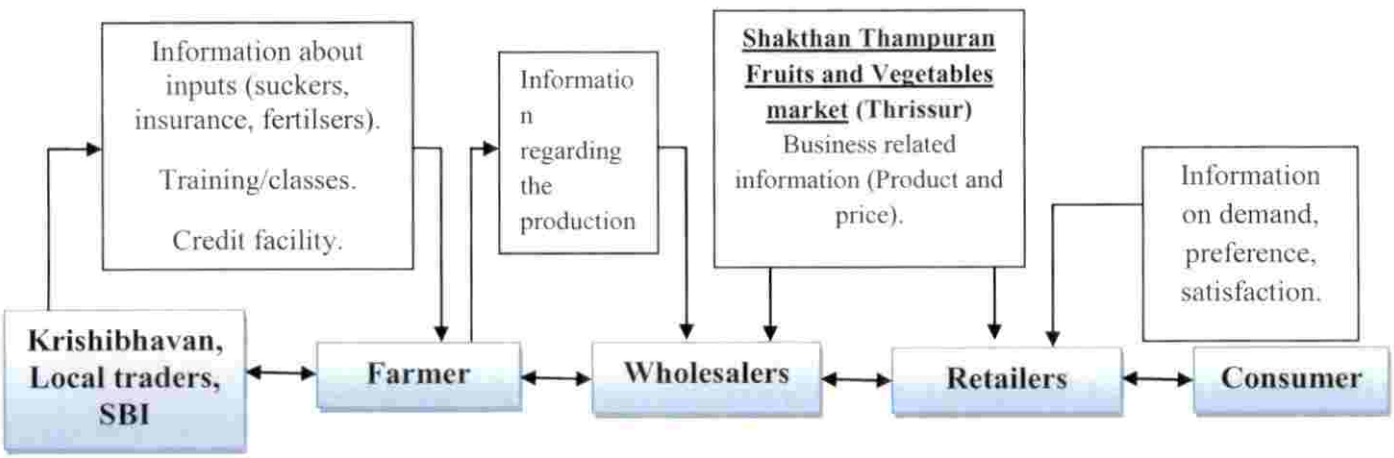
Both Chengalikodan and nedunendran flowed in the form of raw banana only. There was no processor in between wholesaler and retailer; the value addition of nendran was not possible in this value chain.

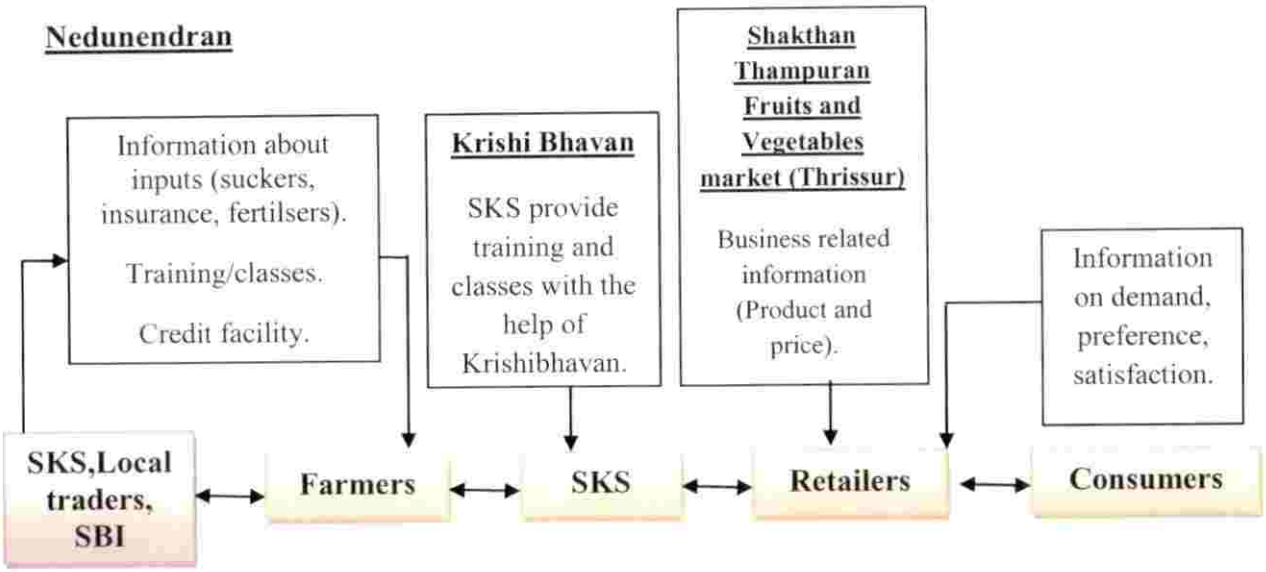
4.1.4 Mapping knowledge, information and services in the value chain of nendran variety

Mapping of information and knowledge flow indicates the information sharing between the chain actors. How the knowledge and information passes through various actors are depicted in fig 4.4.

Fig.4.4 Flow of information, knowledge and services in value chain

Chengalikodan





Krishibhavan was the major source of information for Chengalikodan farmers and SKS for Nedunendran farmers. They were the contact points of Krishibhavan and SKS as well. They disseminate the information about the inputs (Suckers, insurance, fertilisers) to the farmers on time. Both the institutions Krishibhavan and SKS arrange classes and training for farmers at the time of planting. SKS act as an input supplier and procurement agency for nedunendran farmers. The rest of actors (SKS, wholesalers, and retailers) in the Chengalikodan and nedunendran depended on Shakthan Thampuran Fruits and Vegetables market (Thrissur) for collecting business related information about the product and price. Shakthan Thampuran Fruits and Vegetables market (Thrissur) published the rate of nedunendran/Chengalikodan on daily wise. Consumers had a major role in the value chain; they gave the information to the marketers about their demand, preference and satisfaction towards Chengalikodan / nedunendran. Farmers opined that they were not receiving any technical or institutional support from KAU.

4.1.5 Mapping of institutional linkage

Institutional linkage of a farmer represents their level of societal contact. The linkage of a farmer with organizations in value chain is mainly for input supply, information gathering and sharing or for training needs. These linkages with institutions relating to agriculture helps the farmer in adopting better practices in the field as well as for availing benefits and improving cultivation.

Fig.4.5 Institutional linkage of Actors in the value chain

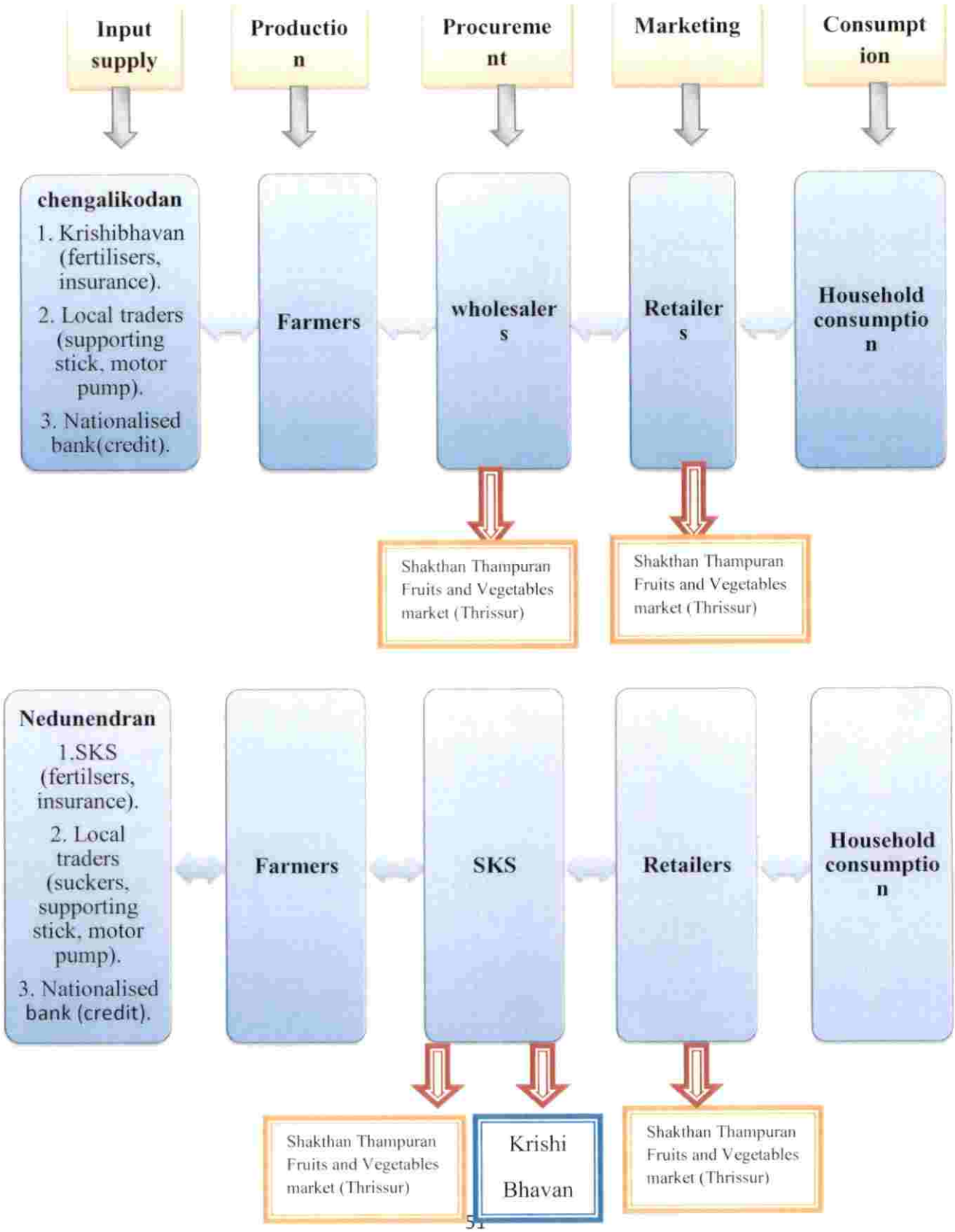
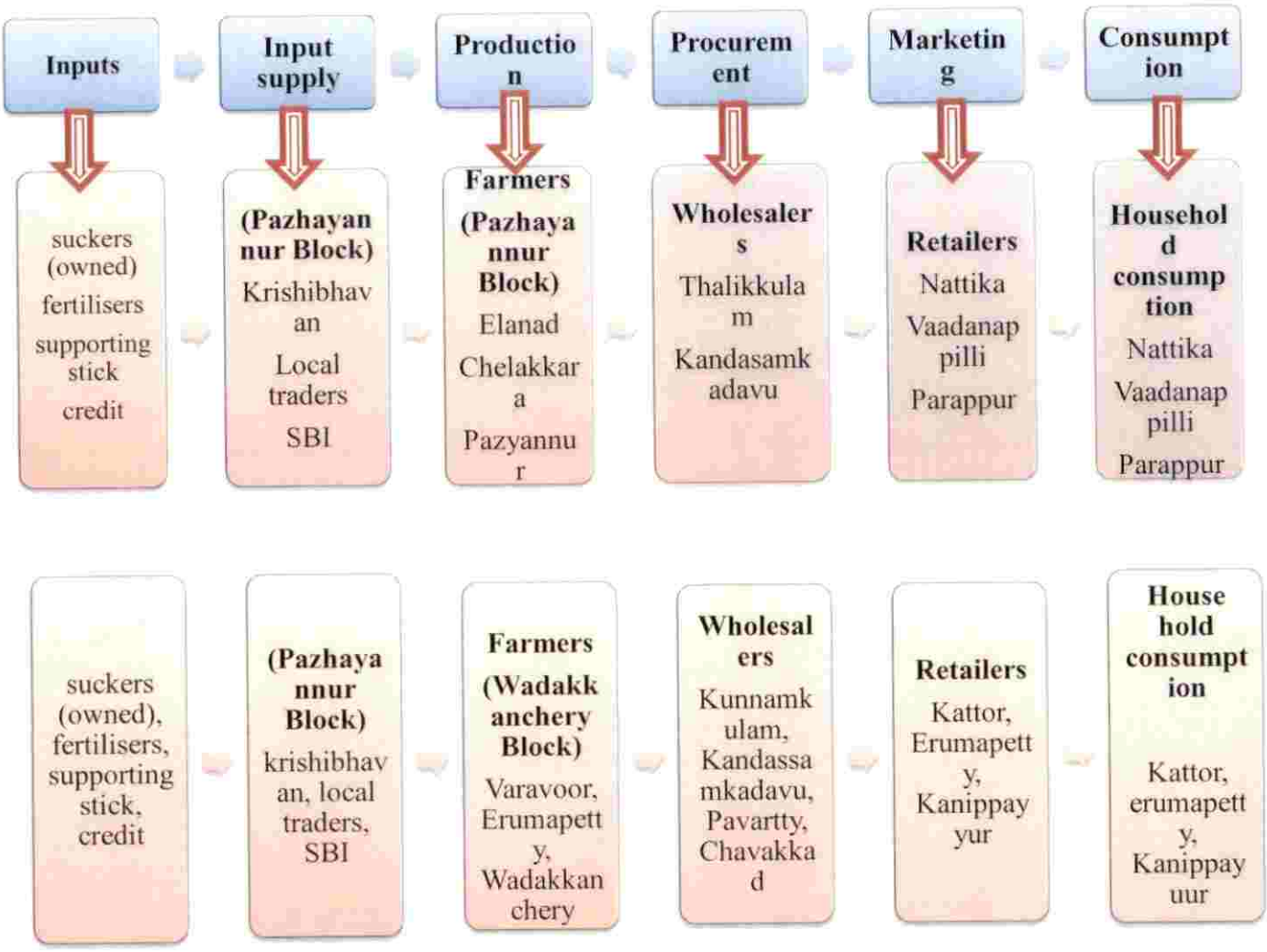


Fig 4.5 illustrates that there were number of institutions that linked with each actors in the value chain. Both Chengalikodan and nedunendran farmers had a timely network relationship with Krishibhavan, SKS and nationalised bank for availing fertilisers, insurance and credit facility for the cultivation period (persistent network relation). Local traders were providing the major inputs like supporting stick and motor pump for the production purpose, and they had spot relationship with farmers. The major source of information related to market price and demand of the product was SKS and wholesalers. These institutions were always keeping a spot market relation with Shakthan Thampuran Fruits and Vegetables market (Thrissur) for collecting up to date information. In addition, SKS linked with Krishi Bhavan for market intelligence. Retailer's major source of information passed from wholesalers, SKS, and Shakthan Thampuran Fruits and Vegetables market (Thrissur). At last the retailers were followed by the end consumers for transferring the ownership of the product (horizontal integration). Both the wholesalers and retailers opined that they were not taking loans from any of the institution. They were using their own capital for the business.

4.1.6 Mapping of geographical flow of nendran banana

Mapping the geographical flow of banana helps to identify the physical location of nendran banana in the value chain and also to identify where the places were located; starting from the place of origin till it reaches the consumer. The production and flow of products in both Chengalikodan and nedunendran reaches in different part of Thrissur district. The geographical flow of both Chengalikodan and nedunendran were showed in figure 4.6 and fig 4.7.

Fig. 4.6 Geographical flow of Chengalikodan



From the above figure 4.6 it was noted that source of input supply was same for farmers in both Pazayannur and Wadakkanchery block. In Pazhayannur block Chengalikodan farmers were mostly from Elanad, Chelakkara, and Pazhayannur panchayath. From these places banana were moved in to Thalikkulam and Kandasamkadavu. After that the retailer from Nattika, Vaadanappilli and Parappur places collected Chengalikodan and sold their itself.

In Wadakkanchery block, the farmers were mainly from Varavoor, Erumapetty, and Wadakkanchery. From these places Chengalikodan were moved in to Kunnamkulam, Kandasamkadavu, Pavartty and Chavakkad. The retailers from Kattor, Erumapetty and Kaanippayyur area took raw banana and sold it to the nearest consumers.

Fig. 4.7 Geographical flow of Nedunendran

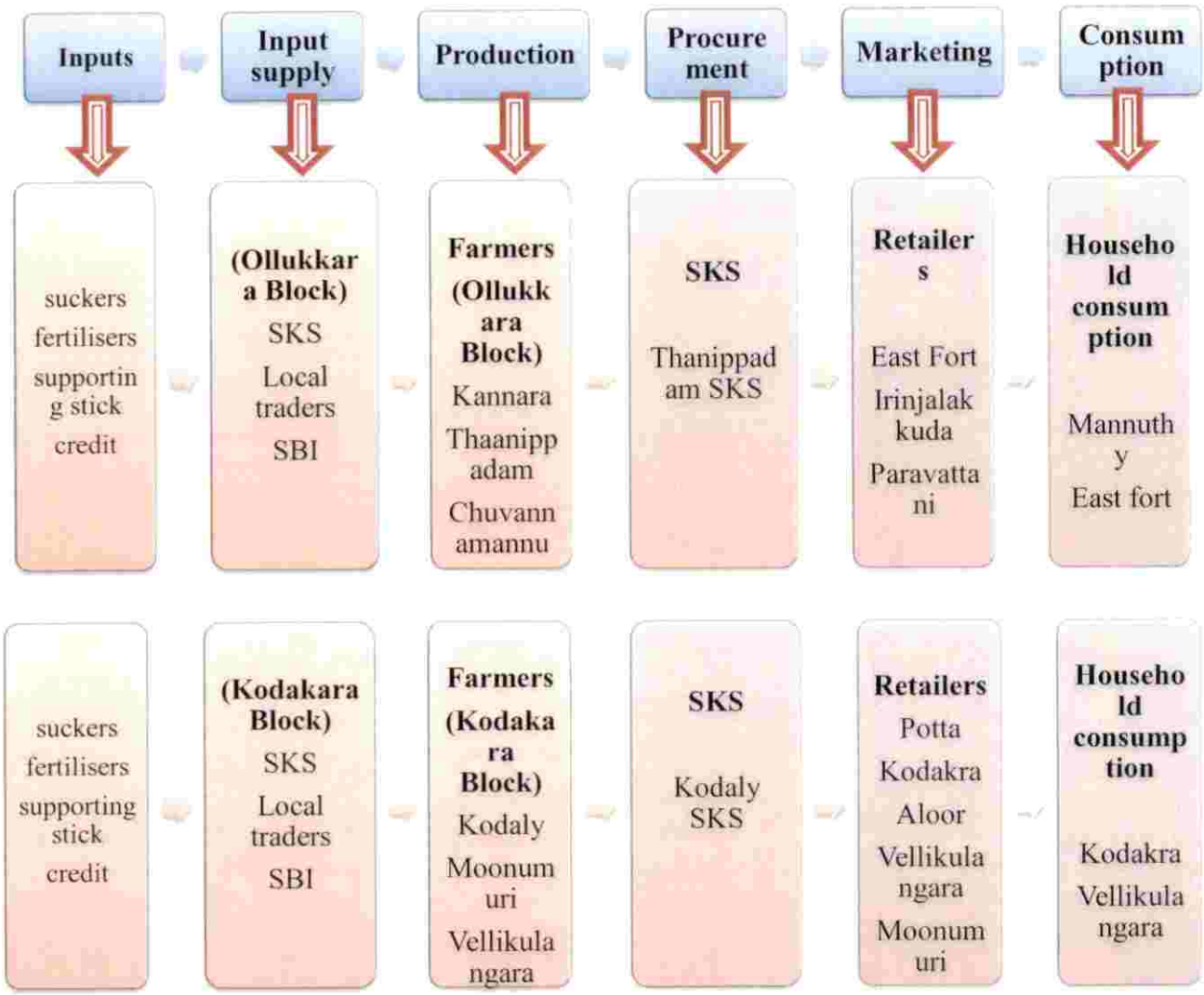


Fig 4.7 showed geographical flow of nedunendran banana. The selected farmers in ollukkara block were from Kannara, Thaanippadam, and Chuvannamannu panchayath. From these places nedunendran farmers sold their produce to Thaanippadam SKS. The retailers from East fort, Irinjalakkuda and Paravattani places collected nedunendran from Thaanippadam SKS and sold it to nearest consumers.

