MARKETING PROBLEMS OF COCONUT INDUSTRY IN KERALA
A STUDY WITH FOCUS ON THE ROLE OF COCONUT DEVELOPMENT BOARD

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By

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CERTIFICATE

Certified that the thesis entitled **MARKETING PROBLEMS OF COCONUT INDUSTRY IN KERALA, A STUDY WITH FOCUS ON THE ROLE OF COCONUT DEVELOPMENT BOARD**, is a record of the bonafide work of **Mr. Moideenkutty C.H. (Cholasseri)** under my supervision and guidance.

It is further certified that Mr. Moideenkutty C.H. (Cholasseri) has not submitted this work to any another university for the award of any other degree.

He is allowed to submit this thesis for the award of the degree of Doctor of Philosophy of the University of Calicut.

Dr. E.P. SAINUL ABIDEEN

DECLARATION

I, Moideenkutty C.H. (Cholasseri), do hereby declare that the thesis entitled **MARKETING PROBLEMS OF COCONUT INDUSTRY IN KERALA, A STUDY WITH FOCUS ON THE ROLE OF COCONUT DEVELOPMENT BOARD** is a bonafide record of the research work done by me and that no part of this thesis has been presented earlier by me for the award of any degree, diploma, associateship, fellowship or other similar title of any other institution.

C.U. Campus,
Date: 21.03.05

MOIDEENKUTTY C.H. (CHOLASSERI)

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Moideenkutty C.H. (Cholasseri)

CONTENTS

LIST OF ABBREVIATIONS USED

C.D.B.	:	Coconut Development Board
C.P.C.R.I.	:	Central Plantation Crops Research Institute
I.F.S.	:	Integrated Farming System
K.A.U.	:	Kerala Agricultural University
M.S.P.	:	Minimum Support Price
P.S.S.	:	Price Support Scheme

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CHAPTER I

INTRODUCTION

Coconut tree, widely known as 'Nariyal' in most part of India is a tree of great industrial importance. Coconut palm is an important horticultural crop cultivated by small and marginal farmers scattered mainly in 18 states and 3 union territories in India. Each and every part of the coconut tree is used in India in one way or other and the classics of India have rightly eulogised it as 'Kalpa Vriksha meaning 'the all giving tree'. Coconut has a unique status in all religious and social functions throughout the country and has become a symbol of Indian culture and national unity.

Significance of the study

In India the coconut sector plays a significant role in poverty alleviation and employment generation especially among the weaker sections of the society. The industry provides livelihood to about more than 10 million farm families. Among the major coconut growing states in India, Kerala has the longest history of coconut cultivation. Other major coconut growing states are Tamil Nadu, Anthra Pradesh and Karnataka. These four states together account for about 90 per cent of the coconut production in India. The share of Kerala alone comes to about 45 per cent. Kerala's economy is

dependent on coconut to a significant extent. Nearly 15 per cent of the state's annual income is derived from the coconut sector.

Among the traditional coconut based industries, maximum labour potential exists in coir industry. Coir, the versatile fibre, besides providing employment to a large number of women, earns foreign exchange of more than 25 crores annually by export of various coir products. The different stages of coir processing like retting, defibering, spinning and packing are mostly labour intensive. In Kerala around 4 lakhs people are employed in coir industry, of whom nearly 80 per cent are women workers.

Copra making is another coconut based traditional industry in Kerala. It is a labour oriented small- scale industry. Most of the copra making units are adopting traditional methods of copra processing. There are about 12000 copra making units in India spread over the southern states of which about two thirds are concentrated in Kerala.

Coconut oil extraction industry or simply 'coconut oil industry' is another major traditional component of the coconut sector. The prices of raw coconuts and copra in Kerala are determined mainly by the demand for coconut oil.

Toddy tapping is yet another traditional area where about 1.20 lakhs Keralites are employed. It is also a labour intensive coconut based industry.

Statement of the problem

In Kerala, because of the predominance of small holdings and the highly decentralised nature of production, the producer has very little control over the marketing of coconut. Harvesting and assembling of the produce is done by a large number of petty traders or intermediaries who process coconut into copra and sell it to oil mills scattered all over the state. These mills, in turn, sell oil to large wholesalers as well as to retailers for local distribution. It is estimated that nearly 52 per cent of milling copra produced in Kerala is locally crushed and the remaining 48 per cent is moved as copra to the markets outside the state like Mumbai, Culcutta etc. These buyers in those markets are big oligopolies with large market power and are in a better position to influence the prices.

Although Kerala accounts for nearly 80 per cent of the total number of crushing units in the country, the crushing capacity is only 52 per cent But Maharashtra, with only 8 per cent of the number of units, accounts for 34 per cent of the total crushing capacity and hence, is able to effectively control the market for coconut oil in all the major markets. It is significant to note that the coconut oil prices in Kochi and Alappuzha are directly influenced by the market trends in Mumbai. Oil prices in Mumbai are always higher than in Kochi and the margin is always higher than the cost of transportation. Such

price differentials and absence of market integration are clear evidence of an imperfect market structure tending towards oligopsony.

Thus, it is clear that, even though Kerala enjoys a unique position among the coconut growing states of India, with the largest production and superior nut quality, the highest oil content, to the utter disappointment of the farmers, here, on the marketing side, they face acute problems which disturb the economic equilibrium of the rural economy of Kerala. The 'acrobatic' nature of coconut prices, particularly during good harvest seasons is a real blow to the cultivators. In addition to violent market fluctuations, it is subjected to vagaries of nature and sudden outbreak of pests and diseases .

Moreover, consequent to the globalisation of the Indian economy, the coconut industry in India is now opened for global competitiveness. In view of the economic liberalisation and being a member of the W.T.O, certain macro and micro level changes are expected to take place in Indian agriculture. In the case of coconut and its products, India is in a disadvantageous position since the domestic prices of these commodities are higher than the international prices. In a free trade regime after 2000 A.D,. Indian entrepreneurs in the coconut industry may import these products from other competing countries, which could drastically affect the domestic prices of coconut and its products. This, in turn, would reduce the profitability of

coconut cultivation in the country, which is already bedeviled by escalating input cost, threat from diseases and stagnant price realization.

In Kerala, most of the coconut holdings are of small and marginal category. The role of farmers is significantly less in processing and marketing. There is multiplicity of interactions and involvement of large number of functionaries/intermediaries who exploit the producers. The producer-seller continues to be the weakest link in the chain. There is considerable scope for improvement of infrastructure management and facilitating services including market intelligence, credit etc to make the system favourable to the farmers.

Objectives of the Study

Most of the earlier research studies on coconut were with focus on production aspect with near total neglect of post-harvest processing and appropriate marketing mechanism. The aim of the present study is to identify the various problems mainly at cultivators level in marketing their produce after harvest.