In case of Kodakara block, farmers were selected from Kodaly, Moonumuri, and Vellikulangara panchayath. From these places banana farmers sold their produce to Kodaly SKS. The retailers from Potta, kodakara, Aloor, Vellikulangara, and Moonumuri places were collected nedunendran from Kodaly SKS and sold it to consumers.

It concluded that both Chengalikodan and nedunendran were sold within the various places of Thrissur district, and there was no export activity undertaken by the value chain actors.

4.1.7 Value additions at different levels of value chain

A core element in value chain mapping is to map the monitoring value throughout the chain. The cost incurred from production point till marketing was taken for calculation of cost incurred by farmer. It includes cost of input, cost of labour, machinery, interest on value of owned fixed capital, rent on lease land, rental value on owned land etc. While calculating the margin, investment cost, procurement, transportation, labour, loading / unloading charges, investment cost and sales are considered for all actors in the value chain. Value addition at different levels of the chain is given in figure 4.8.

The major assumptions in cost calculations in the case of farmers, SKS, wholesalers and retailers were as follows:-

- All cost and returns were calculated for kilogram of Chengalikodan / nedunendran marketed. In the case of farmers all cost was actual cost incurred by farmers. The fixed investment in land was considered as rent received on owned land if lend for lease.

For SKS, wholesaler, retailer cost and return are calculated as below:-

- Depreciation on land, weighing machine, and furniture were calculated @ 10 percent.

The two channels of nendran variety of banana for the farmers are:-

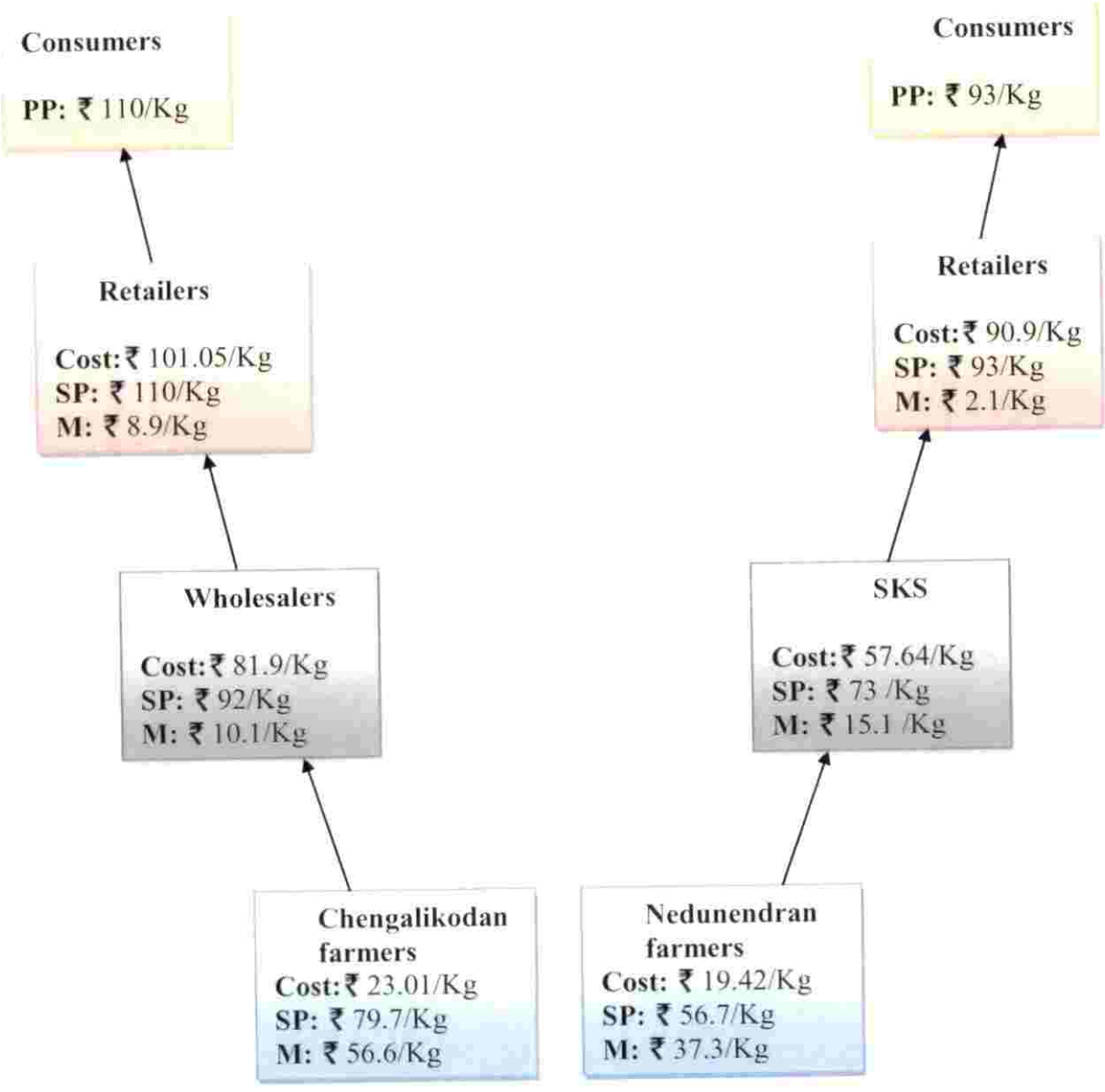
Marketing channel for Chengalikodan

Farmer ⟶ Wholesaler ⟶ Retailer ⟶ Consumer

Marketing channel for Nedunendran

Farmer ⟶ SKS ⟶ Retailer ⟶ Consumer

Fig 4.8 value addition at different levels in the value chain of nendran variety



(The details regarding the cost and margin for each components and actors are analysed and described in session III.)

Fig 4.8 showed that value addition of actors in two types of marketing channels i.e. Chengalikodan and nedunendran. Margin received by two channel actors indicated that the only profitable one was Chengalikodan channel. Farmers get a margin of ₹ 56.6/Kg by selling it to wholesalers. Nedunendran farmers get a margin of ₹ 37.3/kg, were sold it to SKS. All other actors were earning a good margin for their product. Margin of

Chengalikodan actors was very high than nedunendran actors. Farmers got the highest margin from these channels. The value of product is different, because Chengalikodan is well known as Kaazchakula; the rate varied according to the appearances. For nedunendran have no much specification like Chengalikodan, so the margins were different for those two type channels.

4.1.9 Mapping the constraints and possible solutions

Constraints exist in all levels in the value chain and all actors in the value chain also face different constraints. Initial identification of these constraints made from all the actors and also suggested possible solutions are given in the fig 4.9

Fig 4.9 Constraints and perceived solution suggested by actors in the value chain

FARMERS

- **Constraints**
- Attack of pests and diseases
- Natural calamities.
- Price fluctuations.
- Lack of fair prices.
- Lack of owned fund.

Perceived solutions

Provide quality pesticides to farmers through Krishibhavan, SKS, and Kerala Agricultural University or from other government agencies.

SKS

- **Constraints**
- Lack of fair prices.
- Price fluctuation.
- Lack of knowledge about financial system

WHOLESALERS

- **Constraints**
- Price fluctuation.
- Lack of storage facility.
- Lack of quality product.
- Attack of rats, insects, etc.

RETAILERS

- **Constraints**
- Price fluctuation.
- High transportation cost.
- Less shelf life.
- Attack of pests and diseases.

CONSUMERS

- **Constraints**
- Non- availability of required quantity.
- Less shelf life of the product

Perceived solutions

During onam season, supply of banana fails to meet its demand of consumers. This highlights the need to expand the area under cultivation and increase in the production during this season.

4.1.10 Value chain map matrix

A value chain map matrix summarises the key information from the value chain mapping done by using global approach. The value chain map matrix The matrix are given in the below table.

Table 4.1 Value chain map matrix of Chengalikodan

	Input supply	Production	Procurement	Marketing	Consumption
Inputs		Fertilsers, supporting stick, insurance, credit, technology.			
Activities		Planting, irrigation, fertilising, application of insecticides and pesticides, fixing supporting stick, harvesting.	Collection of Chengalikodan, loading/ unloading to the destinations, sells it to retailers.	Loading/ unloading to the destinations, Directly sold it to consumers.	Purchase banana (raw form) for household consumption and to provide as Kaazchakula to Guruvayoor Temple.
Output		Chengalikodan banana	Chengalikodan banana	Chengalikodan banana	Chengalikodan banana
Actors	Krishibhavan Local traders SBI	Farmers	Wholesalers	Retailers	Consumers

Knowledge and information		Krishibhavan Local traders SBI	Shakthan Thampuran Fruits and Vegetables market (Thrissur) (about product and price).	Shakthan Thampuran Fruits and Vegetables market (Thrissur) and wholesalers (about product and price).	Feedback to marketers about demand, preference and satisfaction.
Geographical flow		Elanad, Chelakkara, Pazhayannur, Varavoor, Erumapetty, Wadakkanchery.	Thalikkulam, Kandasamkadavu , Kunnamkulam, Pavartty, Chavakkad.	Nattika, Vaadanappilli, Parappur, Kattor, Erumapetty , Kanippayyur.	Nattika, Vaadanappilli , Parappur, Kattor , Erumapetty, Kanippayyur.
Value additions		Cost: ₹ 23.01/kg SP: ₹ 79.7/kg M: ₹ 56.6/kg	Cost: ₹ 81.9/kg SP: ₹ 92/kg M: ₹ 10.1/kg	Cost: ₹ 101.05/kg SP: ₹ 110/kg M: ₹ 8.9/kg	PP: ₹ 110/kg

Constraints		Attack of pests and diseases, Natural calamities, Price fluctuations, Lack of fair price, Lack of owned fund.	Price fluctuation, Lack of storage facility, Lack of quality of the product, Attack of rats, insects, etc.	Price fluctuation, High transportation cost, Less shelf life, Attack of pests and diseases.	Non-availability of required quantity, Less shelf life of the product.
Perceived solutions suggests by actors		Provide quality pesticides to farmers through Krishibhavan, SKS, and Kerala Agricultural University or from other government agencies.	–	–	During onam season, supply of banana fails to meet demand of consumers. This highlights need to expand the area under cultivation and increase the production during this season.

Table 4.2 Value chain map matrix of nedunendran

	Inputs supply	Production	Procurement	Marketing	Consumption
Inputs		Fertilsers, supporting stick, insurance, credit, technology.			
Activities		Planting, irrigation, fertilising, application of insecticides and pesticides, fixing supporting stick, harvesting.	Collection of nedunendran from farmers.	Loading/ unloading to the destinations, Directly sold it to consumers.	Purchase of banana (raw form).
Output		Nedunendran banana	Nedunendran banana	Nedunendran banana	Nedunendran banana
Actors	SKS Local traders SBI	Farmers	SKS	Retailers	Consumers
Knowledge and information		SKS Local traders SBI	Shakthan Thampuran Fruits and Vegetables market (Thrissur) (about product and price).	Shakthan Thampuran Fruits and Vegetables market (Thrissur) and SKS (about product	Feedback to marketers about their demand, preference, satisfaction.

			Krishibhavan – training/ classes.	and price).	
Geographical flow		Kannara , Thaanippadam, Chuvannamannu , Kodaly, Moonumuri, Vellikulangara.	Thaanippadam SKS Kodaly SKS	East fort, Irinjalakkuda, Paravattani , Potta, Kodakara, Aloor, Vellikulangara, Moonumuri.	Mannuthy, East fort, Kodakara, Vellikulangara.
Value additions		Cost:₹ 19.42/kg SP: ₹ 56.7/kg M: ₹ 37.3/kg	Cost: ₹ 57.64/kg SP: ₹ 73/kg M: ₹ 15.1/kg	Cost: ₹ 90.9/kg SP: ₹ 93/kg M: ₹ 2.1/kg	PP: ₹ 93/kg
Constraints		Attack of pests and diseases, Natural calamities, Price fluctuations, Lack of fair prices, Lack of owned fund.	Lack of fair prices, Price fluctuation, Lack of knowledge about financial system.	Price fluctuation, High transportation cost, Less shelf life, Attack of pests and diseases.	Non-availability of required quantity, Less shelf life of the product.

Perceived solutions suggests by actors		Provide quality pesticides to farmers through Krishibhavan, SKS or other government agencies.			During onam season, supply of banana fails to meet its demand of consumers. This highlights the need to expand the area under cultivation and increase in the production during this season.

The above session mapped the nendran variety of banana including the mapping of actors, flow of products, knowledge and information, institution linkage, constraints faced by each actors and geographical flow of products of both Chengalikodan and nedunendran value chain. The analysis of various chains and actors involved in the value chain is described in session II.

Session II

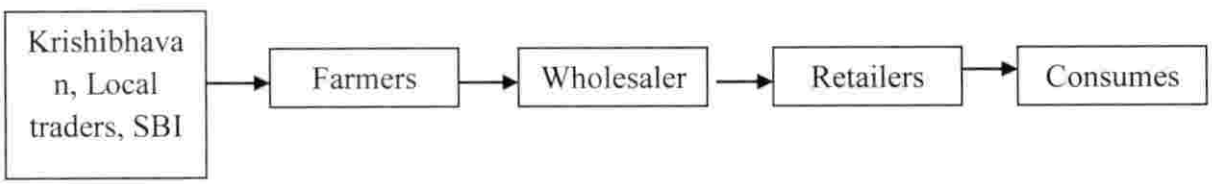
4.2 Various chains and actors involved in the value chain.

This section aimed to attempt the various chains and actors involved in the value chain. A sample of sixty farmers, thirty nedunendran and thirty Chengalikodan were selected purposively from four blocks of Thrissur district. Rest of the actors was surveyed based on the information received from farmers.

4.2.1 Value chains of Nendran variety

Nendran variety passes through various value chains through different actors. In the case of Chengalikodan and nedunendran two marketing channel were identified, one for changalikodan and another for nedunendran.

Marketing channel for Chengalikodan



Marketing channel for Nedunendran

The actors involved in the value chain of Chengalikodan banana were Krishibhavan, local traders, SBI, farmers, wholesalers, retailers and consumers, whereas the actors in nedunendran banana were SKS, local traders, SBI, farmers, SKS, retailers and consumers.

4.2.2 Actors involved in the value chain of Nendran variety

There are number of actors involved in the value chain. A detailed analysis of various chains and actors involved in value chain of both Chengalikodan and nedunendran are given below.

4.2.2.1 Farmer

The base of agriculture in value chain is farmer; they are the supplier of raw material for the next level of activities in value chain. Thus the indirect dependency of other actors to farmer is very high since their business is influenced by them. The sixty farmers from four different blocks Ollukkara, Kodakara, Wadakkanchery and Pazayannur were selected for the study.

4.2.2.1.1 Socio- economic characteristics of farmer respondents

Socio economic status is the measure of economic and social prospects of the individuals. It indicates the social position of an individual with respect to education, occupation, annual family income, and annual income from agriculture. In order to examine the socio- economic characteristics of the respondents, five indicators, viz., age, education, occupation, annual family income, and annual income from agriculture are considered and they are given in the table 4.3.

Table 4.3 Socio – economic characteristics of farmer respondents

Variables	Category	Chengalikodan (30)		Nedunendran (30)	
		Frequency	Percentage	Frequency	Percentage
Gender	Male	30	100	30	100
	Female	0	0	0	0
	Total	**30**	**100**	**30**	**100**
Age	40 – 50	8	27	8	27
	50- 60	10	33	10	33
	60 and above	12	40	12	40
	Total	**30**	**100**	**30**	**100**
Education	Below SSLC	20	67	21	70
	SSLC	5	17	5	17
	Plus two	4	13	4	13
	Degree	1	3	0	3
	Total	**30**	**100**	**30**	**100**
Occupation	Agriculture	30	100	30	100
	Total	**30**	**100**	**30**	**100**
Annual family income (in ₹.)	Below 25000	1	3	1	3
	25000 – 50000	4	13	4	13
	50000 – 100000	20	67	19	63
	Above 100000	5	17	6	20
	Total	**30**	**100**	**30**	**100**
Annual income from agriculture (in ₹.)	Below 25000	1	3	1	3
	25000 – 50000	4	13	4	13
	50000 – 100000	20	67	19	63
	Above 100000	5	17	6	20
	Total	**30**	**100**	**30**	**100**

Source: Compiled from primary data

Table 4.3 revealed that all farmer respondents were under the male category, females were not working in commercial banana cultivation. 40 percent respondents were coming under the age category of 60 and above years. This inferred that old people were more interested in banana farming. Majority of the respondents (67 percent from Chengalikodan and 70 percent from nedunendran) having education below SSLC. Two percent of farmer respondents had education up to graduation were also cultivating the banana. It showed that involvements in banana cultivation by educated peoples were very limited. All the respondents depended on agriculture for their livelihood. Income was another important economic variable which determined the economical status of the respondents as well as the standard of living of the farmers. Around 67 percent of both farmer respondents were earning an annual income in between ₹ 50,000 and ₹ 1,00,000. It means that selected farmers were having a good standard of living.

4.2.2.1.2 Category of farmers

Based on NABARD guidelines, farmers were classified into marginal, small, and large on the basis of land holdings. Farmers having a land holding of less than 1 hectare (2.5 acre) are called marginal farmers, farmers who are having a land holding of 1-2 hectare (2.5 – 5 acre) is coming under the category of small farmers and the farmers who possess a land above 2 hectare (5 acre) is coming under the class of large farmers. The same classification is followed here, total land holding of the farmer is considered for the classification.

Table 4.4 Category of farmers

Category	Chengalikodan	Nedunendran	Total
Marginal farmers	11(37)	11 (37)	22 (37)
Small farmers	13 (43)	15 (50)	28 (47)
Large farmers	6 (20)	4(13)	10 (16)
Total	**30 (100)**	**30 (100)**	**60 (100)**

*figures in parenthesis indicate percentage to total
Source: Compiled from primary data

Table 4.4 revealed that 47 percent of farmers belonged to small farmer category, followed by marginal (37 percent) and large (16 percent) farmers. Due to favourable

production condition and high demand of nendran the farmers were cultivating banana in more area.

4.2.2.1.3 Area, production, productivity of Chengalikodan and nedunendran

Total area under cultivation of Chengalikodan farmers was 43.92 acres and for nedunendran farmers area was 49 acres out of which 10 acres were leased land. The details of area under cultivation of nendran variety by Chengalikodan and nedunendran farmers and its production and productivity details are given in table 4.5.

Table 4.5 Area, production, productivity of Chengalikodan and Nedunendran

Particulars	Chengalikodan (owned) in acre		Nedunendran (owned) in acre		Nedunendran (lease) in acre	
	Total	Average	Total	Average	Total	Average
Area under nendran cultivation	41.25 (95%)	1.38	26 (68%)	0.951	10	3
Production (Kg)	388500	9418.1	292975 (Total) 8138.1 (Average)			
Productivity (Kg)	6849.0		5765.76			

Source: Compiled from primary data

It was clearly depicted that 95 percent of total area under cultivation was used by Chengalikodan farmers for cultivation, whereas nedunendran farmers used only 68 percent of area for cultivating nendran. Farmers produced 388500kg Chengalikodan banana annually, and 292975 kg by nedunendran farmers. The reason behind that favourable geographic condition and high fertility of soil was more appropriate for Chengalikodan in Wadakkanchery and Pazayannur blocks than ollukkara and Kodakara block.