The study also aims at, to know, to what extent the coconut cultivators in Kerala adopt value addition at farm level itself and to examine, in depth, the real problems faced by them in the marketing of their produce. It aims at examining how far the product diversification attempts in coconut sector have

been successful and also to examine the consumption pattern of coconut and its products among the keralites. The specific objectives of the study were:

1. To examine the pattern and recent trends in coconut production in Kerala.

2. To analyse the consumption pattern and awareness among people about various new products from coconut in Kerala.

3. To examine the nature and types of trade in coconut and its products in Kerala.

4. To examine the extent of value addition undertaken by coconut cultivators at farm level itself and the adoption level of new techniques of farming such as inter cropping/mixed farming practices and the nature of institutional support obtained by the cultivators from organisations like C.D.B.

5. To make an in-depth analysis of marketing problems of coconut at the cultivator level in Kerala.

6. To have a peep into the role and functioning of the Coconut Development Board.

7. To suggest remedial measures.

Review of Literature

Davis (1962) studied about the problems and prospects of tender coconuts harvest in which he analysed the various aspects of harvesting tender nuts vis-a-vis mature nuts. This was a useful study in that, it discussed the economics of tender nut harvest.

Gosh (1962) also studied about the problems of tender coconut harvest and stressed the need for utilising discarded husk of empty nuts. This again was a useful study as it highlighted that, a good amount of potash can be squeezed out of the thrown nuts and can be utilised as manure for coconut gardens.

Pandalani and Marar (1966) in a study through a reference to the work of Shri. S.R.K. Menon, has pointed out that the green husk from tender nuts could be made use of for manufacturing artificial leather by pressing them hydraulically between heated plates. This was a useful study in the context of product diversification and by-product utilisation efforts in the industry.

Bhaskaran Unnithan. K (1968) in his Ph.D thesis submitted to the university of Kerala attempted to analyse the existence of intermediaries at various stages of coir production. He identified two sectors in coir industry - the processing sector and the manufacturing sector. The processing sector consists of retting, spinning etc and the manufacturing sector consists of the production of a variety of coir goods. The processing sector is labour-

intensive cottage industry and so less organised whereas the manufacturing sector is more or less mechanised industry and more organised. It was a useful study in that it highlighted the intensity of labour in the industry.

Nelliat and Krishnaraj (1976) attempted to analyse the employment potential of the coconut industry and found that coconut as a monocarp provides employment only for about 150 man days per hectare per year under rain fed conditions and consequently the family labour remains unemployed for larger part of the year. The study helped to unearth various problems of labour engaged in the industry.

Jacob Mathew (1978) studied about the trend and fluctuations in the prices of coconut and coconut oil in his thesis submitted to the Jawaharlal Nehru University, New Delhi. He analysed the long term movements in prices in selected markets, price trends in Kerala, short-term fluctuations in price etc. He pointed out that while Alappuzha and Kochi market prices for coconut oil were always on par, Mumbai prices were always higher by 5 to 10 per cent and this was mainly because of the freight charges. He concluded by adding that the per capita production of major oil seeds like groundnut, linseed, rape seed mustard, sesamum and castor seed had no influence on coconut oil prices. This study was a useful one as it concentrated on the marketing aspect of the industry.

Kuttappan. M. (1979), studied about the coconut situation in Kerala, the economics and importance of coconut, producers' response to price changes, profitability of coconut cultivation in relation to paddy and tapioca. He also examined the factors determining coconut production in Kerala. Though the study concentrated more on the production side, it was a useful study in that it highlighted the market potential of coconuts and its products in relation to other agricultural produce of the state.

Suseelan. P. (1986), Department of Agriculture, Trivandrum, conducted a study titled 'problems and prospects of coconut production' in which he examined the various production problems of the industry.

Hameed Kutty P.K (1986) studied about marketable surplus and seasonal flow of coconut production. This study was a useful one as it attempted to analyse the peak season and off-season variations in prices of coconut.

Thampan P.K (1988) studied about the area (acreage), size of holdings etc of coconut cultivation in Kerala. Though the study had no notable contribution to marketing side, it threw a considerable amount of light on the production aspect of the industry.

Narayana.D. and others (1991) in a study titled 'Coconut Development in Kerala' examined the profile of the industry from two important dimensions. Firstly, it was a study dealing with production, consumption,

price formation and technology of cultivation. Secondly, it was an evaluation of the credit schemes for the rejuvenation of the crop refinanced by the NABARD (National Bank for Agriculture and Rural Development). Nevertheless, the study failed to attempt on marketing and product diversification aspects.

Mishra, Srijith (1993) in his thesis submitted to the C.D.S (Centre for Development Studies), Trivandrum, attempted to analyse, how social interactions, particularly exchange relationships in tribal economy among various categories of land holders creates an inter locking of market. The households, with small holdings and low family labour entered into exchange labour contracts. As against this the large size holdings depend to a large extent on hired labour and the family labour they provide is more to supervise or monitor hired labourers. He found that a cultivator, while taking loans from the trader-lender enters in to a forward trading contract for the agricultural product to be harvested. In the inter locking of markets, the trader-lenders have also developed a method of giving tied fertilizer loans which not only ensure higher production but also increases the cultivator's dependence on the trader-lender in successive periods.

Though this study concentrated on paddy cultivators in Orissa, to some extent it can be related to the coconut situation in Kerala, particularly to the

marginal holders who depend to a large extent on private money lenders for carrying on their agricultural activities.

Jacob John and Nair.M.A. (1995) of the Department of Agronomy, College of Agriculture, Kerala Agricultural University, Vellayani undertook a two-year study in the coconut based homesteads of southern Kerala to assess the light available at the floor of the home garden for the under storey crops after interception by coconut in sole stands and on inter planting with certain perennial multi-purpose trees. Though the study has direct relation with the production aspect, it can also be related to intercropping which is very significant in the context of the propaganda for increasing productivity from coconut holdings.

Anitha Kumari. P and Kalavathi. S (1997), scientists, C.P.C.R.I, Kayamkulam conducted a study among the coconut cultivators of Alappuzha district about the awareness and adoption of recommended practices by coconut cultivators of root (wilt) affected areas. The broad areas of recommendations considered were nursery management, planting in main field, nutrient management, management of pests and diseases, biological control of pests, moisture conservation measures and post harvest technologies. This study emphasized the need for intensive awareness-creating activities and sincere transfer of technology efforts. This study was a useful one in that, it stressed the need for post harvest technologies which

help in value addition, reduce post harvest losses and help diversify consumption, thereby widening the market.

Shekar. I. (1997) of Indian Agricultural Research Institute, New Delhi conducted a study about the huge loss from a tiny weevil in coconut. The study brought to light the severity of economic loss due to pest infestation in coconut gardens.

Sairam. C.V. and others (1999), of C.P.C.R.I, Kasargod, in a study under the title 'A comparative analysis of production and prices of coconut oil with other major vegetable oils in India', attempted to analyse the price behaviour of coconut oil in relation to other major edible oils. They found that coconut oil always command a premium price over other vegetable oils. The price premium (absolute differences of the average annual wholesale prices of individual oils from that of coconut oil) was higher during certain periods. This could be explained by distinct advantages enjoyed by coconut oil over other oils in certain end uses.