4.2.2.1.4 Experience of farmers in banana farming

The experience in farming was an important aspect to be examined in the field of agriculture. Higher the experience higher would be the knowledge in farming practices

and knowledge regarding the recent trends in agriculture. Table 4.6 presents the farming experience in banana farming.

Table 4.6 Experience of farmers in banana farming

Variables	Category	Chengalikodan (30)		Nedunendran (30)	
		Frequency	Percentage	Frequency	Percentage
Years of experience	20 – 30	4	13	4	13
	30 – 40	6	20	5	12
	40 – 50	14	47	15	37
	Above 50 years	6	20	6	20
	Total	**30**	**100**	**30**	**100**

Source: Compiled from primary data

Table 4.6 inferred that most of the respondents from Chengalikodan farmers (47 percent) and nedunendran farmers (37 percent) were having 40 to 50 years of experience, followed by 20 percent farmers who had above 50 years of experience in farming. So it was clear that old generation was more experienced in doing banana farming.

4.2.2.1.5 Reason for selection of nendran variety of banana

In order to examine the reason for selection of nendran banana variety among respondents, five indicators, viz., high market value, low cost of cultivation, increasing demand, high yield, and resistance to pest and diseases were considered and they are given in the table 4.7.

Table 4.7 Reason for selection of nendran variety of banana

Particulars	Chengalikodan (30)		Nedunendran(30)	
	Frequency	Percentage	Frequency	Percentage
High market value	2	7	5	17
Low cost of cultivation	0	0	4	13
Increasing demand	4	13	6	20
High yield	20	67	10	33
Resistance to pest and diseases	4	13	5	17
Total	**30**	**100**	**30**	**100**

Source: Compiled from primary data

Table 4.7 Inferred that high yield was the major reason for choosing Chengalikodan by the farmers presiding in Wadakkanchery and Pazayannur block. Compared to nedunendran, farmers get 20 to 25 kg for one Chengalikodan bunch. Increased demand and resistance to pest and diseases were other reasons pointed out by the farmers (13 percent each). In the case of nedunendran farmers high yield and increasing demand were the major reasons for choosing nedunendran. The other reasons were high market value, low cost cultivation, and resistance to pest and diseases.

4.2.2.1.6 Production and marketed surplus of nendran varieties of banana

Marketed surplus represents the portion of total production of the farmer, which was actually disposed of by him in the market, after self consumption. The details regarding the total production of farmers and their marketed surplus in the surveyed area were explained in table 4.8.

Table 4.8 Production and marketed surplus of nendran varieties of banana

Category	Total production (kg)	Marketed surplus (₹)
Chengalikodan (N=30)	388500	30986000
Nedunendran (N=30)	292975	16621125

*Figure in parenthesis indicates percentage to total production in respective varieties.
Source: Compiled from primary data

Table 4.8 showed the production and marketed surplus of both Chengalikodan and nedunendran. The both farmers were not using these varieties for self consumption. The cultivated banana was completely sold in the market with a total value of₹ 30986000 and ₹16621125 for Chengalikodan and nedunendran respectively.

4.2.2.1.7 Marketing channels of nendran variety of banana from farmers

Marketing channels of nedunendran and Chengalikodan are shown in Table 4.9.

Table 4.9 Marketing channels of nendran variety of banana from farmers

Channel of marketing	Chengalikodan (N=30)	Nedunendran(N=30)
SKS	0	30 (100)
Wholesalers	30 (100)	0
Total	**30 (100)**	**30 (100)**

*figures in parenthesis indicate percentage to total
Source: Compiled from primary data

The Table 4.9 revealed that Chengalikodan farmers (100 percent) used to sell this variety directly to wholesalers and nedunendran farmers (100 percent) sold it to SKS. It was observed that because of high price of Chengalikodan and high demand they directly sold it to wholesalers. Nedunendran farmers sold their produce to nearest SKS outlets. They were having reluctance to sell that in Thrissur market, due to the high wastage and damage of the product due to the careless handling while unloading the product.

4.2.2.1.8 Sources of information to the farmers

Information regarding input supply insurance, fertilisers and credit facilities necessary for farmers to produce and market their produce effectively. For this purpose they are seeking information from different sources and the details are given in table 4.10.

Table 4.10 Source of information to the farmers

Particulars	Categories	SKS	Krishibhavan
Chengalikodan (N=30)	Information on inputs, insurance, fertilisers.	0	30 (100)
	Classes / training	0	30 (100)
Nedunendran (N=30)	Information on inputs, insurance, fertilisers.	30 (100)	0
	Classes / training	30 (100)	0

*figures in parenthesis indicate percentage to total
Source: Compiled from primary data

The only source of information for nedunendran farmer was SKS. As all the farmers were members of SKS so it was easy to avail the information regarding input supply,

fertilisers, insurance, training and classes from this institution whereas Chengalikodan farmers were seeking information from Krishi Bhavan.

4.2.2.1.9 Institutional linkage of farmers

Farmers are linked with so many institutions for the purpose of production and marketing of nendran. The details regarding the institution linkages are given below.

Table 4.11 Institutional linkage of farmers

Institution	Nature of linkage	Chengalikodan (N=30)	Nedunendran (N=30)
Krishibhavan	Fertiliser at subsidised rate, training / classes, insurance services.	30 (100)	0
SKS	Fertiliser at subsidised rate, Training/ classes, insurance services.	0	30 (100)
Banks	Bank loan for account purpose.	13(43)	16(53)
Local traders	Purchase of suckers Purchase of supporting stick.	0 30 (100)	28(93) 30 (100)

*figures in parenthesis indicate percentage to total.
Source: Compiled from primary data

Farmers cannot do cultivation without the help of institutions. Chengalikodan farmers (100 percent) depended on Krishibhavan for insurance services, training/ classes, and also fertilsers. Nedunendran farmers (100 percent) approached SKS for availing these services. Farmers were borrowing agricultural loans from nationalized bank @ 4% interest rate. For purchase of supporting stick, nedunendran farmers and Chengalikodan farmers were depending on local traders. In the case of suckers, Chengalikodan farmers

were used self produced suckers for the cultivation. But for the nedunendran farmers they were connected with local traders for purchasing suckers.

4.2.2.1.10 Time required for price realisation

Farmers are investing their owned and borrowed money in nendran cultivation by expecting an immediate return. In the studied area, Chengalikodan farmers sold their product directly to wholesalers. Nedunendran farmers sold their product directly to SKS. The farmers had to wait one week to two weeks for realisation of return from both wholesalers and SKS. The other actors SKS, wholesalers, and retailers run business on an adjustment with each other. Therefore the time required for price realisation is not affecting their business.

4.2.2.1.11 Advance sales contracts

No actors took advance sale contract from farmers.

4.2.2.2 Swasraya Karshaka Samithi (SKS)

SKS is the most important actor and plays a role in procurement of value chain. SKS act as an outlet of (Vegetable and Fruits Promotion Council Keralam) VFPCK. The both SKS were selected from Ollukkara and Kodakara block. The organisational profile of ollukkara and kodakara block SKS is shown in the table 4.12.

Table 4.12 Organisational profile of Ollukkara and Kodaly SKS

Particulars	Ollukkara SKS	Kodaly SKS
Name and address	Swasraya karshaka samithi, Paananchery.	Swasraya karshaka samithi, Kodaly.
Year of establishment and Registration No.	1998 – Reg. No.184/2001.	1998- Reg. No. 198/2001.
Area of operation	Paananchery panchayath.	Mattathur panchayath.
No. of members	Active members:- 193 Non –active members :-71	Active members:- 150 Non –active members :-100
Members fee	Rs.1000. yearly paid Rs. 25	Rs.1000. yearly paid Rs. 25
Inputs provided by SKS	Cow dung, goat manure, dolomite, poultry waste, lime, and pseudomonas.	Cow dung, goat manure, dolomite, poultry waste, lime, and pseudomonas.
Procurement list of vegetables and fruits	**Vegetables:** Cauliflower, yarm, tapioca, Cow pea, amaranths, cucumber, pumpkin, chilly, ash guard, bitter guard. **Fruits:** Jack fruit, mango, pine apple, njali poovan, kadali, karppora valli, robusta, podikunnan, chara poovan nedunendran.	**Vegetables:** Cow pea, amaranths, cucumber, pumpkin, chilly, ash guard, bitter gurad. **Fruits:** Pineapple, mango, mangostine, nedunendran, poovan, njali, kannan.

Ollukkara block SKS called Swasraya Karshaka Samithi which exists in Paananchery panchayath. They opened their office in 1998 and it started functioning from 2001 onwards with the register no.184/2001. Area of operation is ollukkara block which includes active and non- active members of different panchayaths like Kannara, Thaanippadam, Vilangannur, peechi, ollukkara, pattikad etc.

Kodakara block SKS, named as Swasraya Karshaka Samithi which exists in Kodaly panchayath. They opened their office in 1998 and it started functioning from 2001 onwards with the register no.198/2001. They covered area viz., Vellikulangara, kodakara, Moonumuri, Mattathur, Kodaly, puli thara, kadambod, murikkangal, Thaanippadam, maan kutty paadam etc.

Both SKS collecting ₹ 1000 from members as a membership fee and also they paid ₹ 25 as a part of fee annually. They provide fertilisers like Cow dung, goat manure, dolomite, poultry waste, lime, and pseudomonas at a subsidised rate. SKS procured vegetables like Cauliflower, yarm, tapioca, Cow pea, amaranths, cucumber, pumpkin, chilly, ash guard, bitter guard, and also fruits, like Jack fruit, mango, pine apple, njali poovan, kadali, karppora valli, robusta, podikunnan, chara poovan nedunendran, mangostine, and kannan from farmers. They provide facilities like; 1)₹ 20,000 given to the family of died member who acts as a member in the society. 2) Bonus of 3percent of profit given to active members who brought farm products of ₹15,000 in a year.

SKS procured banana from farmers at ₹ 57/kg. SKS sold Nedunendran banana to retailers near to the blocks. The product was sold on the basis of current market rate. The survey consisted of two SKS, Ollukkara and Kodakara block. SKS procure nedunendran bananas from these farmers with a commission at five percent (For example: For amount of ₹ 100 then farmers would only receive ₹ 95. Commission at ₹ 5 would be taken for activities of SKS).

4.2.2.2.1 Marketing channels of Nedunendran banana from SKS

SKS (Thaanippadam and Kodaly) sold nedunendran directly to retailers. SKS procured Nedunendran Bananas from the farmers with a commission of 5% and they sold it to retailers with additional of 5 percent. SKS cannot afford all cost of transportation and

handling of banana to sell it in the Shakthan Thampuran Fruits and Vegetables market (Thrissur).

4.2.2.2.2 Source of information to the SKS

SKS collected source of information related to product and price from Shakthan Thampuran Fruits and Vegetables market (Thrissur).

4.2.2.2.3 Institutional linkage of SKS

It is observed that they are providing various training, classes and workshops for farmers with the support of Krishibhavan.

4.2.2.2.4 Procurement details of SKS

Farmers sell their whole produce (292975kg) to SKS with ₹ 56.7/kg. The purchased products SKS sell directly to retailers for ₹ 73/kg.

4.2.2.2.5 Time required for price realisation

In the studied area, SKS sell their product directly to retailers. SKS had to wait one week to two weeks for realisation of return from retailers.

4.2.2.2.6 Advance sales contract

No advance sales contract with any actors in value chain.

4.2.2.3 Wholesalers

Wholesalers are the secondary intermediary involved in value chain of Chengalikodan banana. Seven wholesalers from Thrissur district were selected based on the information received from farmers. The table shows the details of wholesalers.

Table 4.13 Organisational profile of wholesalers (Chengalikodan)

Variables	Category	Frequency	Percentage
Gender	Male	7	100
	Female	0	0
	Total	**7**	**100**
Age	40 – 50	2	29
	50- 60	4	57
	60 and above	1	14
	Total	**7**	**100**
Education	Below SSLC	2	28
	SSLC	2	29
	Plus two	2	29
	Degree	1	14
	Total	**7**	**100**
Occupation	Business	7	100
	Total	**7**	**100**
Ownership	Individual	**7**	**100**
	Total	**7**	**100**
Investment	Own fund	7	100
	Total	**7**	**100**
Monthly income (in ₹.)	100000 – 200000	0	0
	200000 – 300000	1	14
	300000 – 400000	2	29
	Above 400000	4	57
	Total	**7**	**100**

Source: Compiled from primary data

The wholesaler respondents were under the male category. Majority of the wholesalers (57 percent) were under 50-60 age category. 29 percentage were under 40-50 age category, and rest of wholesalers (14 percent) were above 60 age category. Most of the wholesalers education was below SSLC and Plus two. Only 14 percentage wholesaler

education was degree. They were individual owners and also invested their own fund to business. Majority of wholesaler respondents (57 percent) had monthly income of above ₹ 400000. 29 percentage of wholesaler respondent's monthly income was in between ₹ 300000-400000. Rest of respondents' income was in between from ₹ 200000-300000.Wholesalers procured Chengalikodan bananas directly from farmers and sold it to retailers. The wholesalers sold Chengalikodan directly to retailers on a certain percentage of margin and retailers in turn sold it directly to customers.

4.2.2.3.1 Marketing of Chengalikodan banana by wholesalers

The selected wholesalers procured Chengalikodan directly from farmers annually. They sold Chengalikodan directly to retailers. There was no processor in any other intermediaries of actors.

4.2.2.3.2 Sources of information to the wholesalers

The Chengalikodan wholesaler's collects information related to product and price from Shakthan Thampuran Fruits and Vegetables market (Thrissur). The up to date information on price were updated by Shakthan Thampuran Fruits and Vegetables market (Thrissur) daily.

4.2.2.3.3 Institutional linkage of wholesalers

An institution does not exist independently; it depends on other institutions directly or indirectly. Wholesaler is not an exception – they also collected information regarding price and other marketed related information from Shakthan Thampuran Fruits and Vegetables market (Thrissur).

4.2.2.3.4 Procurement details of wholesalers

The selected wholesalers procured 75 percent of total production (292100 kg) in the year 2016.-2017 directly from farmers with ₹ 79.7/kg. They directly sold their 100 percent of the procured product to retailers.

4.2.2.3.5 Time required for price realisation

In the studied area, wholesalers sold their product directly to retailers. Wholesalers had to wait one week to two weeks for realisation of payment from retailers.

4.2.2. 3.6 Advance sales contract

No advance sales contract with any actors in Chengalikodan value chain.

4.2.2.4 Retailers

Retailers were the people who involved in the business of daily consumable items. It was the basic format designed to supply to the needs of end consumer. They never stocked more than threshold limit which was required in the business. Seven Chengalikodan retailers and nine Nedunendran retailers were surveyed for the purpose of study. The table shows the combined details of retailers.

Table 4.14 Organisational profile of Retailers

Variables	Category	Chengalikodan (N=7)		Nedunendran (N=9)	
		Frequency	Percentage	Frequency	Percentage
Gender	Male	7	100	9	100
	Female	0	0	0	0
	Total	**7**	**100**	**9**	**100**
Age	30 – 40	1	14	1	11
	40 - 50	4	57	3	33
	50- 60	2	28	4	44
	60 and above	0	0	1	11
	Total	**7**	**100**	**9**	**100**
Education	SSLC	5	71	5	55
	Plus two	2	29	4	44
	Total	**7**	**100**	**9**	**100**
Occupation	Business	7	100	9	100
	Total	**7**	**100**	**9**	**100**
Ownership	Individual	7	100	9	100
	Total	**7**	**100**	**9**	**100**
Investment	Own fund	7	100	9	100
	Total	**16**	**100**	**9**	**100**
Monthly income (in ₹.)	10000 – 20000	0	0	3	33
	20000 – 30000	5	71	4	44
	30000 – 40000	2	29	2	22
	Above 40000	0	0	0	0
	Total	**7**	**100**	**9**	**100**

Source: Compiled from primary data

The table 4.14 revealed that majority of the Chengalikodan respondents (57 percent) belonged to 40-50 age category whereas 44 percent of nedunendran respondents were between 50-60 age category. Majority of the retailers (71 percent of Chengalikodan and 55 percent of nedunendran) were having educational qualification of SSLC and rest of

them was plus two. They had individual ownership and also invested their own fund to business. 71 percent of Chengalikodan and 44 percent of nedunendran retailer's monthly income was in between ₹20000-30000.

4.2.2.4.1 Sale of nendran variety by retailers

The retailers sold Chengalikodan and nedunendran directly to ultimate consumers. During onam season consumers were purchased bunch of Chengalikodan and nedunendran from retailers.

4.2.2.4.2 Sources of information to the Chengalikodan and nedunendran retailers

The Chengalikodan retailers collected information related to product and price from Shakthan Thampuran Fruits and Vegetables market (Thrissur) and wholesalers whereas, nedunendran retailer's collected information related to product and price from Shakthan Thampuran Fruits and Vegetables market (Thrissur) and SKS also.

4.2.2.4.3 Institutional linkage of Chengalikodan and nedunendran retailers

The Chengalikodan retailers were contacting wholesalers and Shakthan Thampuran Fruits and Vegetables market (Thrissur) for information related to product and price. They got the up to date information from Shakthan Thampuran Fruits and Vegetables market (Thrissur) whereas, nedunendran retailers approached SKS and Shakthan Thampuran Fruits and Vegetables market (Thrissur) for the same.

4.2.2.4.4 Procurement details of Chengalikodan and nedunendran retailers

Chengalikodan retailers procured 49750kg (17 percent) directly from wholesalers with ₹ 92/kg. Nedunendran retailers procured 11020 kg (22 percent) directly from SKS with₹ 73/kg

4.2.2.4.5 Time required for price realisation

In the studied area, both Chengalikodan and nedunendran retailers sold their product directly to consumers. The retailers had to depend on consumers for spot payment.

4.2.2.4.6 Advance sales contract

No advance sale contract with any actors in value chain.

4.2.2.5 Consumer

Nowadays consumers play an important role in the creation of the value chain. Consumer is the key figure in the value chain and their needs and opinions will affect the supplier's decisions. Retailers are changing the way they operate based on the customers they serve.

Table 4.15 Socio economic characteristics of consumer

Variables	Category	Chengalikodan (N=40)		Nedunendran (N=40)	
		Frequency	Percentage	Frequency	Percentage
Age	30-40	9	22	9	22
	41-50	15	37	14	35
	51-60	16	40	16	40
	61-70	0	0	1	2
	Total	**40**	**100**	**40**	**100**
Sex	Male	30	75	40	100
	Female	10	25	0	0
	Total	**80**	**100**	**40**	**100**
Education	SSLC	5	12	5	12
	Plus Two	9	22	8	20
	Degree	22	55	21	53
	PG	4	10	6	15
	Total	**40**	**100**	**40**	**100**
Occupation	Govt. Employee	15	37	17	43
	Business	17	43	14	35
	Others	8	20	9	22
	Total	**40**	**100**	**40**	**100**
Annual income	Less than 50,000	0	0	4	10
	Rs. 50,000 – 1,50,000	16	40	12	30
	1,50,000 – 2,50,000	20	50	15	37
	Above 3,00,000	4	10	9	23
	Total	**40**	**100**	**40**	**100**

Source: compiled from primary data

Table 4.15 revealed that most of the respondents (both) (40 percent) were in 51 to 60 age category. Among Chengalikodan consumers 75 percent were male and 25 percent were females whereas nedunendran consumers (100 percent) were from male category.

Majority of the respondents (53 percent) education qualification was degree. They were highly educated people. With regard to the occupation of Chengalikodan and nedunendran respondents (43 percent and 35 percent) were doing business. 36 percent of respondents' occupation was govt. employees. The rest of respondents (21 percent) were under other category. Income was another important economic variable which determined the economical status of the respondents as well as the standard of living of the consumers. 50 percent of the Chengalikodan respondents were earning an annual income was in between ₹ 1,50,000 to ₹ 2, 50,000.

Table 4.16 Banana purchasing details of consumers

Variables	Category	Chengalikodan (N=40)		Nedunendran (N=40)	
		Frequency	Percentage	Frequency	Percentage
Form of purchasing nendran	(vegetable, fruit) All	40	100	40	100
Total		**40**	**100**	**40**	**100**
Season for purchasing	(on season and off season) Both	40	100	40	100
Total		**40**	**100**	**40**	**100**
Place of purchasing	Direct from farmer	5	12	5	12
	Wholesalers	4	10	0	0
	Retailers	31	78	35	88
Total		**40**	**100**	**40**	**100**
Periodicity of purchasing nendran	Twice in a week	15	37	20	50
	Weekly	25	63	20	50
Total		**40**	**100**	**40**	**100**

Source: Compiled from primary data

The table 4.16 inferred that 100 percent respondents purchased nendran in all forms, at the same time they purchased nendran in on season and off seasons. Everyone does the

payment through cash. Majority consumers of both Chengalikodan and nedunendran (78 percent and 88 percent) were purchasing nendran from retailers. 10 percent and 12 percent purchased nendran from wholesalers and direct from farmers. Majority of the Chengalikodan and nedunendran respondents (63 percent and 50 percent) bought nendran in weekly and the remaining respondents purchased twice in a week.

4.2.2.5.1 Awareness of consumers towards value added products from banana

Awareness about a product among the consumers is the prerequisite for the successful marketing. The level of awareness may vary with the product type and consumer characteristics, educational level, occupation, personal characteristics of the consumer etc. conventional and non - conventional source of information, distribution of outlets of the products, promotional activities by the marketers etc. which can influence the awareness creation among the consumers. The below table shows consumer is how much aware about the value added products of banana.

Indices range defining awareness towards VAP of banana

	Total
Fully aware	Greater than 98
Partially aware	78 – 98
Least aware	Less than 78
Standard Deviation	10
Mean	88

Table 4.17 Awareness of consumers towards value added products from banana

Statements	**Total (80)**		
	Score	**Indices**	**Indices range**
Banana chips	240	**100**	**FA**
Pazampori	240	**100**	**FA**
Nendran powder	240	**100**	**FA**
Dried banana	185	77	LA
Banana pulp	196	82	PA
Banana wine	198	82	PA
Composite score / Indices	**1273**	**88**	**PA**

Source: Compiled from primary data

Analysis of Table 4.17 revealed that eighty respondents were fully aware about banana chips, pazampori and nendran powder. They always purchased chips and pazampori as snacks to home. They were partially aware about banana pulp, and banana wine. The respondents heard about these products, but were not fully aware of these products. They were not at all aware about dried banana.

4.2.2.5.2 Determinants of purchasing Chengalikodan / nedunendran

Determinants refers that a factor which decisively affects the nature or outcome of something. While purchasing product, consumers checked in to so many things especially in food items.

Table 4.18 Determinants of purchasing Chengalikodan / nedunendran:

Determinants	Chengalikodan		Nedunendran		Total	
	Score	Rank	Score	Rank	Score	Rank
Price	442	2	421	3	863	**2**
Freshness	396	3	426	2	822	**3**
Nutrient value	258	7	290	6	548	6
Hygiene	261	6	236	9	497	8
Taste	443	1	441	1	884	**1**
Organic nature	249	8	249	8	498	7
Easy to prepare	290	5	327	4	617	**5**
More calories	220	11	221	10	441	10
Family preference	357	4	301	5	658	**4**
Snack	227	10	253	7	480	9
Health concern	158	12	168	12	326	12
Local grown	108	13	98	13	206	13
Convenient to use	231	9	209	11	440	11

Source: Compiled from primary data

Here the table 4.18 revealed that what are the factors they are considering before purchasing Chengalikodan and nedunendran. Consumers ranked taste as the first determinant for purchasing nendran followed by price, freshness, family preference and easy to prepare. If consumers get fresh nendran they are ready to pay premium price also. Consumers were not considering the factors like convenient to use, health concern and locally grown nature of banana while buying.

4.2.2.5.3 Attitude of consumers towards Chengalikodan / nedunendran

Consumer's attitude is an expression of inner feelings that reflect whether a person is favourably or unfavourably predisposed to some objects. Attitude research forms the basis for developing new products, repositioning the existing products, creating advertising campaigns and predicting product preference as well as purchase behaviour. Understanding how attitudes influence a consumer's purchase behaviour to the success of any marketing programme.

As a part of analysing, the attitude of the consumers towards Chengalikodan/ nedunendran was studied. The eight statements thus selected were it was less perishable, nutritious compared to other fruits, chemical free, believes that origin from locally grown, convenient to use, less time to purchase, eating fruits in each day is enjoyable, taste is good, it is an appetizer. Selecting five point likert scale, namely highly favourable, moderately favourable, no specific opinion, moderately unfavourable, and highly unfavourable the data were analysed. The details are given below.

Indices range defining attitude of consumers towards Chengalikodan / Nedunendran

	Chengalikodan	Nedunendran	Total
Highly favourable (HF)	Greater than 96	Greater than 98	Greater than 98
Moderately favourable (MF)	90-96	91-98	91-98
No specific opinion (NSP)	78-90	77-91	77-91
Moderately unfavourable (MUF)	72-78	70-77	70-77
Highly unfavourable (HUF)	Less than 72	Less than 70	Less than 70
Standard Deviation	6	7	7
Mean	84	84	84

Table 4.19 Attitude of consumers towards Chengalikodan / nedunendran

	Chengalikodan (40)		Nedunendran(40)		Total (80)	
Statements	**Score**	**Indices**	**Score**	**Indices**	**Score**	**Indices**
It is less perishable.	163	81 (NSP)	161	80 (NSP)	324	81 (NSP)
It is nutritious compared to other fruits.	173	86 (NSP)	182	90 (NSP)	355	89 (NSP)
These varieties are chemical free.	143	71 (HUF)	137	68 (HUF)	280	69 (HUF)
Believes that origin from locally grown.	154	79 (NSP)	152	78 (NSP)	306	76 (MUF)
Convenient to use.	168	84 (NSP)	168	84 (NSP)	336	84 (NSP)
It needs less time to purchase.	176	88 (NSP)	174	87 (NSP)	350	87 (NSP)
These varieties taste is good.	181	**91 (MF)**	182	**91 (MF)**	363	**91 (MF)**
It is an appetizing.	172	86 (NSP)	177	88 (NSP)	349	87 (NSP)
Composite score / Indices	**1330**	**84**	**1331**	**84**	**2661**	**84**

*(HF- highly favourable, MF- moderately favourable, NSP – no specific opinion, MUF – moderately unfavourable, and HUF – highly unfavouarble)

Table 4.19 discovered that consumers of both Chengalikodan and nedunendran banana were moderately favourable towards taste of banana. Consumers showed no specific opinion attitude towards less perishable, nutritious compared to other fruits, believes in origin from locally grown, convenient to use, needs less time to purchase, and it is an appetizing feature. Regarding the chemical content of banana, consumers were unfavourable. Consumers never believed that it cannot be grown without application of chemicals.

ANOVA

For testing whether there is any difference in between attitude of consumers towards Chengalikodan and nedunendran, ANOVA method is undertaken in the table 4.20.

Table 4.20 Attitude of consumers towards nendran varieties – ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.548	1	1.548	.040	**.842**
Within Groups	3034.477	78	38.904		
Total	3036.025	79			

Result of ANOVA showed that there was no difference in the attitude of consumers regarding Chengalikodan and nedunendran.

4.2.2.5.4 Satisfaction of consumers towards Chengalikodan / Nedunendran

Consumer satisfaction defined as it is a measure of how products and services supplied by a company to meet customers expectation. It depends on the balance between customer's expectations and experiences with the products and services. The only theme of the study was to know satisfaction towards Chengalikodan and nedunendran of consumers. For data analysis selected a 5 point scale of Highly satisfied, Moderately satisfied, resigned, Moderately dissatisfied, and Highly dissatisfied were used. The details are given below.

Indices range defining satisfaction of consumers towards Chengalikodan /Nedunendran

	Chengalikodan	Nedunendran	Total
Highly satisfied (HS)	Greater than 91	Greater than 96	Greater than 91
Moderately Satisfied (MS)	86 – 91	90 – 96	86 – 91
Resigned (R)	76 – 86	78 – 90	76 – 86
Moderately dissatisfied (MDS)	71- 76	72 – 78	71 – 76
Highly dissatisfied (HDS)	Less than 71	Less than 72	Less than 71
Standard Deviation	5	7	5
Mean	81	82	81

Table 4.21 Satisfaction of consumers towards Chengalikodan / Nedunendran

	Chengalikodan (40)		Nedunendran(40)		Total (80)	
Statements	**Score**	**Indices**	**Score**	**Indices**	**Score**	**Indices**
Price	159	79 (R)	159	79 (R)	318	79 (R)
Taste	170	85 (R)	174	87 (R)	344	85 (R)
Nutrient value	167	83 (R)	174	87 (R)	341	85 (R)
Freshness	169	84 (R)	170	85 (R)	339	85 (R)
Hygiene	166	83 (R)	165	82 (R)	331	83 (R)
Availability	167	83 (R)	164	82 (R)	331	83 (R)
Chemical, pesticide free	144	72 (MDS)	133	66 (MDS)	277	69 (MDS)
Shelf life	162	81 (R)	168	84 (R)	330	82 (R)
Composite score / Indices	**1304**	**81**	**1307**	**82**	**2611**	**81**

*(HS- Highly Satisfied, MS- Moderately Satisfied, R- Resigned, MDS- Moderately Dissatisfied, HDS- Highly Dissatisfied)

Table 4.21 clearly depicted that Chengalikodan and nedunendran consumers had resigned stage in respect to price, taste, nutrient value, freshness, hygiene, availability and shelf life of the nendran banana as it changed every time. Consumers were moderately dissatisfied with chemical/ pesticide free of both Chengalikodan and nedunendran. Even

though organic manures were used in nendran cultivation, high level usage of chemicals and pesticides made the nendran variety as inorganic in nature.

ANOVA

For testing whether there is any difference between satisfaction of consumers towards Chengalikodan and nedunendran, ANOVA method is undertaken in the table 4.22.

Table 4.22 Satisfaction of consumers towards nendran varieties – ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.703	1	.703	.024	**.878**
Within Groups	2314.844	78	29.677		
Total	2315.547	79			

Analysis of variance results indicates that Chengalikodan and nedunendran were similar with respect satisfaction of consumers towards purchase of nendran.

4.2.2.6 Krishibhavan

The major inputs of nendran cultivation were fertilisers and technologies. Krishibhavan provided fertilisers to farmers at subsidised price. The main fertilisers used for nendran variety cultivation were urea, potash, dolomite, lime, poultry waste, goat manure and cow dung. The farmer got fifty percent subsidy on urea and potash. For each bag (150kg) of dolomite, lime, poultry, goat manure, cow dung a farmer was charged only ₹ 300,120, 190,150,170. These supports from Krishibhavan were based on availability of the inputs with them.

4.2.2.7 Local traders

Machineries, supporting stick, nedunendran suckers were the inputs availed by the farmers from local traders. Local traders supply two types of supporting stick like bamboo and choola of ₹ 100 and ₹ 80 respectively.

4.2.2.8 State Bank of India

Farmers depended on nationalised bank for financial inputs. They normally avail loans under Kissan Credit Card scheme which is revolving at subsidy rate of four percent. The major financial input in the studied area was State Bank of India.

In this session was made to attempt the various value chain and activities are undertaken by selected actors. The detailed analyses of cost, margins of each actor are explained in session III.

Session III

4.3 Cost and margins involved in the value chain of nendran variety of banana

Agriculture marketing plays vital role in the development of agriculture sector of the economy. "Agricultural marketing comprises of all the operations and the agencies conducting them, involved in the movement of farm produced goods, raw materials and their derivatives, such as textiles from the farm to the consumers and the effect of such operations on farmers, middle men and consumers"(Source: http://ecoursesonline.iasri.res.in/) Marketing is critical for better performance in agriculture as farming itself. Improvement in farming system should be aimed for the development of farmer and consumer and all other members involved in between. A better marketing system will help both the producer as well as marketing side in development. In all kind of marketing there exists multiple means for selling a product. These are described as marketing channels. A marketing channel is defined as the vehicle of marketing system, the unit within which all marketing activity takes place. It includes combination of agencies between the movements of product from producers to consumers.

The efficiency of these marketing channels can be better understood from market efficiency indicators. For this price spread and modified market efficiency Indices put forward by Acharya's method (2004) has been used.

Price spread (PS) represents the difference between the net price received by the product – seller (PNP) and the price paid by the ultimate consumer (PR).

PS = RP – PNP

Acharya's method suggests that market efficiency is the ratio received by the farmer to marketing cost and margin. A higher ratio signifies higher efficiency.

In this section an attempt is made to explain the marketing cost, marketing margin and price spread efficiency of nendran banana in Thrissur district.

4.3.1. Cost of cultivation of nendran variety of banana

The cost of cultivation of nendran banana was calculated by using ABC concept (Report on Cost of Cultivation of Important Crops in Kerala 2015-16). The different components of cost was analysed in the research.

4.3.1.1 Cost of inputs in nendran variety cultivation incurred by farmers

Farmers are the first level producer of nendran banana so he needs to carry out the major cost. The details of input cost, transportation cost and marketing cost are given below:

Table 4.23 Cost involved for inputs incurred by farmers

Particulars	Chengalikodan (₹ / Kilogram)	Nedunendran (₹ / Kilogram)
Imputed land cost	0.95 (4.84)	0.79 (4.3)
Leased land rent	0	0.32 (1.75)
Imputed suckers	1.85 (9.4)	0.06 (0.32)
Purchased suckers	0	1.35 (7.40)
Fertilisers	5.0 (25.4)	4.42 (24.2)
Support stick	6.11 (31.1)	6.54 (35.8)
Hired labours	0.44 (2.24)	0.46 (2.52)
Insurance	0.01 (0.050)	0.25 (1.37)
Machinery	1.66 (8.46)	1.40 (7.67)
Maintenance charge	0.10 (0.50)	0.10 (0.54)
Credit (interest on loan)	3.49 (17.7)	2.54 (13.9)
Total cost	**19.61**	**18.23**

*figures in parenthesis indicated percentage to total cost.
Source: compiled from primary data

The table 4.23 showed that the major cost incurred by Chengalikodan farmers were supporting stick (₹ 6.11/kg), fertilisers (₹ 5.0/kg), credit (₹3.49/kg) and machinery (₹ 1.66/kg). The inputs were inevitable for Chengalikodan cultivation so the farmers were ready to pay any amount for purchase of inputs. All the farmers had their own land; and the imputed cost of land and suckers were calculated in the table also.

In the case of nedunendran farmers were having the cost like supporting stick (₹6.54/kg), fertilsers (₹4.42/kg), credit (₹2.54/kg), machinery(₹1.40/kg) and purchased suckers (₹

1.35/kg). Only less cost for imputed suckers (₹0.06/kg) and maintenance charge (₹ 0.10/kg) incurred by nedunendran farmers.

Comparing the cost of both Chengalikodan and nedunendran, Chengalikodan farmers incurred ₹ 19.61/kg than nedunendran farmers ₹18.23/kg. Maintenance of bunch that involved the labour charge was high for Chengalikodan farmers that lead to high cost.

Table 4.24 Cost involved in transportation of inputs incurred by farmers

Particulars	Chengalikodan (₹ / kilogram)	Nedunendran (₹ / kilogram)
Suckers	0	0.06 (20.6)
Fertlisers	0.14 (73.2)	0.04 (13.7)
Supporting stick	0.051 (26.7)	0.19 (65.5)
Total	**0.19**	**0.29**

*figures in parenthesis indicated percentage to total cost.
Source: compiled from primary data

From table 4.24 it could be noticed that transportation of suckers, fertlisers, supporting stick involved the cost. Chengalikodan farmers had to pay only the transportation cost of fertilsers and supporting sticks. Farmers they used their own suckers for cultivation so they did not pay for it. In the case of nedunendran farmers the total cost spend for transportation of inputs was ₹0.29/kg than Chengalikodan.

Comparing these two varieties transportation cost for inputs was higher in nedunendran than Chengalikodan due to the dependency of local traders for purchase of suckers.

Table 4.25 Marketing cost incurred by farmers

Particulars	Chengalikodan (₹ / Kilogram)	Nedunendran (₹ / Kilogram)
Transportation cost	2.02 (62.9)	0.90 (100)
Loading cost / unloading cost	1.19 (37)	0
Total	**3.21**	**0.90**

*figures in parenthesis indicated percentage to total cost.
Source: compiled from primary data

From the Table 4.25 it could be found that transportation and loading/ unloading were considered as main components in marketing. The marketing cost was higher in Chengalikodan farmers rather than nedunendran farmers. The high cost for Chengalikodan because of distance to market and loading/unloading charges. For nedunendran farmers they were not using hired labour for loading and unloading purpose. The cost of procurement and marketing by next level actors – SKS, wholesalers, and retailers were given in the following sessions.

4.3.1.2 Cost incurred by SKS for nedunendran banana

SKS is free from all the other cost except investment cost. The investment cost of SKS was land and building, electricity bill, furniture, and weighing machine. The details are given in the table 4.26.

Table 4.26 Investment cost incurred by SKS (nedunendran)

Particulars	Cost (₹/ Kilogram)
Land and building rent	0.76 (80.6)
Electricity bill	0.013 (1.38)
Furniture	0.09 (9.5)
Weighing machine	0.079 (8.3)
Total	**0.942 (100)**

*figures in parenthesis indicated percentage to total cost.
Source: compiled from primary data

Table 4.26 showed that the higher cost for SKS was mainly attributed by land and building, followed by furniture, weighing machine and electricity bill. The total investment cost incurred by SKS was ₹ 0.942/kg. SKS only incurred by investment cost because farmers bear the cost of loading/ unloading charges to reach their produce and also retailers were bearing the marketing cost for nedunendran.

4.3.1.3 Cost incurred by wholesalers for Chengalikodan banana

Wholesalers are the next actor after Chengalikodan farmers. The details of the different types of cost incurred by the wholesalers are given in the following tables.

Table 4.27 Investment cost incurred by wholesalers (Chengalikodan)

Particulars	Cost (₹ / Kilogram)
Land and building rent	0.085 (5.27)
Electricity bill	0.010 (0.62)
Furniture	0.195 (12.11)
Weighing machine	0.67 (41.6)
Total	**0.96 (100)**

*figures in parenthesis indicated percentage to total cost.
Source: compiled from primary data

The table 4.27 showed the investment cost incurred by Chengalikodan wholesalers. The higher cost for Chengalikodan wholesalers were mainly attributed by weighing machine, followed by furniture, land and building rent and electricity bill. The total investment cost incurred by wholesalers was ₹ 0.96/kg.

4.3.1.3.1. Procurement cost incurred by wholesalers

The procurement cost of a wholesaler included transportation and labour. The only cost a wholesaler incurred during purchase of Chengalikodan was labour of loading/ unloading charges (₹.0.65 per kg).

4.3.1.3.2 Marketing cost incurred by wholesaler

In wholesale business the marketing cost was labour charge (for sales) (₹ 0.68/kg). Wholesalers were not incurring any cost for promotion.