Markose V.T and others (1999), of Coconut Development Board, Kochi conducted a study a make a quantitative analysis of mature coconuts from the major states of India. Even though the study concentrated more on production aspect, the findings were quite useful as it brought to light many of the nut characteristics of coconuts produced in different states of India, particularly with regard to weight of nut, husk, copra content, water quantity,

oil content etc. A conversion table of coconut from important producing states was prepared and the conclusion was that coconuts produced in Kerala far outshine coconuts of other producing states in majority of the nut characteristics.

Sindhurani. J.A and Rajmohan.T (1999), of the University of Kerala, in a study analysed the effect of dietary fiber from coconut kernel on cholesterol metabolism. This study was a useful one in the context of the propaganda against coconut oil that it is a major source that increased cholesterol level in humans and thus promote cardio vascular diseases. The study showed that the neutral Detergent Fiber from coconut kernel has significant cholesterol lowering action.

Maheswarappa. H.P and others (1999), of the C.P.C.R.I, Kasargod conducted a study on coir pith and its use in poultry farm. The study proved that coir pith, which was hitherto considered as a waste material, could be used as a bedding material in homestead poultry farms. Analysis was made for coir pith enriched with poultry droppings for its composition with respect to manurial value.

Muralidharan. K and others (2000), conducted a study on the incidence and yield loss due to Eriphyid Mite on coconut in Alappuzha district. Though the study was production-oriented one, it brought to light the severity of loss due to mite attack in the entire state and invited governmental action to

control pest. The study revealed that 143.08 million nuts out of the then forecasted production of 366.31 million nuts were of no economic value, due to this mite attack. In terms of copra, the loss was 30.94 per cent and 41.74 per cent loss in total husk production.

Ramakumar. R. and Sundaressan.P (2000) studied about the price behaviour of coconut and its products in Kerala markets and identified the distortions. They found that there existed a free flow of market information between markets. Though earlier studies have argued about the existence of exploitative middlemen, the results of this study showed that there is minimum distortion in the transmission of prices and market information in the state. But the same was not the case in the trading of coconut and coconut oil between Kerala and the outside market, Mumbai, which is the major oil seed market in India. It was found that there existed a big difference between the prices in the two markets, though the actual cost incurred in the transportation between the markets plus other actual costs formed only a small percentage of it. This indicated the high degree of exploitative propensities prevailing in the coconut sector. Substantiating this argument was the finding that the prices of coconut oil in the two markets were not spatially integrated, reflecting the distortions in the operation of markets in interstate trade. This study was useful one as it highlighted a very important marketing problem of the coconut industry

Palomar.R.N. and others (2001), Researchers of Philippines Coconut Authority, in a paper presented at the A.P.C.C. 38th Coco tech meeting held in HochiMinh City, Vietnam from 17th to 21st July 2001, attempted to analyse the increasing farm income through processing and utilisation of coconut waste products. It suggested ways of industrial use of various residue materials from coconut palm such as husk, spathe, peduncle, petiole, leaves with midribs and leaf sheaths. In the context of by-product utilisation efforts, this study was a useful one.

Methodology

The study is primarily a descriptive one based on survey method. Required information was collected from both secondary and primary sources.

Secondary data

The secondary data used for the study have been obtained from various sources such as:

1. Annual Reports of Ministry of Agriculture and industries of Kerala and Central Governments.
2. Plan documents of both central and state governments.
3. Statistics for planning by the Directorate of Economic and Statistics, Thiruvananthapuram.

4. Different Encyclopedia.

5. Records of Coconut Development Board, Kochi.

6. Coconut Statistics, CDB, Kochi.

7. Journals, especially the Indian Coconut Journal, published by the coconut Development Board, Kochi.

   'Kerala calling' published by the Public Relations department, Government of Kerala.

8. Reports and working papers obtained from the centre for Development Studies, Thiruvananthapuram.

9. 'The Farm Guide', various volumes; published by the Farm Information Bureau, Government of Kerala.

10. Records of related organisations like Kerafed, Coirfed, Coir Board, Kerala Agricultural University Departments, Krishi Bhavans, etc.

Collection of Primary data

The primary data was collected through direct farm visits, personal interviews with cultivators, consumers and traders. Properly designed and pre-tested interview schedules were used for the collection of primary data. A pilot study was conducted in the Perinthalmanna Taluk of Malappuram District. In the light of the pilot study, the interview schedule had to be

redrafted and restructured. Interview schedule used for cultivator survey is shown in Appendix I, that used for consumer survey is shown in Appendix II and the one used for dealer survey is shown in Appendix III.

Sample Design

Since the population to be covered was very large and spread over the entire state of Kerala, multi-stage sampling technique was adopted for the collection of primary data.

At the first stage, the whole state has been divided into three regions on geographical basis viz., North, Central and South. Such a division was almost conforming to the erstwhile Malabar, Kochi and Travancore regions.

In Kerala, the total area under coconut cultivation is estimated to be 903718 hectares*. Accordingly, the districts included in the North region and their respective ranks on the basis of area devoted to coconut cultivation are:

Districts	Area in hectares	% share of Area to state Total	Ranks
Kasargod	57285	6.34	8
Kannur	95712	10.60	3
Waynad	11383	1.26	14
Kozhikode	130100	14.17	1
Malappuram	104171	11.52	2

* Farm Guide, 2002.

The districts included in the central region and their respective ranks on the basis of area under coconut are:

Districts	Area in hectares	% share of Area to state Total	Ranks
Thrissur	85480	9.46	5
Palakkad	50568	5.60	10
Ernakulam	62684	6.93	7
Kottayam	37429	4.14	11
Idukki	25603	2.83	12

The remaining four districts were included in the south region and their respective ranks on the basis of area devoted to coconut cultivation are:

Districts	Area in hectares	% share of Area to state Total	Ranks
Alappuzha	57047	6.31	9
Pathanamthitta	22669	2.51	13
Kollam	74956	8.30	6
Thiruvananthapuram	88604	9.80	4

At the second stage, one district from each region was selected through purposive sampling so as to include those districts having more area under coconut cultivation from each region. Thus, Kozhikode district from Northern region and Thiruvananthapuram district from the Southern region were selected as sample districts. But from the central region, instead of taking Thrissur district which has the highest rank in that group, Ernakulam

district which has the next higher rank was purposefully selected because of the fact that the present study concentrates more on the functioning of the Coconut Development Board (C.D.B) whose Head office is situated at Kochi in Ernakulam district.

In the third stage, two taluks from each sample districts were selected by lottery method, totaling six taluks.

Thus the taluks emerged as samples were:

Region	District	Taluks selected
Northern	Kozhikode	Vadakara Kozhikde
Central	Ernakulam	North Paravur Kochi
Southern	Thiruvananthapuram	Chirayinkil Nedumangad

Selection of Cultivators

It was very difficult to find out the actual number of Coconut cultivators in each region. In Kerala even small households are having at least 5-10 coconut trees in the plot surrounding their dwelling units. Although a crop of commercial nature, coconut is mostly grown in homestead gardens and small holdings in Kerala. Moreover, in such pigmy holdings, it is not grown with intensive agricultural management practices. Thus,

homesteads below 25 cents of area were not considered in the selection of samples.