4.3.1.4 Cost incurred by retailers for Chengalikodan and nedunendran banana

Retailers were responsible for reaching the product to the end customers. The cost of retailers could be classified in to two i.e. investment cost and procurement cost.

Table 4.28 Investment cost incurred by retailers

Particulars	Chengalikodan (₹./ Kilogram)	Nedunendran (₹./ Kilogram)
Room rent	0.140 (7.6)	1.35 (18.75)
Electricity bill	0.028 (1.52)	0.157 (2.18)
Furniture	0.62 (33.7)	1.77 (24.5)
Weighing machine	0.81 (44.0)	2.37 (32.9)
Total	**1.598 (100)**	**5.647 (100)**

*figures in parenthesis indicated percentage to total cost.
Source: compiled from primary data

The table 4.28 revealed that majority of the total cost spent for weighing machine by both Chengalikodan (44 percent) and nedunendran (32.9 percent) retailers. Nedunendran retailers held more weighing machine than Chengalikodan retailers. Cost of furniture also took a major portion of total investment cost for retailers of Chengalikodan (33.7 percent) and nedunendran (24.5 percent).

Comparing both retailers, retailers of nedunendran was spending more investment cost than retailer of Chengalikodan. It was due to the weighing machine component.

Table 4.29 Marketing cost incurred by retailers

Particulars	Chengalikodan (₹ / Kilogram)	Nedunendran (₹ / Kilogram)
Labours (for sale)	0.24	1.55
Transportation	7.0	9.2
Labour (loading /Unloading)	0.22	1.56
Total	**7.46**	**12.35**

*figures in parenthesis indicated percentage to total cost.
Source: Compiled from primary data

Marketing cost includes labour cost (for sale), transportation and loading/ unloading cost. The retailers of nendran variety incurred high cost for transportation (₹7/kg and ₹9.2/kg) than labour costs.

Consolidated table of costs and margins of all actors are presented in table 4.30.

Table 4.30 Total marketing cost and margin of actors in Chengalikodan and nedunendran channels

Particulars	Channel for Chengalikodan ₹/ kilogram	Channel for Nedunendran ₹/ kilogram
1. Farmer		
a) Production cost	19.61	18.23
b) Transportation cost	0.191	0.29
c) Transportation cost for marketing	3.21	0.90
Total cost	**23.011**	**19.42**
Selling price for farmer	**79.7**	**56.7**
Margin per Kg	**56.6**	**37.3**
2. SKS		
a) Investment cost		0.942
b) Purchase price		56.7
Total cost		**57.642**
Selling price for SKS		**73**
Margin per Kg		**15.1**
3. Wholesaler		
a) Purchase price	79.7	
b) Purchase cost	1.33	
c) Investment cost	0.96	
Total cost	**81.99**	
Selling price for wholesalers	**92**	
Margin per Kg	**10.1**	
4. Retailer		
a) Purchase price	92	73
b) Purchase cost	7.46	12.35
c) Investment cost	1.598	5.647
Total cost	**101.05**	**90.9**
Selling price for retailers	**110**	**93**
Margin per Kg	**8.9**	**2.1**

Source: compiled from primary data

Table 4.30 showed that farmers received ₹ 56.6/kg margin from Chengalikodan, for the sale of banana to the wholesalers. When the wholesaler sold their same product to next actor retailer, after meeting their total cost like purchase price, purchase cost and investment cost. Wholesaler's earned ₹ 10.1/kg as a margin from sale. Retailers purchased from wholesalers for ₹ 92/ kg, and sold it to consumers for ₹110/kg at the time of onam season, and received an amount of ₹8.9/kg, as margin after meeting their expenses.

Nedunendran farmers received high margin of ₹ 37.3/kg compared to the other actors in the value chain. SKS, who was the next actor, procured nedunendran from farmers at ₹ 56.7/kg. The subsequent player in the nedunendran was retailers. They directly procured from SKS to ₹ 73/kg, their total cost including investment price and purchase price. Retailers sold it to consumers of ₹93/kg. Their margin was limited to ₹ 2.1/kg after meeting their all expenses.

There was a considerable difference in margin received by Chengalikodan farmers (₹ 56.6/kg) and nedunendran farmers (₹37.3/kg). Comparing the channel of Chengalikodan and nedunendran, Chengalikodan farmers were receiving more margin from sale. The reason behind that, Chengalikodan was a popular nendran variety in Kerala. This variety was cultivated in the largest part of Wadakkanchery and Pazayannur block and also it was a GI product. The taste, quality, appearances were good for this variety which helped them to get premium price for the product and it was widely available in onam season. All the intermediate actors between farmer and consumer earned a profit margin. Wholesalers received a margin of ₹10.1/ kg and SKS ₹15.1/kg whereas; retailers earned a margin of ₹ 8.9 per kilogram and ₹ 2.1 per kilogram for Chengalikodan and nedunendran respectively. Overall it was clear that Chengalikodan was more profitable than nedunendran cultivation.

4.3.2 Price spread and marketing efficiency of nendran banana

Price spread is the difference between price paid by consumers and the net price received by the producer for an equivalent quantity of farm produce. Marketing efficiency is the ratio of price received by farmer to marketing margin and cost. The efficiency indicates overall performance of the marketing channel.

There are two types of channels of marketing in the studied area as given below:-

Marketing channel for Chengalikodan

Farmer ⟶ Wholesaler ⟶ Retailer ⟶ Consumer

Marketing channel for Nedunendran

Farmer ⟶ SKS ⟶ Retailer ⟶ Consumer

Table 4.31 Producers share in consumer rupee of each actors in Chengalikodan and nedunendran value chain

Particulars	Chengalikodan		Nedunendran	
	Channel for Chengalikodan ₹ /Kilogram	Channel of Chengalikodan - producer share in consumer rupee	Channel of nedunendran ₹/ kilogram	Channel for nedunendran - producer share in consumer rupee
Producers net price	79.7	72.45	56.7	61.09
Cost incurred				
a) Producer	23.01	20.8	19.42	20.97
b) VFPCK	-	-	0.942	1.01
c) Wholesaler	2.29	2.08	-	-
d) Retailer	9.02	8.2	17.99	19.38
Total cost	**34.32**		**38.35**	
Margin earned				
a) Farmer	56.6	51.4	37.3	40.1
b) VFPCK	-	-	15.1	16.2
c) Wholesalers	10.1	9.18	-	-
d) Retailer	8.9	8.09	2.1	2.26
Total margin	**75.6**		**54.5**	
Consumer price	**110.0**	**100**	**92.8**	**100**

Source: Compiled from primary data

Table 4.31 showed that high net price was earned by the marketing channel of Chengalikodan banana (₹.79.7/kg) whereas nedunendran farmers received ₹.56.7/kg. The farmers earned a margin in terms of producers share in consumers Rupee of ₹ 51.4/kg at the same time wholesalers earned ₹ 9.18/kg, and retailers earned ₹ 8.09/kg.

In the case of nedunendran channel farmers earned a margin in terms of producers share in consumer rupee of ₹ 40.1/kg at the same time VFPCK earned ₹16.2/kg, and retailers earned ₹ 2.26/ kg.

We also noticed that all the actors involved in Chengalikodan and nedunendran had a higher margin than the actors involved in the nedunendran.

Table 4.32 Price spread and Marketing efficiency Indices of Chengalikodan and nedunendran channels

Particulars	Channel of Chengalikodan (₹/ Kilogram)	Channel of Nedunendran (₹/ Kilogram)
Price received by farmer	79.7	56.7
Price paid by the consumer	110.0	92.8
Price spread	**30.3**	**36.1**
Marketing cost	34.32	38.35
Marketing margin	75.6	54.5
Marketing efficiency	**0.72**	**0.61**

Source: Compiled from primary data

Marketing margin is the total margin received by the all actors in the respective channels and marketing cost includes cost incurred for production cost, transportation, marketing, and investment of actors. It could be noted from the table that Chengalikodan channel was more efficient. As the number of actors increased the total cost of marketing also increased in turn reducing market efficiency. It could be concluded that marketing efficiency was higher in Chengalikodan than nedunendran.

The cost and margin of each actors in both Chengalikodan and nedunendran value chain were explained in the above session. The session IV identifies the constraints faced by each actors in value chain.

Session IV

4.4 Constraints and possible solutions at different levels in the value chain.

Agriculture production normally faces lot of constraints especially in production and marketing. In this section an attempt and was made to identify the constraints faced by the each actors in the value chain. The listed variables were finalized based on the experter's opinion and from variables reviewing related topics. The data were collected in three point scale and analysed with the help of indices and Kruskal Wallis test to know the agreement between the statements.

4.4.1 Constraints faced by farmers

Farmers are the prime actors in the value chain of nendran variety. While carrying out the production and marketing activities, the farmer faces a lot of constraints such as attack of pest and diseases, natural calamities etc. the following section attempted toidentify major constraints faced by farmers in nendran cultivation and is presented in the table.

Indices range defining constraints faced by farmers

	Chengalikodan (N=30)	**Nedunendran(N=30)**
Mostly felt	Greater than 98	Greater than 93
Moderately felt	79 -97	78 –92
Least felt	Less than 78	Less than 77
Standard Deviation	10	8
Mean	88	85

Table 4.33 Constraints faced by farmers

Particulars	Chengalikodan (N=30)		Nedunendran (N=30)		H	Assym. Sig
	Score	Indices	Score	Indices		
Lack of availability of labour	90	**100**	67	78		
Lack of availability of sucker	30	51	79	85	5.0**	.024
Inadequate credit	64	75	49	50		
Attack of pest and diseases	88	**98**	90	**100**	3.9**	0.64
Lack of irrigation facilities	90	**100**	53	60		
Effect of climate change	90	**100**	67	78		
Natural calamities	90	**100**	90	**100**	4.16**	.041
Price fluctuations	75	83	75	83		
Lack of fair price	83	94	80	86		
High transportation cost	90	**100**	41	47	21.3**	.000
Lack of owned fund	77	85	73	80	14.6**	.000
Delay in cash realization	90	**100**	57	63		
Attack of animals (monkey, elephant, wild pig)	90	**100**	30	42	52**	.000
Composite score / Indices	**1072**	**88**	**928**	**85**		

Table 4.33 showed that lack of availability of labour, lack of irrigation facilities, effect of climate change, natural calamities; high transportation cost, attack of pest and diseases, delay in cash realisation and attack of animals were found as mostly felt constraint by the Chengalikodan farmers. In the blocks (Wadakkanchery and Pazhayannur) Chengalikodan banana was cultivated nearer to the forest area. That was the main reason for attacking of animals like monkey, elephant, peacock and wild pig. Price fluctuations, lack of fair prices and lack of owned fund were moderately felt and lack of sucker was the least felt constraint for Chengalikodan farmers. Farmers were taking suckers from Chengalikodan after harvesting, so they were not facing any problem regarding the availability of suckers.

The mostly felt constraint faced by nedunendran farmers were the attack of pest and diseases and natural calamities. The other problems were lack of availability of labour,

Lack of sucker, effect of climate change, price fluctuations , lack of fair price and cash in hand were identified as moderately felt constraint among farmers. Compared to other constraints inadequate credit, lack of irrigation facilities, high transportation cost, attack of animals (monkey, elephant, wild pig) were least felt by nedunendran farmers. They opined that a flood happened in 2018 was destroyed all their farm wealth and the recovery was very difficult for them. They had no problem with irrigation facilities because of peechi dam was always open for agricultural purpose.

For both Chengalikodan and nedunendran farmers, mostly felt constraints were attack of pest and diseases and natural calamities. The farmers opined that quality of pesticides available was not worth to control pests and diseases.

Kruskal walli test revealed that there are differences in constraints faced by the Chengalikodan and nedunendran farmers especially with respect to the problems of lack of sucker, attack of pests and diseases, natural calamities, high transportation cost, lack of owned fund and attack of animals.

4.4.2 Constraints faced by SKS

To find out the constraints faced by the SKS, information were collected from SKS offices in Ollukkara and Kodakara block. Lack of fair price, price fluctuations, lack of knowledge about financial system were the main constraints cited by the SKS. The other constraints like effect of climate change, attack of pest and diseases, lack of scientific information about storing, and lack of demand were not a severe problem for SKS.

4.4.3 Constraints faced by wholesaler

Wholesalers face the constraints related to procurement and marketing, the problems relating to each of these variables were presented below, with composite Indices.

Indices range defining constraints faced by wholesalers

	Chengalikodan (N=7)
Mostly felt	Greater than 70
Moderately felt	37– 69
Least felt	Less than 36
Standard Deviation	17
Mean	53

Table 4.34 Constraints faced by wholesalers

Constraints	Score	Indices
Lack of storage facility	10	48
Non availability of required quantity	7	33
Lack of quality of the product	10	48
Less shelf life	10	48
Attack of rats, insects etc.	14	67
Inadequate demand	10	48
Lack of proper market information	10	48
Price fluctuation	19	**90**
Composite Indices	**90**	**53**

(Source: compiled from primary data)

The major constraint faced by wholesalers was price fluctuation in the market which makes the margin unpredictable. Availability product was not a major constraint for wholesalers because it was sufficiently produced by farmers. The other constraints like lack of storage facility, lack of quality of the product, less shelf life, attack of rats, insects etc, inadequate demand and lack of proper market information were moderately affected.

4.4.4 Constraints faced by retailer

Retailer is the main actor who delivers the raw product to the ultimate consumers. He purchase from wholesalers and sell individual units to the end consumers. Retailers are going through different obstacles from procurement to marketing of nendran. The details are shown in table.4.35.

Indices range defining the constraints faced by retailers

	Chengalikodan (7)	Nedunendran(9)	Total (16)
Mostly felt	Greater than 80	Greater than 71	Greater than 75
Moderately felt	35– 79	36 – 70	36 – 74
Least felt	Less than 36	Less than 37	Less than 37
Standard Deviation	22	17	19
Mean	58	54	56

Table 4.35 Constraints faced by retailers

Particulars	Chengalikodan (7)		Nedunendran (9)		Total (16)	
	Score	Indices	Score	Indices	Score	Indices
Lack of storage facility	7	33	13	48	20	42
Non availability of required quantity	7	33	9	33	16	33
Lack of quality of the product	7	33	9	33	16	33
High transportation cost	14	67	17	63	31	64
Less shelf life	14	67	16	59	30	62
Attack of rats, insects etc.	15	71	17	63	32	67
Inadequate demand	8	38	10	37	18	37
Lack of proper market information	13	62	14	52	27	56
Wastage on transportation during packaging	16	76	18	67	34	71
Price fluctuation	21	**100**	23	**85**	44	**92**
Composite score / Indices	**122**	**58**	**146**	**54**	**268**	**56**

(Source: compiled from primary data)

It could be inferred from the table 4.35 that the only critical problem for retailer was price fluctuation for both Chengalikodan and nedunendran. It leads to deduction in the margin because of unforeseen changes in prices. High transportation cost, less shelf life, attack of rats, insects' etc. inadequate demand, lack of proper market information and wastage on transportation during packaging were moderately affected. Storage of banana and its availability and quality was not considered as a problem by retailers.

4.4.5 Constraints faced by consumers

Consumer is the end point of value chain. While purchasing the nendran variety consumer faces certain constraints such as non availability of required quantity, non availability of good quality of the product etc. the following section tries to discuss the major constraints faced by consumers and is presented in the table 4.36.

Indices range defining constraints faced by consumers

	Chengalikodan	Nedunendran	Total
Mostly felt	Greater than 41	Greater than 43	Greater than 42
Moderately felt	35 – 41	37 – 43	36 – 42
Least felt	Less than 35	Less than 37	Less than 36
Standard Deviation	3	3	3
Mean	38	40	39

Table 4.36 Constraints faced by consumers

Statements	Chengalikodan (40)		Nedunendran (40)		Total (80)	
	Score	Indices	Score	Indices	Score	Indices
Non availability of required quantity.	50	**42**	53	**44**	103	**43**
Non- availability of good quality of the product.	46	38	47	39	93	39
Less shelf life of the product.	45	37	50	42	95	39
High price.	41	34	43	36	84	35
Composite score / Indices	**182**	**38**	**193**	**40**	**375**	**39**

(Source: compiled from primary data)

It observed that non availability of required quantity at any time pointed out as the major problem faced by consumers because of the high demand for the product especially during onam season. Non availability of good quality of the product, less shelf life of the product, and high price was not a major problem for consumers. The supply did not meet

the demand of consumers towards nendran varieties so farmers may increase the production and taken the measures to increase the productivity.

Perceived solutions suggested by the actors involved in improving the value chain

After identifying the constraints faced by the actors in the value chain they were asked to suggest their perceived solutions to the constraints encountered by them. After analysing the Problem it was understood that problems were mainly faced by the farmers when compared to the other actors in the value chain. For others the problems were either negligible or tolerable. The perceived suggestions were as follows,

- Krishibhavan may possibly take the proceedings for supply tissue culture banana may be channeled through Krishibhavan so as to improve the quality of the produce.
- Government may take the initiative to reduce the price fluctuation by fixing a base price for farmers when there is a high fall in price.
- Forest authorities may take necessary steps to protect banana farmers from the attack of wild animals such as elephant, monkey and wild pig.
- Farmers opined that the pesticides available in the market are not having quality to protect the banana from attack of pests and diseases.

This chapter mapped the value chain of banana in Thrissur district. A detailed analysis of actors in the value chain, their cost and margins and the constraints faced by them was also done. The major findings and conclusion of the analysis was presented in chapter five.

SUMMARY OF FINDINGS AND CONCLUSION

CHAPTER – V

SUMMARY OF FINDINGS AND CONCLUSION

The present study entitled value chain analysis of nendran variety in Thrissur district focused on the objectives viz; to map the value chain of nendran variety of banana, identify and anlayse the various chains and actors involved in the value chain, to analyse the cost and margins involved in the value chain and identify the constraints and possible solutions at different levels in the value chain. The primary data for the study were collected from 60 banana farmers (30 Chengalikodan and 30 Nedunendran farmers) and the other actors in the value chain two SKS of VFPCK, seven wholesalers, sixteen retailers and eighty consumers were selected from Thrissur district of Kerala. The objectives were analysed by using the tools such as value chain mapping tool, percentage analysis, rank order scale, indices, Kruskal wallis test, ANOVA, Price spread, marketing cost, marketing efficiency, marketing margin, producer's price, marketing margin of middle men.

5.1 Findings

The major findings of the study are as follows:

5.1.1 Mapping of value chain of nendran variety.

For mapping of value chain of nendran variety of banana, global approach suggested by Gereffi and Korzeniewicz (1994) and Kaplinsky (1999) have used to map value chain of nendran variety. The dimension mapped was as follows.

- Farmers require basic inputs such as suckers, fertilisers, machinery, supporting stick, technology, information and credit for cultivation.
- Krishibhavan, SKS, local traders, and SBI were main sources of inputs for farmers.
- Farmers, wholesalers, retailers, consumer, Krishibhavan, local traders, and SBI were the major actors involved in the channel of Chengalikodan, whereas farmers, SKS, retailers, consumers, local traders, and SBI were the major actors in channel of nedunendran.

- Both nendran varieties flowed in the form of raw banana only. The value addition was not possible in Chengalikodan and nedunendran.
- Krishibhavan was the main source of information for Chengalikodan farmers whereas SKS for nedunendran farmers. The rest of actors (SKS, wholesalers, and retailers) in the Chengalikodan and nedunendran depended on Thrissur market for collecting business related information about the product and price.
- The nendran varieties of Chengalikodan and nedunendran were sold within the various places of Thrissur district, and there was no export activity undertaken by the value chain actors.
- Margins were different for those two type channels. Chengalikodan value chain actors margin (₹56.6/kg) was very high than nedunendran actors (₹37.3/kg). From that farmers got the highest margin from channel of Chengalikodan.

5.1.2 The various chains and actors involved in the value chain

- Nendran variety passes through various chains and actors. One marketing channel for Chengalikodan and one marketing channel for nedunendran were identified.
- Farmer is the prime actor in the nendran variety of value chain. 95 percent total area under cultivation was used by Chengalikodan farmers than nedunendran farmers (68 percent).
- Most of the farmer respondents (48 percent) were having 40 to 50 years of experience.
- High yield and increased demand were the main reason for choosing the both varieties for cultivation.
- The maximum weight of Chengalikodan for one bunch was 20 to 25 kg; but it is 16 kg for nedunendran.
- Chengalikodan farmers (100 percent) used to sell the produce directly to wholesalers and nedunendran farmers (100 percent) sold it to SKS.
- SKS and Krishi Bhavan were the major sources of information for both nedunendran and Chengalikodan.
- Chengalikodan farmers were used self produced suckers for the cultivation. But for the nedunendran farmers suckers supplied by local traders.

- Both farmers had to wait one week to two weeks for realisation of return from both wholesalers and SKS. No actors took advance sales contract from farmers.
- SKS was the most important actor and plays a major role in procurement of nedunendran value chain. SKS procure nedunendran bananas from farmers with a commission at five percent (For example: For amount of ₹ 100 then farmers would only receive ₹ 95. Commission at ₹ 5 would be taken for activities of SKS).
- SKS collected source of information related to product and price from Shakthan Thampuran Fruits and Vegetables market (Thrissur). They were providing various training, classes and workshops for farmers with the support of Krishibhavan. They had to wait one week to two weeks for realisation of return from retailers. There was no advance sales contract with any actors in nedunendran value chain.
- Wholesalers were the secondary intermediary involved in value chain of Chengalikodan banana. They procured Chengalikodan bananas directly from farmers and sold to retailers on a certain percentage of margin and retailers in turn sold to direct customers.
- Wholesalers had to wait one week to two weeks for realisation return from retailers and no advance sales contract with any actors in Chengalikodan value chain.
- Retailers sold Chengalikodan and nedunendran directly to ultimate consumers. Chengalikodan retailers procured 49750kg (17 percent) directly from wholesalers with ₹92/kg. Nedunendran retailers procured 11020 kg (22 percent) directly from SKS with ₹73/kg.
- 100 percent of consumer respondents were purchasing nendran in all forms. Majority of the consumers (86 percent) were purchasing nendran from retailers. 7 percent and 6 percent purchased nendran from wholesalers and direct from neighbours.
- Consumers ranked taste as the first determinant for purchasing nendran followed by price, freshness, family preference and easy to prepare.
- Consumers of both Chengalikodan and nedunendran banana farmers were moderately favourable attitude towards taste of banana. Regarding the chemical content of banana consumers having an unfavourable attitude. ANOVA results showed that there was no difference in the attitudes of Chengalikodan and nedunendran.

- Chengalikodan and nedunendran consumers have resigned stage in respect to price, taste, nutrient value, freshness, hygiene, availability and shelf life of the nendran banana. Analysis of variance results indicated that Chengalikodan and nedunendran were similar with respect satisfaction of consumers towards purchase of nendran.
- Krishibhavan provided fertilisers to farmers at subsidised price. The main fertilisers used for nendran variety cultivation are urea, potash, dolomite, lime, poultry waste, goat manure and cow dung.
- Machineries, supporting stick, nedunendran suckers are the inputs availed by the farmers from local traders. Local traders supplied two types of supporting stick like bamboo and choola of ₹ 100 and ₹ 80 respectively.
- Farmers depended on nationalised bank for financial inputs. They normally avail loans under Kissan Credit Card scheme which was revolving at subsidy rate of four percent. The major inputs in the studied area from State Bank of India.

5.1.3 Cost and margins involved in the value chain

- Comparing the cost of both Chengalikodan and nedunendran, Chengalikodan farmers incurred high input cost (₹ 19.61/kg) and nedunendran farmers (₹18.23/kg).
- The marketing cost was higher for Chengalikodan farmers than nedunendran farmers. The high marketing cost for Chengalikodan is due to the long distance to market and high loading/unloading charges.
- The SKS incurred an investment cost of ₹ 0.942/kg.
- The total investment cost incurred by wholesalers was ₹ 0.96/kg. In wholesale business the only marketing cost was labour charge (for sales) (₹.68/kg) and loading charges (₹.65kg). Wholesalers were not incurring any cost for promotion.
- Retailers of nedunendran spend more investment cost than retailer of Chengalikodan. It was due to the cost of weighing machine component.
- Marketing cost includes cost of labour (for sale), transportation and loading/ unloading cost. The retailers of nendran variety incurred high cost for transportation (₹7/kg for Chengalikodan and ₹9.2/kg for Nedunendran) than labour cost.
- There was a considerable difference in margin received by Chengalikodan farmers (₹ 56.6/kg) and nedunendran farmers (₹ 37.3/kg). Comparing the channel of

Chengalikodan and nedunendran, Chengalikodan farmers were receiving more margin from sale.

- All the intermediate actors between farmer and consumer earn a profit margin. Chengalikodan retailer earned a margin of ₹. 8.9 Per kilogram which was the highest margin than nedunendran retailers who received of ₹ 2.1 per kilogram. Overall it was clear that Chengalikodan was more profitable than nedunendran cultivation.
- All the actors involved in Chengalikodan and nedunendran had a higher margin than the actors involved in the nedunendran.
- Marketing efficiency was higher in Chengalikodan than nedunendran.

5.1.4 Constraints faced by the actors in the value chain

- Lack of availability of labour, lack of irrigation facilities, effect of climate change, natural calamities, high transportation cost, attack of pest and diseases, delay in cash realisation and attack of animals were found as mostly felt constraint by the Chengalikodan farmers.
- The mostly felt constraints faced by nedunendran farmers were attack of pest and diseases and natural calamities.
- Lack of fair price, price fluctuations, lack of knowledge about financial system were the main constraints cited by the SKS.
- The major constraint faced by wholesalers was price fluctuation in the market. The other constraints like lack of storage facility, lack of quality of the product, less shelf life, attack of rats, insects etc, inadequate demand and lack of proper market information were moderately affected.
- The only critical problem for retailer was price fluctuation in both Chengalikodan and nedunendran. High transportation cost, less shelf life, attack of rats, insects etc. inadequate demand, lack of proper market information and wastage of banana during transportation were moderately affected.
- Non availability of required quantity at any time pointed out as the major problem faced by consumers.

5.2 Suggestions

Based on the observations made from the field and findings of the study following suggestions are proposed:

- Lack of irrigation facilities was one of the mostly felt constraints pointed out by farmers in Wadakkanchery and Pazhayannur blocks. This necessitates the need for taking initiative by the government to provide irrigation facility by releasing water through canals for farmers as and when it is needed.
- Farmers opined that quality of pesticides available in the open market is not sufficient to prevent the attack of pests and diseases. Hence it may be suggested to provide quality pesticides to farmers through Krishibhavan and SKS.
- During onam season, supply of banana failed to meet its demand of consumers. This highlights the need to expand the area under cultivation and increase in the production during this season. Farmers may take these aspects in to consideration.
- Farmers suggested for conducting more training classes regarding the new production technology and post- harvest techniques. Kerala Agricultural University (KAU) may provide appropriate technical guidance and KVK may conduct trails/ demonstrate on the technical constraints faced by banana growers.
- The attack of animals such as elephant, monkey, and wild pig was another most felt problem pointed out by the farmers in the area of Wadakkanchery and Pazhayannur. As this area was near to the forest area appropriate measures may be taken by the concerned authorities to protect the farmers from the attack of animals.
- It was observed from the study that farmers are not aware about the availability of tissue culture suckers of banana Even though Kerala Agricultural University is producing these suckers, the farmers were not aware about it. Awareness campaigns may be initiated by KAU in line with Krishibhavan. Krishibhavan may ensure the availability of tissue culture suckers to the needed famers by contacting KAU in advance so that KAU can make arrangements for the production of sufficient quantity of tissue culture suckers.

5.3 Conclusion

The present study mapped the value chain of nendran variety of banana and analysed the various actors involved in the value chain. The study also examined the cost and margins involved for each value chain actors and identified the constraints faced by the value chain actors at different levels. The study found out one marketing channel each for Chengalikodan and nedunendran in the studied area. Among these marketing channels in the value chain, channel for Chengalikodan provides a good profit margin to all actors. It may be due to the fact that Chengalikodan is a popular GI product in Kerala and the taste, quality and appearance helped the product to get premium price. The involvements of intermediaries still exist in the value chain of nendran varieties. It reduces marketing efficiency of nendran value chain due to the increased cost and shared margin among the intermediaries. The farmers facing the problems like lack of irrigation facility, lack of quality suckers, lack of quality pesticides, natural calamities, lack of training on new production technology and post harvest technology, and high transportation cost. Interventions of the institutions like Krishibhavan, SKS, Kerala Agricultural University and other government agencies were needed to address these issues.

REFERENCES

References

- Abodium, O. A. 2016. Participation of physically challenged people in agricultural value chain: implication on food sustainability in Nigeria. *J.Agric.Stud.* 5(1) (in Press).
- Acharya,S.S. and Agarwal, N.L. 1987. Agricultural marketing in India (India Reprint, 2004) Oxford and IBH publishing Co. Pvt.Lts., New Delhi, pp.396- 417.
- Addisu H. 2016. Value chain analysis of vegetables: the case of Ejere district, west Shoa zone, Oromia national regional state of Ethiopia. *Int. J. Managing Value and Supply Chains.* 6(2):35-45.
- Agarwal, N.L. and Saini,T.C. 1995. Vegetables marketing – A case study of Jaipur market. *Indian J.Agric.Mkt.* 9(1):36-43.
- Alex, A., Jeremia, M., and George, T. 2015. Assessment of innovative market options for banana value chain in Uganda. *J.Of Dev. and Agric. Econ.*7: 323 – 331.
- Anisa, Q. 2013. Value chain analysis of medicinal plants from Berati region in Central Albania. M.Sc. (Agric.Econ.) thesis, Agricultural University of Tirana. 105p.
- Ann, P.D. and Ajjan, N. 2014. Banana value chain in South India. *Int. J. Com. Bus. Mgmt.* Vol.7 (2), pp. 367-371.
- Babua, D. and Vermab, N.K. 2010. Value Chains of Milk and Milk Products in Organised Sector of Tamil Nadu —A Comparative Analysis. *Agric. Econ. Res. Rev.*, Vol.23, pp. 479 – 486.
- Basnet, T. B. 2014. Value chain analysis of tomato produced under IPM approach in different ecological regions. B.Sc. (Agri.) thesis, Purbanchal University, Kathmandu. 70p.
- Basu, J.P. 2010. Efficiency in wholesale. Retail, and village markets: A study of potato markets in West Bengal. *J.of S.Asian Dev.* 5(1)85-111.
- Bhattarai, D. et.al. 2013. Value chain analysis of gerbera cut flower in Kathmandu Valley. *Agric. Econ. and Bus. Mmgt.* 50(4).
- Bhavya V. 2010. Value Chain Analysis for Coffee in Karnataka, India. M.Sc (Rural Development) thesis, Ghent University, Belgium, 76p.
- Brane, N. and Radoslav, G. 2012. Value chain analysis for meat and meat products. Development agency EDA. University of East Sarajevo, Bosnia.

- Chandrasekaran, M. and Umagowri, M. 2011. An economic analysis of value chain of banana in western Tamil Nadu. *J. of supply chain management,* Vol. VIII (3), pp. 66-80.
- Deshmukh, D., Prashant, S.P., and Anawade, P. 2013. Constraints in banana marketing and scope of improvement: A case study for Jalgaon region. *Int. J. Sci. spirituality, business and technol.* 2:74-78. [On-line]. Available: http://www.ijssbt.org/volume2/pdf/14.pdf. [15 Nov. 2014].
- Devi.A.2014. Value chain mapping of Njaalipoovan, Thrissur. B.Sc. (C&B) thesis, Kerala Agricultural University, Vellanikkara.
- DFID [Department for International Development] 2008. *Making value chain work better for the poor: A tool book for practitioners of value chain analysis* (version 3). Department for international Development, Phnom Penh, Cambodia.
- Gangwar,L.S., Sara,S. and Kumar, S. 2010. Broilers supply value chain in the national capital region Delhi: a study of Ganzipur poultry market. *Agric. Econ. Res.Rev.*, 23:461-468.
- Garmin,H., Castellon, N., Grote, U., and Staver,C. 2013. Banana Value chains in Central America – options for small holders on domestic regional markets. Leibniz University Hannover, Germany.
- GOI [Government Of India]. 2018. *Report of Department of Agriculture and co-operation 2017-2018.* Department of Agriculture, Cooperation & Farmers Welfare Ministry of Agriculture & Farmers Welfare, India. Pp.10-12
- GOI [Government of India] 2018. Ministry of Agriculture & Farmers Welfare, Govt. of India, [Online]. Available: https://www.indiastat.com/table/agriculture-data/2/horticulture/118/1116096/data.aspx. [28 June 2019].
- GOK [Government Of Kerala].2016. *Report On Cost of Cultivation of Important Crops in Kerala 2015-2016.* Department of Economics and Statistics, Kerala. pp.5-8.
- India Scenario. 2018. Economics Review 2018 [On-line]. Available: https://www.google.com/search?ei=fJYlXZqCE4L49QPBhpfYBg&q=current+scenario+of+india&oq=india+scenario&gs_l=psyab.1.0.0i71l8.0.0..5132...0.0..0.0.0.....0.....gws-wiz.pNNrHFL3rA0. [20 March 2019].
- Jadav,K.S., Leua, A.K., and darji,V.B. 2011. Economic analysis of Supply chain of fresh potato in middle Gujarat. *Indian J.Agric.Res.* 45(4).

- Jean,B.C., Afari- sefa, V., Endamana,D., Tenkouano.A., kane,G.Q.2016. Value chain analysis of vegetables in the humid tropics of Cameroon [abstract]. In: Abstracts; 5th *African Association of Agricultural Economists Conference*: 23-26, September, 2016, int. Union for Conservation of Nature, Cameroon.22p.
- Krishnan,M. and Narayanakumar, R. 2010. Structure, conduct, and performance of value chain in seafood farming in India. *Agric.Econ.Res.Review*. Vol.23.505 – 514 pp.
- Kumi E. 2017. Value chain analysis of tomato in the kpone-katamanso district of Ghana. *J.Agri. Busi.* 40(2).
- Madhumitha.S. (2011). Value chain analysis of vegetables grown in Udhagamandalam district of Tamil Nadu. *Agric. Econ. Res. Rev.*, Vol.25, pp. 358 – 390.
- Muluken, M. 2014. Value chain analysis of fruits for debub bench woreda, bench maji zone, Snnpr. M.Sc.(ag.) thesis.
- Nagaraj,B.V. and Krishnegowda, Y. T. 2015. Value chain analysis for derived products from paddy: a case of Karnataka state. *Indian. J. of Agric. Mkt*. 25(2):120-130.
- Nikam,A.V.,Shendage,p.N.Jadhav,K.L.and Deokate,T.B. 2007. Marketing of Kharif potato in Satara district Maharashtra. *Indian.J.Agric.Mkt.* 21(2): 188-194.
- Niraj,K. and Sanjeev,K. 2010. Value chain analysis of coconut in Orissa. *Agric.Econ.Res.Review*. Vol.23.411 – 418 pp.
- Nkuba,J. and Ndunguru, A. 2012. Rice value chain analysis in Tanzania: identification of constraints, opportunities and upgrading strategies. *Int. J. Com. Bus. Mgmt*. Vol.10 (2), pp. 347-350.
- Ouma, R.,Jewel, M., and Mary,N. (2010) Banana marketing in Rwanda, Burundi, South Kivu. *Int.J.of Mkt*. Vol.10. 25-30.
- Porter, M. E. 1985. Competative Advantage: Creating And Sustaining Superior Performance. [Online] Available http://www.freewebs.com/dangdinhtramstrategy/011.pdf (18 May 2019)
- Raman.R.2014. Value chain analysis of banana (nendran) in Vellangallur, Thrissur. B.Sc.(C&B) thesis, Kerala Agricultural University, Vellanikkara.
- Richard, B. 2014. An analysis of the value chain for indegeneous chickens in Zambia's Lusaka and cenral provinces. *J.Agric. Stud.* 2(2) (in press).

- Roshni,R. 2012. A study on value chain of pineapple and banana in Srilanka. *J.Supply chain Mangt.* Syst.2 (2) 40-55.
- Sachchida,S. 2013. Value chain of banana in Bardiya district of Nepal. B.Sc.(Ag.) thesis, State Agricultural University, Nepal. 100p.
- Safaraz, A.2015. study of supply chain management and marketing of apple in Kashmir region of Jammu and Kashmir, India. B.Sc.(Ag.) thesis. State Agricultural University, Hydrabad.69p.
- Saurav – Neji and Neeraj- Anand. 2015. Supply chain of fruits and vegetables in agribusiness in Uttarakand, India. Major issues and challenges. *J.Supply Chain Management.* Syst.4 (1)43-57.
- Sharma, K.D. and Pathania, M.S. 2010. Value Chain Analysis and Financial Viability of Agro-Processing Industries in Himachal Pradesh. *Agric. Econ. Res. Rev.* Vol. 23. pp 515-522.
- Shelke,R.D.2009. Economics of price spreas in marketing of major vegetables in Prabhani market. *Econ. Affairs*. 54(3-4):118-123.
- Sultan,U.M. 2016. Analysis of wheat value chain: The case sinana district, Bale zone, Oromia region, Ethiopia. M.Sc (Agric. Econ.) thesis, Harmaya University, Harmaya.111p.
- Susheela- meena and singh, I.P. 2014. Price spread and efficiency of marketing of tomato in Rajsthan. *Indain. J.Agric.Res*. 45(4):294-300.
- Swetha, M.K. and Naik, B.K .2016.Value chain management in banana and sapota fruits and its supply forecast in India. *Int. J.Of Agri. And Statistical Sci.*12:59 – 63.
- Teklay,T. 2016. Value Chain Analysis of Banana in 'Tekeze' River Basin, North Ethiopia. B.Sc. (Ag.) thesis, Aksum University, Ethiopia. 100p.
- UNIDO [United Nations Industrial Development Organisation] 2011. *Pro-value chain development: 25 guiding questions for designing and implementing agro industry projects.* United Nations Industrial Development Organisation, Vienna, Austria.58p.
- Vedamurthy,K.P. 1985. Agribusiness Management and Trade. [Online] Available http://ecoursesonline.iasri.res.in/ (18 May 2019)
- Venkatesh, B. 2011. Value chain analysis for coffee in Karnataka, India. Msc. Thesis, Ghent University, Belgium. 78p.

- Verma, A.R., Rajput, A.M.,Patidar, R.S.2001. Price spread, marketing efficiency and constraints in marketing of onion in Indore district of Madhya Pradesh. *Indian J.Agric.Mkt.* 18(2):66-76.
- World Scenario. 2017. [On-line]. Available: https://www.google.com/search?ei=gpYlXfizCYL59QPP66qYCA&q=current+scenario+of+world 2017-2018&oq=current+scenario+of+world+2017-2018&gs_l=psyab.3...68438.73499..73866...0.0..0.197.1874.0j15.....0....1..gwswiz.....0i71j0i20i263j0j0i22i30j33i22i29i30.xuGfTaHc5u0.