Taluk was taken to be the unit area for the selection of sample cultivators. From the list of cultivators who usually approach during a year for seedlings, manure, fertilisers, sprayer, pesticides, pumpsets etc obtained from various Krishi Bhavans, Grama Panchayat offices and also on the basis of discussions held with the officials of these organisations it was understood that, on an average there were 400 cultivators in each taluk doing coconut cultivation with intensive agricultural management practices. 20 per cent of this has been taken as sample ie., 80 cultivators each from all the 6 sample taluks, thus totalling 80x6 = 480 cultivators.

Utmost care has been taken to include all categories of cultivators – viz., marginal, small and big – in the sample. Cultivators with coconut holdings below one hectare of area are grouped as marginal; cultivators with holdings between one hectare and two hectares are categorised as small and those with coconut holdings above two hectares of area are termed as big cultivators. The holding size wise break-up of cultivators was as below:

Region / Category	North	Central	South	Total
Marginal	52	52	52	156
Small	56	56	56	168
Big	52	52	52	156
Total	160	160	160	480

Selection of Consumers

Grama Panchayat or Municipal/Corporation ward was the unit area for the selection of consumers. From the six taluks selected for cultivator level survey, one Grama panchayat and one Municipality (or corporation if any) were selected at the fourth stage. For the selection of Grama panchayats, lottery method was followed but for the selection of Municipality or Corporation, purposive sampling technique was adopted because there were no sizable number of municipalities or corporations in all the selected taluks.

A ward is chosen from each selected Grama Panchayat or Municipality (or Corporation) at the fifth stage by lottery method, totaling 12 wards. The details of the selected Grama Panchayats, Municipalities (or Corporations) and their respective wards were as follows:

List of selected Grama panchayats, Municipalities/Corporations & their respective wards

Region	District	Taluks	Panchayat	Municipalities	Corporation	WARD NO.		
						Panchayat	Muncipalities	Corporation
North	Kozhikode	Vadakara	Vilyapalli	Vadakara	-	7	6	-
		Kozhikode	Ramanattukara	-	Calicut	10	-	4
Central	Ernakulam	N. Paravoor	Chennamangalam	N. Paravur	-	3	2	-
		Kochi	Edavanakkad	-	Kochi	12	-	8
South	Trivandrum	Chirayinkil	Anchuthengu	Chirayinkil	-	7	8	-
		Nedumangad	Aruvikkara	Nedumangad	-	3	5	-

Upon verification of the Voters Lists obtained from concerned authorities (ie Grama panchayat offices, Municipal offices and Corporation offices), it was found that on an average 500 households were there in a ward. 10 per cent of that (ie 50) was taken as sample households from each ward - thus totaling, 12x50 = 600 households were selected at random for the study. Households selected from Grama panchayat wards were treated as Rural households and those selected from Muncipal/Corporation wards were treated as Urban households.

The region-wise break-up of the sample households was as follows:

Region	Number of Households		Total
	Urban	Rural	
Northern	100	100	200
Central	100	100	200
Southern	100	100	200
Total	300	300	600

From each selected household, that individual who makes the purchase decision in the family was interviewed (not necessarily the senior most person of the household). Such respondents comprised both men and women of different age groups.

Income of the household was taken to be the main criteria for classifying the households. Great care has been exercised to include at least

20 percent from all categories of Income groups in the sample households. The actual income-wise break-up was as follows:

Income-wise selection of respondents (households)

Income Rs.	Northern	Central	Southern	Total	%
A-upto 2000	56	56	56	168	28
B-2001-5000	58	58	58	174	29
C-5001-10,000	44	44	44	132	22
D-Above 10,000	42	42	42	126	21
Total	200	200	200	600	100

Accordingly, 56 households from each region was selected in the A group, 58 households from each region in B group, 44 households from each region in C group and 42 households from each region in D group. The logic behind selecting these numbers is the researcher's own experience, while conducting the pilot study, that more people in Kerala belong to lower income groups.

Gender wise break-up of the respondents from various households was as follows:

Gender wise break-up of respondents from various households

Taluk	NORTHERN				CENTRAL				SOUTHERN				Total
	VADAKARA		KOZHIKODE		KOCHI		NORTH PARAVUR		CHIRAYINKIL		NEDUMANGAD		
Ward	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	
Male	30	38	29	33	24	27	28	31	28	31	27	29	355
Female	20	12	21	17	26	23	22	19	22	19	23	21	245
Total	50	50	50	50	50	50	50	50	50	50	50	50	600

Selection of Traders

In order to study the nature of trade and type of demand for tender coconuts prevailing in the state, a representative sample of sales outlets in tender coconuts had to be chosen from the three regions. For this purpose, district was taken to be the sampling area.

It was very difficult to collect the actual number of traders having sales outlets in a district. However, it was understood that there were mainly three categories of outlets dealing in tender coconuts – viz., Elaneer Pandals, Cool bars and Hawkers on highway roadsides.

In the case of Elaneer Pandals, the Coconut Development Board used to grant license and assistance to entrepreneurs to start them as part of its extension activities. So, to select a representative sample of Elaneer Pandals, the researcher had discussions with the officials of the Board and came to know that, since its inception, the Board had given licenses and assistance only to limited number of entrepreneurs; their number not exceeding 300 throughout the state. Later on, many entrepreneurs had started Elaneer Pandals on their own, inspired by the publicity programmes of the Board, but without registering with it.

Even in the case of Elaneer Pandals which were started under the Board's license and assistance, many of them were defunct. There were no monitoring and follow-up measures adopted. So, there was no data available

regarding the exact number of Elaneer Pandals existing in the state. It was also known from the discussions with the officials of the Board that, premises of bus stands and hospitals are the main locations where entrepreneurs usually set up Elaneer Pandals.

In the case of cool bars and hawkers too, there was no exact data available regarding their number in a district. Since all the cool bars were not offering tender coconut for sale, only those cool bars offering tender coconuts had to be identified first. Hawkers in tender coconuts are mostly seen on highway roadsides.

Thus, after travelling extensively by the researcher throughout the three sample districts, and having consultations with the owners of some of the Elaneer Pandals, cool bars and Hawkers, the total number of the three categories of outlets in each sample district was found to be around 100 as shown below:

Type of outlet	Sampling districts		
	Kozhikode	Ernakulam	Thiruvananthapuram
Elaneer Pandal	98	101	92
Cool bar (offering tender nuts)	94	97	92
Hawkers	88	92	84

Thus, with a guess estimate of their total number to be 100 in the case of each category of outlets in the three districts, 20 numbers from each

category (so as to include 20 per cent), totaling 180, were selected representing the three regions of the state, as detailed below.

Type of Trader	North	Central	South	Total
Elaneer Pandal	20	20	20	60
Cool bars	20	20	20	60
Hawkers	20	20	20	60
Total	60	60	60	180

For the purpose of the present study, the Elaneer pandals, cool bars and hawkers are collectively called 'stalls'.

In addition to serving interview schedules, intensive discussions with the employees and officials of various related organisations were also conducted wherever necessary.

Tools of analysis of data

For the analysis and interpretation of data statistical tools like Averages and Correlation and mathematical tools like percentages and ratios were made use of.

For the presentation of data, diagrams and charts are used.

Period of study

A period covering 10 years from 1992-93 to 2001-02 was selected for the present study.

Study plan

The study is presented in seven chapters. The first chapter sets out significance of the study, objectives of the study, statement of the problem, review of literature, methodology and limitations of the study. The second chapter highlights the production pattern of coconut in India and in the state of Kerala. The third chapter includes the consumption pattern of coconut and its products. The fourth chapter covers the trade in coconut and its products. The fifth chapter is designed for discussing the various problems faced by the coconut cultivators in the state of Kerala in marketing their produce. The sixth chapter depicts a peep into the role and functioning of the Coconut Development Board. The seventh and last chapter contains summary of findings and suggestions for the improvement of the coconut industry on the basis of this study.

Limitations of the study

Since the study was to be conducted among a large population, there might have occurred limitations in the adoption of sampling process. One of the limitations of social science research is that, since the nature and behaviour of human beings are different in different circumstances, the respondents would not have furnished true information while they were interviewed. For instance, many of the farm holders, consumers of coconut and its products from different households, especially those belonging to rural

areas and traders were less educated or illiterate people. Moreover, while conducting the cultivator level survey, though the researcher had visited almost all the sample farms in person, it was not possible to go to the interior parts of some of the plots, particularly on account of the peculiar topography of the areas. In such cases, whatever has been stated by the respondents, especially in the matter of inter cropping/mixed farming systems, had to be taken for granted. All these have posed difficulties in the collection of primary data.

Nevertheless, the researcher had toiled hard to rectify the limitations as far as possible.

CHAPTER 2

PRODUCTION PATTERN OF COCONUT

Coconut (*Cocos nucifera* L.) is a monotypic species of pan tropical distribution between 20°N – 20°S latitude. The coconut, considered to be the most important and useful of the tropical palms, has been in cultivation in India from time immemorial.

Antiquity of Coconut in India is well established from its mention in 'Kishkinda Kanda' and 'Aranya Kanda' in Valmiki Ramayana (3000 B.C). There are three different views regarding the origin of coconut. According to the first, the palm evolved from a stock which gave rise to the American members of the genus 'Cocos' and originated in the northern end of the Andes in tropical America from where it was taken to the Pacific. The second view is that from a place of origin on the coast of central America, the equatorial currents of the sea took it to the Pacific Islands. According to the third, which is more generally accepted, it is assumed to have originated in the South Asia or in the Pacific from where it reached America.

Coconuts are not mentioned in the Bible. References have been made in the 'Reghuvamsa' of Kalidasa and Sangam literatures, which testify the antiquity of coconut in India. But its origin in India remains disputed. Marcopolo, the famous European traveller who visited India in the 13th

century called coconut 'the Indian nut' and the logic for such a reference needs investigation by historians.

Whatever be the disputes regarding the origin of coconut, over the centuries coconut came to be introduced to many tropical countries and today it is grown in nearly 93 countries spread over in many continents as shown in table 2.1.

TABLE 2.1

World-region wise Area and production of Coconut

Region	Area ('000 ha)	Production ('000 mts)
Asia	10,303	43322563 (84.64)
Pacific	678	2288500 (4.47)
Africa	653	2250875 (4.40)
America	558	3319091 (6.49)

Source: Indian Coconut Journal.

As can be noted from table 2.1, Asia dominates the world coconut industry, accounting for nearly 85 per cent of production. It was the advent of colonial powers that changed the status of coconut, once a subsistent crop to a commercial one. Use of coconut oil in the production of soap and margarine in the early 19th century in Europe saw an unprecedented demand for it resulting in large scale planting of coconut in the colonies sometimes even

under threat of punishment to indigenous people.[1] This could be the reason for expansion of coconut in Asian region.

Globally, India, Indonesia, Philippines and Sri Lanka are four major coconut-growing countries, which together contributes 78 per cent of the world production (Table 2.2).

TABLE 2.2

Area, production and productivity of coconut in major growing countries

Sl. No.	Country	Area ('000) ha	Per-centage share	Production (Million units)	Per-centage share	Productivity (Nuts/ha)
1	India	1908	16.02	14925.00	27.57	7822
2	Indonesia	3712	31.17	13946.00	25.76	3757
3	Philippines	3077	25.84	10504.00	19.42	3414
4	Sri Lanka	442	3.71	2828.00	5.22	6398
5	Others	2770	23.26	11925.91	22.03	4306
	Total	11909	100.00	54128.91	100.00	4545

Source: Indian Coconut Journal

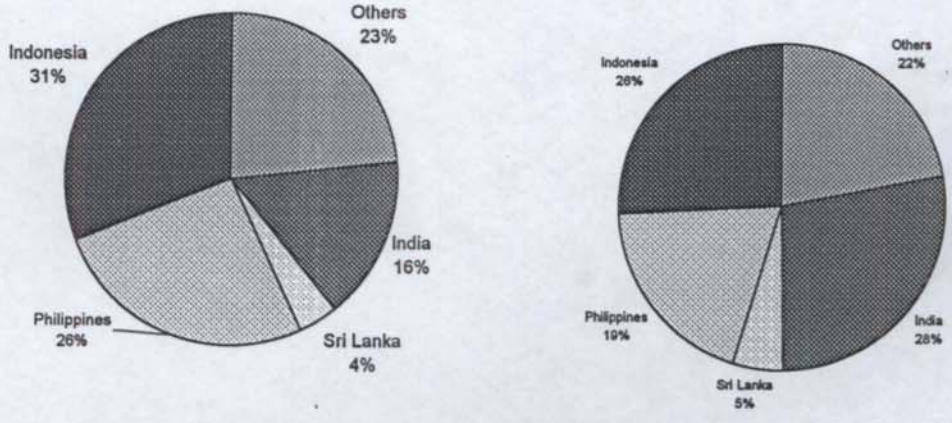
From table 2.2 it is clear that India is the largest producer of coconut with 14925 million nuts from an area of 1908000 hectares. India is closely followed by Indonesia with 13946 million nuts, but from an area of 3712000 hectares. While India accounts for 27.57 per cent of production in the world, she has only 16.02 per cent share in area. Though Indonesia ranks first in

[1] P.G. Punchihewa (Former APPCC Director, Jakarta, Indonesia), *Current Status of Coconut Industry*, Indian Coconut Journal, October – 2000, pp.1-12.

area in production she has only second place. Philippines ranks second in area (25.84 per cent) and third in production with 10504 million nuts (19.41 per cent). Sri Lanka with 442000 hectares of area (3.71 per cent) and 2828 million nuts production (5.22 per cent), occupies fourth position. Figure 2.1 also makes this clear.