VALUE CHAIN ANALYSIS OF BANANA; NENDRAN VARIETY IN THRISSUR DISTRICT

By

Haritha Paul

(2017-15-001)

ABSTRACT OF THE THESIS

Submitted in partial fulfillment of the requirement
For the degree of

Master of Science in Co-operation & Banking
(Rural Marketing Management)

Faculty of Agriculture

Kerala Agricultural University, Thrissur

Department of Rural Marketing Management
COLLEGE OF CO-OPERATION, BANKING AND MANAGEMENT
KERALA AGRICULTURAL UNIVERSITY
VELLANIKKARA, THRISSUR-680656
KERALA, INDIA

2019

ABSTRACT

Nendran is one of the most important commercial varieties of banana grown in Kerala. This variety is grown for both fruit and vegetable purposes. The long and thick fruits with good shelf life make nendran widely acceptable among consumers. Nendran varieties like Nedunendran, Chengalikodan, and Zanzibar are the varieties grown as irrigated crops. In south India nendran varieties are grown mostly in Kerala and Tamil Nadu. Nedunendran and Chengalikodan varieties are the most popular varieties grown in Kerala. The nendran banana which is originated and cultivated in Chengazhikodu village of Thrissur district in Kerala state of India is known as Chengalikodan nendran and has GI certification since 2015 due to its unique features. It differs from other varieties of nendran as the bunch bear 20 to 25 kg golden yellow coloured fruits if properly taken care of. During the growth stage, traditional farmers cover the banana bunches with old banana leaves so that it can get the colour and special shape. It is also offered as Kaazchakula for lord Guruvayoorappan by the devotees.

Even though Kerala has a good potential for banana cultivation, due to careless handling of produce, about 25-40 percent are being wasted, 2-3 percent is processed as value added products, and the remaining being used in the raw form (Report of department of agriculture and co-operation 2017-18). This leads to non-realisation of optimum price and wide price variations, both spatial and temporal, which disheartens farmers. In order to sustain production and growth potential, it is essential to produce value added products from banana, so that farmers can get an assured price for their produce throughout the year. Due to inefficiencies at various points in the value chain, the producer gets less than optimal and the consumer pays more than optimal price.

The present study entitled "Value chain analysis of banana; Nendran variety in Thrissur district" was undertaken with the objectives viz., to map the value chain of Nendran variety of banana, to identify and analyse the various chains and actors involved in the value chain, to analyse the costs and margin involved in the value chain and to identify the constraints and possible solutions at different levels in the value chain to enhance the efficiency. Two varieties of nendran namely nedunendran and Chengalikodan were taken

for the study. For the purpose of collection of primary data a sample of 60 farmers (who cultivated at least 200 suckers of Chengalikodan or nedunendran banana) were selected from four blocks of Thrissur district (15 farmers each). From the other actors in the value chain, two SKS of VFPCK, seven wholesalers, 16 retailers and 80 consumers were selected based on the information received from farmers. Primary survey was conducted using a pre- tested structured interview schedule. The collected data were analysed by using percentage analysis, indices, rank order scale, Kruskal Walli test, ANOVA, price spread, marketing cost, marketing efficiency, and marketing margin.

Mapping the value chain of Nendran variety of banana revealed that the core processes include input supply, production, procurement, marketing and consumption. Farmers, wholesalers, retailers, consumers, Krishibhavan, local traders, and SBI were the major actors involved in the value chain of Chengalikodan, whereas farmers, SKS, retailers, consumers, local traders, and SBI were the major actors involved in nedunenthran. It was observed that almost the entire produce of Chengalikodan and nedunendran flowed in the form of raw banana among the actors. The main source of information was Krishibhavan for Chengalikodan farmers and SKS for nedunendran farmers. The rest of actors in the Chengalikodan and nedunendran depended on Shakthan Thampuran Fruits and Vegetables market (Thrissur) for collection of business related information about the product and price. These varieties were sold within the various places of Thrissur district, and there was no export activity undertaken by the value chain actors. It was found that Chengalikodan farmers were earning a high margin of ₹ 56.6/kg compared to a margin of ₹37.3/kg for nedunendran. The study also identified major constraints faced by the actors in the value chain.

The analysis of various chains and actors involved in the value chain highlighted that there was only one marketing channel for Chengalikodan and one for nedunendran in the study area. Farmers, wholesalers, retailers and consumers were the actors involved in the value chain of Chengalikodan whereas farmers, SKS, retailers and consumers for nedunendran. No one took advance amount in sales contract in any manner. The actors other than retailers and consumers had to wait one to two weeks for realisation of price. Consumers of both Chengalikodan and nedunendran expressed moderately favourable

attitude towards taste of banana. ANOVA results showed that there was no difference in the attitude of consumers towards Chengalikodan and nedunenthran. Chengalikodan and nedunendran consumers had a resigned stage in respect to price, taste, nutrient value, freshness, hygiene, availability and shelf life of the nendran banana. Analysis of variance result indicated that the satisfaction level of consumers was similar for both Chengalikodan and nedunendran.

The cost and margins involved in the value chain showed that there was a considerable difference in margin received by Chengalikodan farmers (₹ 56.6/kg) and nedunendran farmers (₹ 37.3/kg). Comparing the channel of Chengalikodan and nedunenthran, Chengalikodan farmers were receiving more margins from sales. The wholesalers received a margin of ₹ 10.1/kg and SKS ₹15.1/kg whereas retailers earned a margin of ₹ 8.9/kilogram and of ₹ 2.1/kilogram for Chengalikodan and nedunendran respectively. In short it was clear that Chengalikodan was more profitable than nedunendran cultivation. Marketing efficiency was higher in Chengalikodan than nedunendran. It might be due to the fact that Chengalikodan was a popular GI product in Kerala and the taste, quality and appearance helped the product to get premium price.

The identified constraints faced by the farmers were the lack of availability of labour, lack of irrigation facilities, effect of climate change, natural calamities, high transportation cost, attack of pest and diseases, delay in cash realisation and attack of animals. Lack of fair price, price fluctuations and lack of knowledge about financial support system were the main constraints cited by the SKS. For wholesalers and retailers, price fluctuations in the market were the major constraint. The other constraints are inadequate storage facility, quality of the product, less shelf life, attack of rats, insects etc, inadequate demand and proper market information. Non availability of required quantity of product throughout the year was pointed out as the major problem faced by consumers.

To conclude, the present study mapped the value chain of nendran variety of banana and analysed the various actors involved in the value chain. The study also examined the cost and margin for each value chain actors and identified the constraints faced by them at

different levels. The study found out one marketing channel each for Chengalikodan and nedunendran in the studied area. Among these marketing channels in the value chain, channel for Chengalikodan provided a good profit margin to all actors. The involvements of intermediaries still exist in the value chain of nendran varieties. It reduced the marketing efficiency of nendran value chain due to the increased cost and shared margin among the intermediaries. The farmers faced the problems such as lack of irrigation facility, lack of quality suckers, lack of quality pesticides, natural calamities, lack of training on new production technology, post harvest technology, and high transportation cost. The important suggestions of the study are to provide quality pesticides and quality suckers to farmers through Krishibhavan and SKS, intervention of Kerala Agricultural University in providing appropriate technical guidance and KVK may conduct trails/ demonstrations on the technical constraints faced by banana growers, and to provide irrigation facility by releasing water through canals for farmers as and when it is needed.

APPENDIX

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF CO-OPERATION, BANKING AND MANAGEMENT

DEPARTMENT OF RURAL MARKETING MANAGEMENT

Interview schedule for farmers

(Used for study purpose only)

Socio- economic characteristics

1. Name of the respondent: Ph No:
2. Address :

3. Age :
4. Sex: M /F
5. Education:
6. Occupation: Agriculture / Government employee / Business / Others.
7. Demographic composition of family members:

Sl. No	Name	Age	Sex	Relationship with respondent	Education	Occupation	
						Main	subsidiary
1. 2. 3. 4. 5.							

8. Annual family income:
9. Income from agriculture :

Details of nenthran variety (Chengalikodan / Nedunenthran) cultivation

10. For how many years you have been doing agriculture?
11. Which variety of nenthran is you are cultivating : Nedunenthran ☐
    Chanagalikodan ☐
12. Area under cultivation:

Sl.no.	Particulars	Area (in cent)		
		Owned land	Lease land	Rent
1.	Total area under cultivation			
2.	Area under banana cultivation:- Chengalikodan / Nedunenthran:			

13. No. of suckers planted at a time:
14. Why do you choose this particular variety?
    High market value ☐ low cost of cultivation ☐ Increasing demand ☐
    Resistance to pest and diseases ☐ High yield ☐ others (specify) .....
15. Seasons in which nenthran is cultivated?
    Nedunenthran / Chanaglikodan:
16. Season price and market price:
17. Harvesting period and time required for cultivation:
    Nedunenthran / Chanaglikodan:
18. Method of cultivation
    Traditional method of farming ☐ Modern method of farming ☐ Others ☐
19. Are you following any KAU packaging practices? Y/N
20. Spacing adopted for planting sucker: 1*1 ☐ 1.5*1.5 ☐ 2.2 ☐ others..... ☐
21. Do you have any inter crop cultivation: Y/N If Yes, Specify.....
    Income from inter crop cultivation:
22. Income from banana:

Sl.no	Product	Total qty produced	Price (kg)
1.	Raw banana		

Input details

23. Details of input procurement:

Chengalikodan/ Nedunenthran	**Informati on source**	**Source of supply**	**Reason for choosing source (Q, RP,CA, Others)**	**Quantity / (Unit)**	**Price**	**subsidy**
Sucker						
Fertilizer						
a) Organic						
b) Inorganic						
Plant protection chemicals A) Biological B) Chemical						
Credit						
Labour						
a) Hired						
b) Family member						
Machineries						
Support cost						
Organic certification cost						
Irrigation facilities						
Insurance services						
Others (specify).....						

Reasons: (1- Quality, 2- Reasonable price,3- Credit availability, Others)

24. Details of labour cost involved in cultivation

Particulars	Hired						Family member					
	Male			Female			Male			Female		
	No.	No. of D/ H	W	No.	No. of D/H	W	No.	No. of D/H	W	No.	No. of D/H	W
Land preparation												
Sucker planting												
Application of fertilizer Pesticides : Loading : Unloading:												
Weeding												
Irrigation												
Harvesting												
Others....												

25. Transportation cost for input supply:

Particulars	Chengalikodan / Nedunenthran	
	Mode of payment	Cost of transportation
Sucker		
Fertilizer		

Pesticides		

26. Machineries cost

Machineries	**Cost**	**Year of used**	**Labour cost**	**Other expenses (petrol / diesel, maintenance)**
Owned				
Lease (rent)				

27. Are you availing credit :

Yes ☐ No ☐

28. If yes , credit details:

Source of credit	**Amount**		**Rate of interest**	**Period of credit**
	Amount of loan	**Loan outstanding**		
Nationalized bank Co-operative bank Money lender Friends & relatives Others…. If any				

29. Institutional linkages:

Institution	**Finance**	**Training**	**guidance**	**machinary**	**Marketing**	**Raw material**	**subsidy**	**Linkages (GL, ML,LL)**
Krishi bhavan								
Local self Govt.								
KAU (Research								

stations								
Banks (Co-operative bank, Nationalised bank, ARDB)								
VFPCK								
Insurance company								
Others ….								

(Linkages: GL- good linkage, ML- moderate linkage, LL- less linkage)

30. Information sources:

Sl.no	Particulars	Information source	Type of information
1	Production		
2	Processing		
3	Harvesting		
4	Marketing		

31. Geographical flow of products:

Sl.no	Actors	Quantity (per kg)	Price (per kg)	Place
1	Agents			
2	Wholesalers			
3	Retailer			
4	Processor			
5	Consumer			
6	Others …..			

Production details

32. Details of production

Particulars	Total no. of sucker planted	Yielded bunch	Yearly total production in Kg	Marketed surplus	Total Productivity (kg)
Chengaliko dan /Nedunenth ran					

33. No. of suckers get after production stage:

34. Whether you sale this sucker? Y/N If yes, Income from the sale of suckers:.....

35. Value added products of nenthran that you know? List it...

Value added products	Aware of value added products	Produce
Banana chips		
Banana wine		
Banana powder		
Banana sauce		
Dried banana		
Banana pulp		
Others.....		

36. Do you produce ,

Value added products	Cost of production	Price per Kg
Banana chips		
Banana wine		
Banana powder		
Banana sauce		
Dried banana		

Banana pulp		
Others……..		

37. Do you store the produce?

Yes ☐ No ☐

If yes, how do you store?

38. Post harvest practices followed

Storing ☐ processing ☐ grading ☐ others (specify)……..

39. Cost involved in harvesting:

Particulars			**Cost**
Harvesting cost	Labour : Family labour : Other labour		
	Machinery		
Cost involved in post - harvest	Labour: Family labour: Other labour:		
	Machinery		
	Storage	Transportation	
		Loading / Unloading	
		Storing cost	

Marketing details

40. Distribution of marketable surplus

Source of supply	**Quantity sold (Kg)**	**Price (Kg)**	**Transportation cost**	**Time required for getting price**
1.consumers 2. agents 3. VFPCK 4. wholesalers /				

retailers 5. Processors 6.Others (specify)				

41. Cost involved in marketing:

Particulars	Cost	Paid by F/ A/P/W/R/C
Transportation cost		
Loading charges		
Unloading charges		

(Paid by F-Farmer, A-agent, P-Processor, W- Wholesaler, R-Retailer, C-Consumer)

42. What are the major problems you faced in pre-production, production, and harvesting and marketing stages:

A) Pre-production

Problems	Rank
Lack of timely availability of labour	
Non- availability of sucker.	
Sucker price is not reasonable.	
Lack of good quality fertilizers and pesticides.	
Lack of awareness regarding sources of supply of input	
Price of fertilizers and pesticides are not reasonable.	
Lack of scientific information about cultivation	
Inadequate credit.	
Attack of pest and diseases.	
Lack of adequate irrigation facilities.	
High cost of irrigation.	
High cost of labour	
Lack of knowledge about the application of inputs.	
Effect of climate change.	
Inadequate extension support	

Natural calamities (flood, draught, climate change)	
Inadequate availability of machinery / harvesting equipments	
Others……..	

B) Post - production

Problems	Rank
Exploitation by intermediaries	
Price fluctuations	
Lack of demand	
Difficulty in identifying potential consumers / customers	
Lack of fair price	
Lack of storage	
High transportation cost	
Others (specify)……	

C) Financial problems

Problems	Rank
Shortage of cash in hand	
t inadequacy	
Complicated and time consuming procedure	
Lack of financial assistance from banks & govt. agencies	
Reluctance from financial institutions.	
Delay in cash realization	
Lack of knowledge about the financial schemes	
High rates of interest	
Others……	

161

43. Suggestions for improving banana production and marketing

Particulars	Suggestions
Input supply (Fertilizers / pesticides)	
Labour availability	
Machinery availability	
Financing	
Govt. regulations	
Transportation facility	
Marketing	
Value addition	
Exploitation of middle man	

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF CO-OPERATION, BANKING AND MANAGEMENT

DEPARTMENT OF RURAL MARKETING MANAGEMENT

Interview schedule for SKS

(Used for study purpose only)

1. Name and address:

2. Year of establishment:
3. Area of operation:

4. No. of members in your institution:

   Active members ☐ Non –active members ☐

5. Which crops that you are procuring, list out…

Vegetables	Fruits

6. Which are the common varieties of banana you are procuring:

   Chengalikodan ☐ Nedunenthran ☐ Others ☐

7. Details of input procurement:

Inputs	Source of supply	Reason for choosing source (Q,RP,CA, Others)	Quantity (kg)	Price (kg)	Subsidy
Sucker					
Fertilizers : a) Organic b) Chemical					
Plant protection: a) Biological b) chemical					
Irrigation facilities					
Insurance services					
Others					

(Quality, reasonable price, credit availability, others)

8. Activities undertaken by VFPCK? List out

Activities	Rank
1. Inputs to the farmers.	
2. Storing their produce.	
3. Insurance service.	
4. Given maximum value to the produce.	
5. Financial assistance.	
6.	

9. Are you getting any support from government? Yes ☐ No ☐

If yes, specify.....

10. Number of farmers selling their produce to this institution?

Member farmer ☐ Non- member farmer ☐

11. Details of procurement

Sl.no	Actor	Quantity procurement	Price / Kg	Mode of payment	Frequency of making purchases
1	Farmers				
2					
3					

12. How do you fix the price?

13. Price variation with source of procurement:

Sl.no	Actors	Reason for variation over price (Q, ST, RP)
1	Farmers	
2		

(Quality, season time, reasonable price)

14. Transportation cost :

Particulars	Mode of transportation	Cost	Paid by (F, VFPCK)
Inputs			
Banana			

15. Are you providing any credit facilities:

Particulars	Amount	Interest rate	Period of credit
Insurance services			

16. Do you have any storage facility? Yes ☐ No ☐

If yes, how do you store?

17. Institutional linkage and type of linkage?

Institution	Finance	Training	Raw material	Guidance	Subsidy	Linkages (GL, ML,LL)
Krishi Bhavan						
Govt.						
Insurance company						
Banks (co-operative bank, nationalized bank, ARDB)						
Others						

18. Information source

Sl. no	Particulars	Information source	Type of information
1.	Storing		
2.	Marketing		
3.			

19. Geographical flow of products:

Sl.no	Actors	Quantity (kg)	Price (kg)	Place	Time required for getting price
1	Agents				
2	Processors				
3	Wholesalers				
4.	Retailers				
5.	Consumer				
6.	Others				

20. Transportation cost in marketing

Sl.no	Mode of transportation	Cost of transportation	Paid by (VFPCK, A, P, W, R, C)
1.			
2.			
3.			
4.			
5.			
6.			

21. What is the method of sale here?

22. What are the major problems faced in marketing the produce?

Problems	Rank
Attack of pest and diseases	
Lack of scientific information about storing	
lack of knowledge about financial schemes	
Lack of awareness regarding sources of supply.	
Inadequate extension support.	
Effect of climate change	
Exploitation by intermediaries	
Price fluctuations	
Lack of demand	
Lack of fair price	
Lack of storage	
High transportation cost	
High rates of interest	
Credit inadequacy.	

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF CO-OPERATION, BANKING AND MANAGEMENT

DEPARTMENT OF RURAL MARKETING MANAGEMENT

Interview schedule for Wholesalers

(Used for study purpose only)

1. Name of the respondent:
2. Age :
3. Gender :
4. Address : Ph.No:

5. Education qualification:

   Illiterate ☐ Below SSLC ☐ SSLC ☐ Plus two ☐ Graduation ☐

   Pg ☐ PhD ☐

6. Year of establishment:
7. Primary occupation :

   Agriculture ☐ Business ☐ Govt. employe ☐ Others ☐

8. Nature of business:

   Wholesaler ☐ Retailer ☐ Processor ☐

9. Type of ownership

   Individual ☐ Partnership ☐ Company ☐ Co-operatives ☐

10. Mode of investment: Own fund ☐ Borrowed fund ☐
11. Average monthly income from business :
12. Cost involved in business

Particulars	Value	Average life span
Land & building Owned: If rented / leased initial deposit made:		

Monthly rent paid:		
Investment furniture		
Investment in vehicle Owned: Monthly rent paid:		
Investment in warehouse Owned: If rented, initial deposits made any: Monthly rent paid:		

13. Is there any contract between you and farmer?

Yes ☐ No ☐

If yes, type of contract?

Oral ☐ Written ☐

14. Terms of contract

Period of contract (in years): .....

Commission (in Rs.).....