Figure 2.1

Share of Major coconut growing countries in Area and Production of Coconut



Area : 11909 thousand hectare Production: 54129 million nuts

Source: Compiled from Coconut Statistics, Coconut Development Board, Kochi.

Coconut palm is one of the most important horticultural perennial crops cultivated in India for the past 30 centuries. Coconut occupies a unique position in the socio-economic life of the country and it is closely related to

the prosperity of a vast multitude of small and marginal growers, especially along the coastal states.

The crop has significant role on the national economy besides its influence on the economic, social and cultural lives of millions of small and marginal farmers who form the backbone of the coconut sector in the country. It acts as an enormous source of raw material for various small, medium and large-scale industries, particularly in those states where the crop is largely grown.

The bonded relationship between a common man and the coconut palm can be perceived from the role of coconut and its products in his social and cultural life. The crop has very few parallels in the plant kingdom because of its multifaceted uses in our every day life.[2]

An overview of the production of Coconut in India showed a sharp decline in the fifties and sixties. But the seventies and eighties showed stagnancy and sluggish growth in production. Production of coconut which showed a 70 per cent increase over the 20 year period between 1950 and 1970 showed practically no increase during the seventies followed by a paltry 15 per cent increase till 1986. Although it is not quite meaningful to decompose the changes in production in terms of area effects and productivity effects in

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[2] V.T. Markose, "Fifty years of Coconut Development", *Indian Coconut Journal*, Aug. (1999), p.38.

the case of a tree crop like coconut with long gestation period, it may be observed that productivity of coconut palm has not shown any systematic increase over this long period.[3]

Productivity per hectare which was 5758 nuts in 1950-51 increased to 6470 nuts by 1960-61 and showed a steady decline since then. By the triennium ending 1987-88, productivity has reached 5332 nuts which was well below the 1950-51 level. Thus, it may be inferred that the increase in production have come entirely because of increases in area under bearing trees. Area increase between 1950 and 1970 was roughly 68 per cent, practically insignificant between 1970 and 1980 and was 20 per cent between 1980 and the triennium ending 1987-88.[4]

In India, coconut is now grown under varying soil and climatic conditions in 17 states and 3 union territories. It is versatile in its adaptability to a wide range of soil conditions. From the west coast of India, it has now spread to interior areas.

Despite such a great importance, this versatile tree is still mainly grown in the four southern states viz. Kerala, Tamil Nadu, Karnataka and

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[3] D. Narayana & others, *Coconut Development in Kerala.* Centre for Development Studies, Trivandrum, 2001, p.8.

[4] *Ibid.*, p.9.

Andhra Pradesh. These four states together shares 91-92 per cent of the total production and area in the country.

TABLE 2.3

INDIA: Area and Production of Coconut by States, 2001/2002

States	Area		Production		Productivity
	Ha 000	%	Million Nuts	%	Nuts per hectare
Andhra Pradesh	104.00	5.50	1,129.1	8.88	10857
Assam	21.10	1.12	163.6	1.29	7754
Goa	25.00	1.32	125.1	0.98	5004
Karnataka	373.70	19.75	1,523.4	11.97	4077
Kerala	939.50	49.65	5,744.0	45.15	6114
Maharashtra	16.80	0.89	193.8	1.52	11536
Orissa	17.30	0.91	142.4	1.12	8231
Tamil Nadu	335.80	17.75	3,293.6	25.89	9808
Tripura	3.30	0.17	7.0	0.06	2121
West Bengal	25.60	1.35	231.6	1.82	12953
A & N Islands	25.20	1.33	89.6	0.70	3560
Lakshadweep	2.70	0.14	53.1	0.42	19667
Pondicherry	2.30	0.12	25.3	0.20	11000
Total	1,892.3	100.0	12,721.6	100.0	6776

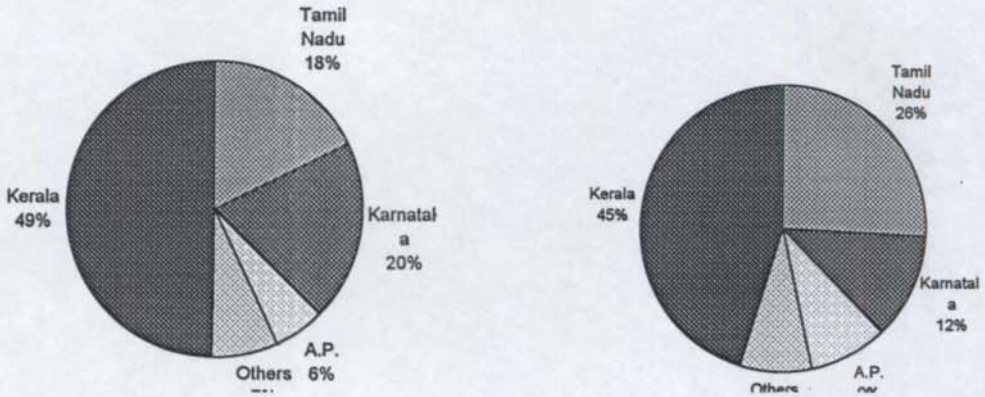
Source: Coconut Development Board

As can be seen from Table 2.3 among the major coconut producing states in India, Kerala accounts for the largest area and production with 49.65 per cent of area and 45.15 per cent of production. It is also depicted in Figure 2.2. Tamil Nadu occupies the second position with an area of 17.75 per cent

and production of 25.89 per cent. Karnataka is in the third position with 19.75 per cent and 11.97 per cent, in area and production respectively. Andhra Pradesh occupies fourth position with an area of 5.50 per cent and production of 8.88 per cent.

Figure 2.2

Share of major coconut growing states in Area and Production of Coconut



Area Production

Source: Compiled from the data of Coconut Development Board, Kochi.

Though Kerala is ahead of other coconut producing states in area and production, in the matter of productivity (nuts per hectare), she is much behind; particularly when compared to Tamil Nadu and Andhra Pradesh (Table 2.3). Among the four southern states, Andhra Pradesh tops in productivity with 10,857 mts per hectare followed by Tamil Nadu with 9808 nuts per hectare. As for Kerala, it is 6114 nuts per hectare. Karnataka has the lowest productivity, with 4077 nuts per hectare Appendix IV shows the index

numbers for area, production and productivity of coconut in three major producing states.

Coconut production in Kerala

The state of Kerala is a small, narrow strip of land on the extreme southwest coast of India, with a coast- line of 590 kms; and it does not exceed 100 kms at its widest point. It has a total area of about 38,863 square kms which is only 1.03 per cent of the land area of India. Constituted on November 1,1956, it comprises of the Malabar district in the North (which was till then part of the Madras state) the whole of the former Cochin part of Travancore – Cochin state in the centre and the major part of Travancore state in the south. Kerala is often cited as an example of a state, which has been relatively successful in implementing land reforms in terms of benefiting the land less and the small holders.[5]

Coconut sector is the backbone of Kerala's economy. The very name of the state refers to 'Land of Coconut'. The crop sustains nearly 10 million families. About 15 per cent of the states annual income comes from coconut. Coconut products earn foreign exchange to the tune of Rs.238 crores the major share being from coir and coir products.[6]

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[5] Mridul Eapen, *Industrialisation in Kerala*, Manohar Publishers, New Delhi, 2001, p.45.

[6] V.T. Markose, *Processing and Marketing of Coconut in India*, Coconut Development Board, Kochi, 2001, p.31.

Though Kerala occupies first place in area and production of coconut, recently Tamil Nadu has emerged as a competitor to Kerala in the coconut sector. Karnataka also is there in the third position, which is having the monopoly of desiccated coconut industry in the country. Nevertheless, a recent study[7] conducted by V.T. Markose and others of Coconut Development Board, Kochi has revealed that coconuts produced in Kerala possess some unique characteristics as compared to that produced in other states.

TABLE 2.4

Quantitative analysis of Coconuts from major coconut growing states

State	Nut weight (g)	Husk Wt (g)	Husked nut at (g)	Water wt (g)	Shell wt (g)	Kernel wt (g)	Copra wt (g)	Oil wt (g)	Oil % (RRL)
Karnataka	979.00	583.00	396.00	71.00	114.67	210.00	117.67	71.33	67.53
Tamil Nadu	1472.67	1001.67	471.00	93.67	131.33	246.33	125.00	78.67	68.61
Orissa	1159.67	722.67	437.00	101.67	111.33	224.00	116.67	63.67	65.10
Andhra Pradesh	1213.00	804.50	408.50	86.00	102.50	220.50	104.00	63.00	68.05
Kerala	1373.31	882.46	490.85	108.45	113.75	268.65	148.15	93.34	71.12

Source: Indian Coconut Journal: Sept. 1999.
RRL = Regional Research Laboratory.

It can be noted from Table 2.4 that, though coconuts produced in Tamil nadu is leading in the matter of nut weight, husk weight and shell weight;in all other important matters like husked nut weight, water weight, Kernel weight, copra weight, oil weight and oil percentage, coconut produced in

[7] V.T. Markose & Others, *Quantitative, analysis of Mature coconuts from the major states of India*, Indian Coconut Journal, Sept. 1999, pp.25-26.

Kerala, enjoys a distinct advantage. Detailed coconut conversion tables of Kerala, Tamil Nadu, Karnataka, Andhra Pradesh and Orissa are given in Appendices V to IX.

Coconut sector in Kerala provides income and employment for millions of households with small - holdings. Even very small households are having atleast 5-10 coconut palms in the plot surrounding their dwelling units. The area, production and productivity of coconut in Kerala from 1991-92 to 2001-02 has been shown in Table 2.5.

TABLE 2.5

Area, production and productivity of coconut in Kerala

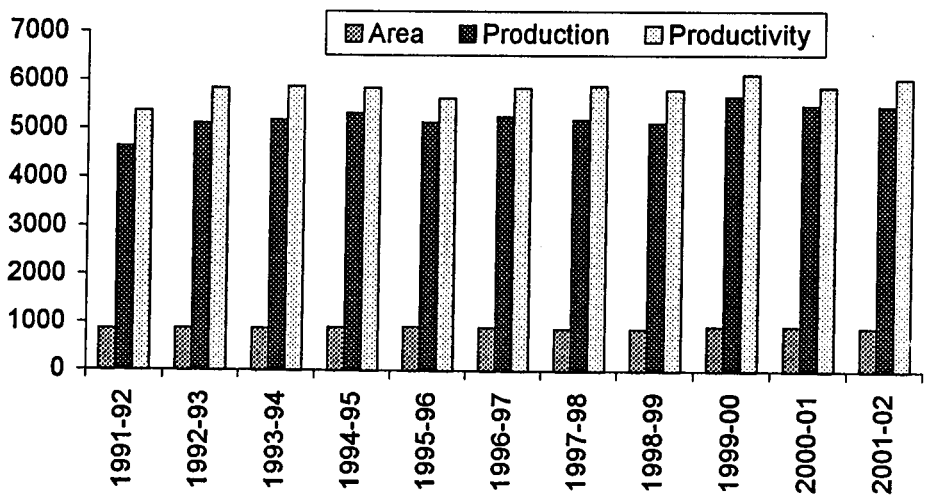
Year	Area ('000 ha)	Production (million nuts)	Productivity (mets/ha)
1991-92	863	4641	5377
92-93	877	5124	5843
93-94	882	5192	5885
94-95	911	5336	5858
95-96	914	5155	5638
96-97	902	5276	5849
97-98	884	5210	5891
98-99	882	5132	5817
99-00	925	5680	6140
00-01	936	5496	5870
01-02	906	5479	6047

Source: Economic Review, Govt. of Kerala, Trivandrum, 2003.

It is evident from table 2.5 that Area under coconut in Kerala showed an increasing trend till 1995-96 and then declined till 1998-99 and again showed an increasing trend for the year 1999-00 and 2000-01. Production also showed an increasing trend till 1994-95, but in 1995-96, 1997-98, 1998-99 and in 2000-01 it showed decreasing trends. Productivity also showed a more or less similar pattern. The trend in area, production and productivity of coconut in Kerala is also depicted in Figure 2.3.

Figure 2.3

Area production and Productivity of Coconut in Kerala



Source: Economic Review, Government of Kerala, Trivandrum, 2003.

If we examine the performance of the yester years, Kerala's share in the all-India production, which was hovering around 70 per cent through the fifties, has declined from the mid-sixties and decrease has been sharp during the seventies and eighties. The share of Kerala, which was around 68 per cent

till 1974, steadily declined since then reaching below 50 per cent by 1998-99. This is to some extent due to the decline in the share of Kerala in the total area. In other words, area increase in Kerala, which was comparable to the All-India rate till 1974 slipped below that level since then. But the main reason for the decline in the share of Kerala in the All-India production has been the decline in the productivity of coconut palm. The productivity of coconut which was 6511 nuts per hectare during the early fifties showed a mild increase through the fifties reaching 6842 nuts by the late fifties. Since then the productivity has shown a steady decline reaching a level of 4510 nuts by the triennium ending 1987-88. Thus, the main reason for the decline in the share of Kerala in the all India production of coconut was the declining per hectare productivity of the crop in the state.[8]

District-wise analysis showed that Kozhikode has the largest area under coconut i.e., 130100 hectare. Malappuram district is in the second position with an area of 104171 hectares, followed by Kannur with 95712 hectares. The district-wise area and their ranks in order has been given in Table 2.6.

[8] D. Narayana & Others, *Coconut Development in Kerala*, Centre for Development Studies, Trivandrum (1991), pp.8-9.