15. In which form you procure the produce: Raw / Processed / All type

16. Source of purchase and cost involved in purchase

Sl.no	Actor	Source of information about the seller	Quantity purchased	Price / Kg	Mode of payment	Frequency of making purchase	Place of purchase
1.	Farmers						
2.	Processors						
3.	Private agencies (middle man)						
4.	Others						

17. Price variation with source of procurement

Sl.no	Actors	Reason for variation over price
1.	Farmers	
2.	Processors	
3.	Private agencies (middle man)	
4.	Others	

18. Transportation cost

Particulars	Mode of transportation	Cost of transportation (kg/ tone)
Banana		
Value added products		
Labours : Loading charges Unloading charges		
Driver charges		
Fuel and maintenance charges		
Others specify……		

19. Types of products sold in your institution

Items	Selling price	% of GST if any
Banana chips		
Banana powder		
Banana flour		
Dried banana		
Banana wine		

Banana vinegar		
Banana sauce		
Banana figs		
Banana pulp		
Wafers		
Others ……..		

20. Cost of sales

Particulars		Cost
Transportation cost	Loading / unloading	
	Driver cost	
Promotion cost	Display board	
	Agents	
	Others	

21. Cost of warehousing

Particulars	Cost	Period
Ware house rent / Owned		
Insurance charges		
Labour charges		
Others, specify…		

22. What are the factors affecting demand for nenthran value added products?

Reason	Yes / No
Income of customer	
Substitute products / new products	
Market demand	
Taste and preference of customers.	
Others	

23. Who are the customers of your products

Sl. no	Value added products	Source of buyers (R, Ow, Pc, Mc, CoI, CoK)	Quantity sold	Price/ kg	Place (city/ country)
1	Banana chips				
2	Banana powder				
3	Banana flour				
4	Dried banana				
5	Banana wine				
6	Banana vinegar				
7	Banana sauce				
8	Banana fig				
9	Banana pulp				
10	Wafers				
11	Others				

(Retailers, Other wholesalers, processing companies, Marketing companies, Customers outside India, Customers outside Kerala, others)

24. Whether you are able to meet the demand of your customers

Fully	
More than half percentage	
Only half percentage	
More than 25 percentage	
Below 25 percentage	

25. If not able to meet full demand , how you meet the gap

Particulars	Always	Occasionally	Never
Open market			
Processors			
Other wholesalers			

Others …			

26. Credit support availed by the respondent

Source	Information about the source	Loan details		Rate of interest	Period of credit	
		Amount of loan	Loan outstanding			
Co-operative society						
Nationalized bank						
Private finance companies						
Money lenders						
Others						

27. Information sources:

Sl.no	Particulars	Information source (LG, B,VFPCK,IC)	Type of information
1	Marketing		
2	Storage		
3	Price of Products		
4	Exporting		
5			

(LG- local self government, B-bank, VFPCK – vegetable and fruit promotion council keralam, IC- insurance company)

28. Geographical flow of products

Sl.no	Actors	Quantity (kg)	Price (kg)	Place
1	Agents			
2	Retailers			
3	Consumers			
4	Exporters			
5	Others			

29. Institutional linkages:

Institution	Finance	guidance	Marketing information
Local self Govt.			
Bank			
VFPCK			
Insurance company			
Others ….			

30. Extent of linkages of institutional :

Institution	Strength of contact				
	EL	GL	ML	LL	NL
Local self Govt.					
Bank					
VFPCK					
Insurance company					
Others					

(EL- excellent linkage, GL- good linkage, ML- moderate linkage, LL- less linkage, NL- no linkage)

31. Cost involved in export

Item	Amount	Exporter / Importer	Form of export
Import export code			
Export license			
Insurance cost			
Export quality evaluation charges			
Rent paid at port if any…			

32. If exported, quantity exported and price

Items	Quantity	Price / kg
Banana chips		
Banana powder		
Banana flour		
Dried banana		
Banana wine		
Banana vinegar		
Banana sauce		
Banana figs		
Banana pulp		
Wafers		
Others ……..		

33. What are the major problems faced in procurement, and marketing stages.

Procurement

Particulars	Yes/ No	Mostly felt	Moderately felt	Least felt
No timely procurement				

Non availability of required quantity				
High transportation cost for procurement				
High storage expenses				
Lack of storage facility				
High labour cost				
Non availability of good quality of the product.				
Less shelf life of the product				
Attack of rats, ants, insects				
Others				

Marketing

Particulars	**Yes/ No**	**Mostly felt**	**Moderately felt**	**Least felt**
Inadequate demand				
Wastage on transportation due to packing				
High transportation cost				
Lack of proper market information.				
Lack of proper storage				
Price fluctuations				
Others				

34. What are the major areas where government intervene in your business

During procurement:

1. Price

2.

3.

During marketing

1. Price fixing, packaging
2. Transportation
3.

35. Suggestions if any….

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF CO-OPERATION, BANKING AND MANAGEMENT

DEPARTMENT OF RURAL MARKETING MANAGEMENT

Interview schedule for Retailers

(Used for study purpose only)

1. Name of the respondent:
2. Age :
3. Gender :
4. Address : Ph.No:

5. Education qualification:

   Illiterate ☐ Below SSLC ☐ SSLC ☐ Plus two ☐ Graduation ☐

   Pg ☐ PhD ☐

6. Year of establishment:
7. Primary occupation :

   Agriculture ☐ Business ☐ Govt. employe ☐ Others ☐

8. Nature of business:

   Wholesaler ☐ Retailer ☐ Processor ☐

9. Type of ownership

   Individual ☐ Partnership ☐ Company ☐ Co-operatives ☐

10. Mode of investment: Own fund ☐ Borrowed fund ☐
11. Average monthly income from business :
12. Cost involved in business

Particulars	Value	Average life span
Land & building Owned: If rented / leased initial deposit made:		

Monthly rent paid:		
Investment furniture		
Investment in vehicle Owned: Monthly rent paid:		
Investment in warehouse Owned: If rented, initial deposits made any: Monthly rent paid:		

13. Is there any contract between you and farmer?

Yes ☐ No ☐

If yes, type of contract?

Oral ☐ Written ☐

14. Terms of contract

Period of contract (in years): .....

Commission (in Rs.).....

15. In which form you procure the produce: Raw / Processed / All type

16. Source of purchase and cost involved in purchase

Sl.no	Actor	Source of information about the seller	Quantity purchased	Price / Kg	Mode of payment	Frequency of making purchase	Place of purchase
1.	Farmers						
2.	Processors						
3.	Private agencies (middle man)						
4.	Others						

17. Price variation with source of procurement

Sl.no	Actors	Reason for variation over price
1.	Farmers	
2.	Processors	
3.	Private agencies (middle man)	
4.	Others	

18. Transportation cost

Particulars	Mode of transportation	Cost of transportation (kg/ tone)
Banana		
Value added products		
Labours : Loading charges Unloading charges		
Driver charges		
Fuel and maintenance charges		
Others specify……		

19. Types of products sold in your institution

Items	Selling price	% of GST if any
Banana chips		
Banana powder		
Banana flour		
Dried banana		
Banana wine		

Banana vinegar		
Banana sauce		
Banana figs		
Banana pulp		
Wafers		
Others ……..		

20. Cost of sales

Particulars		Cost
Transportation cost	Loading / unloading	
	Driver cost	
Promotion cost	Display board	
	Agents	
	Others	

21. Cost of warehousing

Particulars	Cost	Period
Ware house rent / Owned		
Insurance charges		
Labour charges		
Others, specify…		

22. What are the factors affecting demand for nenthran value added products?

Reason	Yes / No
Income of customer	
Substitute products / new products	
Market demand	
Taste and preference of customers.	
Others	

23. Who are the customers of your products

Sl. no	Value added products	Source of buyers (R, Ow, Pc, Mc, CoI, CoK)	Quantity sold	Price/ kg	Place (city/ country)
1	Banana chips				
2	Banana powder				
3	Banana flour				
4	Dried banana				
5	Banana wine				
6	Banana vinegar				
7	Banana sauce				
8	Banana fig				
9	Banana pulp				
10	Wafers				
11	Others ….				

(Retailers, Other wholesalers, processing companies, Marketing companies, Customers outside India, Customers outside Kerala, others)

24. Whether you are able to meet the demand of your customers

Fully	
More than half percentage	
Only half percentage	
More than 25 percentage	
Below 25 percentage	

25. If not able to meet full demand , how you meet the gap

Particulars	Always	Occasionally	Never
Open market			
Processors			
Other wholesalers			

Others …			

26. Credit support availed by the respondent

Source	Information about the source	Loan details		Rate of interest	Period of credit	
		Amount of loan	Loan outstanding			
Co-operative society						
Nationalized bank						
Private finance companies						
Money lenders						
Others						

27. Information sources:

Sl.no	Particulars	Information source (LG, B,VFPCK,IC)	Type of information
1	Marketing		
2	Storage		
3	Price of Products		
4	Exporting		
5			

(LG- local self government, B-bank, VFPCK – vegetable and fruit promotion council keralam, IC- insurance company)

28. Geographical flow of products

Sl.no	Actors	Quantity (kg)	Price (kg)	Place
1	Agents			
2	Consumers			
3	Others			

29. Institutional linkages:

Institution	Finance	guidance	Marketing information
Local self Govt.			
Bank			
VFPCK			
Insurance company			
Others			

30. Extent of linkages of institutional :

Institution	Strength of contact				
	EL	GL	ML	LL	NL
Local self Govt.					
Bank					
VFPCK					
Insurance company					
Others					

(EL- excellent linkage, GL- good linkage, ML- moderate linkage, LL- less linkage, NL- no linkage)

31. What are the major problems faced in procurement, and marketing stages.

Procurement

Particulars	Yes/ No	Mostly felt	Moderately felt	Least felt
No timely procurement				
Non availability of required quantity				
High transportation cost for procurement				
High storage expenses				
Lack of storage facility				
High labour cost				
Non availability of good quality of the product.				
Less shelf life of the product				
Attack of rats, ants, insects				
Others				

Marketing

Particulars	Yes/ No	Mostly felt	Moderately felt	Least felt
Inadequate demand				
Wastage on transportation due to packing				
High transportation cost				
Lack of proper market information.				
Lack of proper storage				

Price fluctuations				
Others				

32. What are the major areas where government intervene in your business

    During procurement:

    4. Price
    5.
    6.

    During marketing

    4. Price fixing, packaging
    5. Transportation
    6.

33. Suggestions if any….

186

KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF CO-OPERATION, BANKING AND MANAGEMENT

DEPARTMENT OF RURAL MARKETING MANAGEMENT

Interview schedule for Consumers

(Used for study purpose only)

1. Name of the respondent: Ph No:
2. Address :

3. Age :
4. Sex: M /F
5. Education:
6. Occupation: Agriculture / Government employee / Business / Others.
7. Demographic composition of family members:

Sl. No	Name	Age	Sex	Relationship with respondent	Education	Occupation	
						Main	Subsidiary
1. 2. 3. 4. 5.							

8. Annual family income:

Below 25,000 ☐

Rs. 25,000 - Rs. 50,000 ☐

Rs.50, 000 – Rs. 1, 00,000 ☐

Rs. 1, 00,000 & Above ☐

9. how long you have been consuming Chengalikodan or nedunenthran?
10. Specify the periodicity of purchasing Chengalikodan / nedunenthran for your family:

    Daily ☐

    Twice in a week ☐

    Weekly ☐ otherwise (specify).....

11. Expenditure incurred for purchasing Chengalikodan / nedunenthran in monthly:

Nenthran category	Quantity of purchase	Price / Kg
Chengalikodan		
Nedunenthran		
Total		

12. In which form do you consume Chengalikodan or nedunenthran:

    Vegetable ☐ Fruit ☐ Value added products (chips, pazham pori, etc) ☐

    All ☐

13. In which season you are purchasing more?
14. From where do you purchase Chengalikodan/ nedunenthran:

    Direct from neighbor farmers ☐

    Wholesalers ☐

    Retailers ☐

    Others ☐

15. Source of purchase and cost involved in purchase

Sl.no	Actor	Source of information about the seller	Quantity purchased	Price / Kg	Mode of payment	Frequency of making purchase
1.	Farmers					
2	Wholesalers					
3.	Retailers					
4.	Processors					
5.	Farmers club					
6.	Private					

	agencies (middle man)					
7.	Others					

16. Are you aware of value added products of Chengalikodan or nedunenthran? Y/ N

17. Value added products of Chengalikodan or nedunenthran:

Sl no	Products	Quantity of purchase	Price / kg or price / qty
1	Nenthran banana		
2	Chips		
3	Pazam pori		
4	Nenthran powder		
5	Banana pulp		
6	Banana wine		
7	Dried banana		
8	Banana vinegar		
9.	Banana figs		
10.	Others		

18. Rank the determinants towards Chengalikodan / nedunenthran:

Sl.no	Attributes	Rank
1.	Price	
2	Freshness	
3	Nutrient value	
4	Hygiene	
5	Taste	
6	Organic nature	
7	Easy to use	
8	Quick to prepare	
9	Family preference	
10	Snack	

11	Safety	
12	Local grown	
13	Convenient to use	
14	Product is consistently the same.	
15	Others	

19. Attitude towards Chengalikodan / nedunenthran:

Sl.no	Statements	Chengalikodan					Nedunenthran				
		SA	A	NO	DA	SDA	SA	A	NO	DA	SDA
1.	It is less perishable.										
2.	It is nutritious compared to other fruits.										
3.	These varieties are chemical free.										
4.	Believes that origin from locally grown.										
5.	Convenient to use.										
6.	It needs less time to purchase.										
7	Eating fruits in each day is enjoyable.										
8	These varieties taste is good.										
9	Banana is an appetizing.										
10	Product is consistently the same.										
11	Others....										

(SA- strongly agree, A- agree, NO- no opinion, DA- disagree, SDA- strongly disagree)

20. Level of consumer satisfaction towards Chengalikodan / nedunenthran:

Sl.no	Statements	Chengalikodan					Nedunenthran				
		HS	S	NO	DS	HDS	HS	S	NO	DS	HDS
1	Price										
2	Taste										
3	Nutrient value										
4	Freshness										
5	Hygiene										
6	Availability										
7	Chemical pesticide free										
8	Shelf life										
9	Others ……										

(HS- highly satisfied, S- satisfied, NO- no opinion, DS- dissatisfied, HDS- highly dissatisfied)

21. Constraints in purchasing nedunenthran / Chengalikodan

sl.no	Statements	Chengalikodan			Nedunenthran		
		MF	MDF	LF	MF	MDF	LF
1	Non- availability of required quantity.						
2	Non - availability of good quality of the product.						
3	Timely availability of product.						
4	Less shelf life of the product.						
5	High price						
6	Others						

(MF- mostly felt, MDF – moderately felt, LF- least felt)

22. Suggestions, if any……

ANNEXURE

Annexure I Farmers

Cost involved for inputs by farmers

Particulars	Converted to Acre		Converted to Kilogram	
	Chengalikodan (₹./ Acre)	Nedunendran (₹./ Acre)	Chengalikodan (₹./ Kilogram) (Production 388500 kg)	Nedunendran (₹./ Kilogram) (Production 292975 kg)
Land:- (after depreciation)				
1. Imputed land cost	371250	233100	0.95 (4.84)	0.79 (4.3)
2. Leased land rent	0	94500	0	0.32 (1.75)
Suckers:-				
1. Imputed suckers	719400	17600	1.85 (9.4)	0.06 (0.32)
2. Purchased suckers	0	396900	0	1.35 (7.40)
Fertilisers	1955450	1295275	5.0 (25.4)	4.42 (24.2)
Support stick:-				
1. Bamboo	2376000	1866000	6.11 (31.1)	6.36 (34.8)
2. Choola	0	537000	0	0.18 (0.98)
Hired labours	171000	135975	0.44 (2.24)	0.46 (2.52)
Insurance	5100	75600	0.01 (0.050)	0.25 (1.37)
Machinery (motor pump after depreciation)	646650	535500	1.66 (8.46)	1.40 (7.67)
Maintenance charge	40000	30000	0.10 (0.50)	0.10 (0.54)
Credit (interest on loan)	1357000	745000	3.49 (17.7)	2.54 (13.9)
Total cost			**19.61**	**18.23**

Input transaction cost of farmers

Particulars	Converted to Acre		Converted to Kilogram	
	Chengalikodan (₹./ Acre)	Nedunendran (₹./ Acre)	Chengalikodan (₹./ Kilogram)	Nedunendran (₹./ Kilogram)
Suckers	0	20240	0	0.06 (20.6)
Fertilsers	56940	56350	0.14 (73.2)	0.04 (13.7)
Supporting stick	19875	13170	0.051(26.7)	0.19 (65.5)
Total cost			**0.191**	**0.29**

Marketing cost of farmers

Particulars	Converted to Acre		Converted to Kilogram	
	Chengalikodan (₹./ Acre)	Nedunendran (₹./ Acre)	Chengalikodan (₹./ Kilogram)	Nedunendran (₹./ Kilogram)
Transportation cost	785800	266570	2.02	0.90
Loading / unloading	464900	0	1.19	0
Total cost			**3.21**	**0.90**

Annexure II Wholesalers

Cost incurred by wholesalers (Chengalikodan)

Particulars	Cost (₹)	Converted to Kilogram
Land and building	24975	0.085
Electricity bill for one month	3100	0.010
Furniture	57150	0.195
Weighing machine	197100	0.67
Total cost		**0.96**

Cost of sales by wholesalers (Chengalikodan)

Particulars	Cost (₹)	Converted to Kilogram
Labours (Unloading)	212200	0.68
Labours (sales)	192000	0.65
Total cost		**1.33**

Annexure III SKS

Cost incurred by SKS

Particulars	Cost (₹)	Converted to Kilogram
Land and building	22500	0.76
Electricity bill	4000	0.013
Furniture	27000	0.09
Weighing machine	23400	0.079
Total cost		**0.942**

Annexure IV Retailers

Investment cost

Particulars	Converted to Acre		Converted to Kilogram	
	Chengalikodan (₹./ Acre)	Nedunendran (₹./ Acre)	Chengalikodan (₹./ Kilogram)	Nedunendran (₹./ Kilogram)
Land and building	6975	14895	0.140	1.35
Electricity bill	1425	1737.5	0.028	0.157
Furniture	31050	19575	0.62	1.77
Weighing machine	40500	52450	0.81	2.37
Total cost			**1.598**	**5.647**

Procurement cost by retailers

Particulars	Converted to Acre		Converted to Kilogram	
	Chengalikodan (₹./ Acre)	Nedunendran (₹./ Acre)	Chengalikodan (₹./ Kilogram)	Nedunendran (₹./ Kilogram)
Transportation cost	349500	102100	7.0	9.2
Labours (loading/ unloading)	11200	17300	0.22	1.56
Labours (sales)	12400	34250	0.24	1.55
Total cost			**7.46**	**12.35**

Labour charge calculation of Chengalikodan given by farmers

Full period = 12 months

3 months = 31 days (2 months starting + 1 month harvesting)

8 hours = ₹ 750. 3* 31 = 93 days = 93 * 750 = ₹69750.

9 months = 30 days. 30 * 9 = 270 days (one day = 4 hours)

270 * 4 = 1080 hours 1080/ 8 = 135 days

135 * 750 = ₹101250.

Therefore, total labour cost for 12 months = ₹101250 + ₹ 69750 = ₹171000.

Labour charge calculation of nedunendran given by farmers

Full period = 12 months

3 months = 31 days (2 months starting + 1 month harvesting)

8 hours = ₹ 700. 3* 31 = 93 days = 93 * 700 = ₹65100.

9 months = 30 days. 30 * 9 = 270 days (one day = 3 hours)

270 * 3 = 810 hours 810/ 8 = 101 days

101 * 700 = ₹70875.

Therefore, total labour cost for 12 months = ₹65100 + ₹ 70875 = ₹135975.