TABLE 2.6

District-wise area under coconut in Kerala

Name of District	Area in hectares	% share	Rank
Thiruvananthapuram	88604	9.80	4
Kollam	74956	8.30	6
Pathanamthitta	22696	2.51	13
Alappuzha	57047	6.31	9
Kottayam	37429	4.14	11
Idukki	25603	2.83	12
Ernakulam	62684	6.93	7
Trissur	85480	9.46	5
Palakkad	50568	5.60	10
Malappuram	104171	11.52	2
Kozhikode	130100	14.40	1
Wynad	11383	1.26	14
Kannur	95712	10.60	3
Kasargod	57285	6.34	8
Total	903718	100.00	

Source: Farm guide: 2004.

It is clear from table 2.6 that since Kozhikode district has 14.40 per cent of total area under coconut in the state it has been ranked first in the group. The next rank goes to Malappuram district, which is having 11.52 per cent of the area under coconut in the state. Kannur, Thiruvananthapuram and Trissur holds the next consecutive ranks having the share of area of 10.60 per

cent, 9.80 per cent and 9.46 per cent respectively. Wynad district has the lowest area under coconut in the state, the share of area being 1.26 per cent.

In the matter of production and productivity also there is variations among the fourteen districts of Kerala as shown in Table 2.7.

TABLE 2.7

District-wise production and productivity of coconut in Kerala

Name of District	Production (nuts Lakh)	Productivity Nuts per hectare
Thiruvananthapuram	6269	7076
Kollam	4247	5670
Pathanamthitta	1240	5464
Alappuzha	2797	4908
Kottayam	1798	4565
Idukki	960	3750
Ernakulam	3431	5472
Thrissur	5451	6376
Palakkad	2841	5616
Malappuram	5991	5750
Kozhikode	8943	6879
Wynad	390	3426
Kannur	6039	6311
Kasargod	4381	7646

Source: Compiled from farm Guide: 2004.

It can be observed from Table 2.7 that as in the case of area, in production too Kozhikode district is ahead of other districts with a production

of 8943 lakh nuts per annum. Thiruvananthapuram district which is having the fourth rank in area (Table 2.6), is in the second position with 6269 lakh nuts per annum.

In productivity Kasargod district, whose production is 4381 lakh nuts per annum, tops the tally with 7646 nuts per hectare. At the same time, in area, Kasargod district has the eighth rank. Kozhikode district which is having the first rank in area and production, has only 6879 nuts from an hectare. Wynad district with just 390 lakh nuts is the lowest in production and also in the matter of productivity with 3426 nuts per hectare.

When the trend in area, production and productivity of the three sample districts of the present study is separately taken into consideration, it can be observed that there had been notable variation in area, production and productivity in these districts.

TABLE 2.8

Trend in area under coconut in the sample districts for 5 years from 1997-98 to 01-02 (hectares)

Years	Kozhikode		Ernakulam		Thiruvananthapuram	
	Area (hectares)	%	Area (hectares)	%	Area (hectares)	%
1997-98	122379	-	64816	-	84308	-
1998-99	129506	+5.82	61719	-4.78	91271	+8.26
1999-00	131061	+1.20	68110	+10.35	91362	+0.09
2000-01	128739	-1.77	67402	-1.04	88663	-2.95
2001-02	130100	+1.05	62684	-6.99	88604	-0.06

Source: Compiled from Farm Guide – Various issues.

It can be observed from Table 2.8 that area under coconut in Kozhikode district, which belongs to the Northern region of the present study, showed a steady increase in the two years following the year 1997-98. The per centage increase in 1998-99 as compared to 1997-98 was 5.82 per cent but it was only 1.20 per cent in 1999-2000. Then it showed a decrease of 1.77 per cent in 2000-01 and again there was a slight increase during 2001-02 to the extent of 1.05 per cent.

Area under coconut in Ernakulam district, which belong to the central region of the present study, showed a decrease in 1998-99 to the extent of 4.78 per cent as compared to 1997-98. But in 1999-00 the increase was 10.35 per cent and then showed a decreasing trend in the two years that followed ie during 2000-01 and 2001-02, to the extent of 1.04 per cent and 6.99 per cent respectively.

Area under coconut in Thiruvananthapuram district, which belong to the southern region of the present study, showed an increasing trend in the first two years following 1997-98, to the extend of 8.26 per cent in 1998-99 and only 0.09 per cent in 1999-00. Then it showed a decreasing trend during the two years that followed ie 2.95 per cent in 2000-01 and 0.06 per cent in2001-02.

The trend in production of coconut also shows differences among the three sample districts of the three regions. The trend in production for five years period from 1997-98 to 2001-02 has been shown in Table 2.9.

TABLE 2.9

Trend in production of coconut in the sample districts for 5 years (in lakh nuts)

Years	Kozhikode		Ernakulam		Thiruvananthapuram	
	Production (Lakh nuts)	%	Production (Lakh nuts)	%	Production (Lakh nuts)	%
1997-98	9290	-	3566	-	5158	-
1998-99	9990	+7.53	3450	-3.25	5550	+7.59
1999-00	10590	+6.00	4060	+17.68	6080	+9.55
2000-01	9030	-14.73	3580	-11.82	6350	+4.44
2001-02	8950	-0.88	3430	-4.19	6270	-1.25

Source: Compiled from Farm Guide – Various issues.

As can be noted from Table 2.9 there has been so many ups and downs in production of coconut in all the three districts over the years. In Kozhikode district, compared to the year 1997-98, production showed increasing trend ie. 7.55 per cent and 6 per cent in the two successive years and then showed declining trend in the last two years, the decline in the year 2000-01 being very sharp ie. 14.73 per cent. But the decline in 2001-02 was only 0.88 per cent.

In Ernakulam district, increase in production was reported only in the year 1999-'00 as against the decreasing trends in other years ie. 3.25 per cent

in 1998-99, 11.82 per cent in 2000-01 and 4.19 per cent in 2001-02. The increase recorded in 1999-00 was very high ie. 17.68 per cent.

In Thiruvananthapuram district, production showed increasing trend every year except for the last year under consideration. The percentages of increase were 7.59 per cent in 1998-99, 9.55 per cent in 1999-00 and 4.44 per cent in 2000-01. The only decrease recorded was in the year 2001-02 ie. 1.25 per cent.

The trend in productivity also showed differences among the three districts as shown in Table 2.10.

TABLE 2.10

Trend in Productivity of coconut in the sample districts for 5 years

(Nuts per hectare)

Years	Kozhikode		Ernakulam		Thiruvananthapuram	
	Productivity (Nuts per hectare)	%	Productivity (Nuts per hectare)	%	Productivity (Nuts per hectare)	%
1997-98	7591	-	5502	-	6118	-
1998-99	7714	+1.62	5590	+1.59	6081	-0.60
1999-00	8080	+4.74	5961	+6.64	6655	+9.43
2000-01	7014	-13.19	5311	-10.90	7162	+7.62
2001-02	6879	-1.92	5472	+3.03	7076	-1.20

Source: Compiled from Farm Guide – Various Issues.

The productivity trend also showed variations among districts (Table 2.10). In Kozhikode district productivity improvement was 1.62 in 1998-99

as compared to 1997-98. In 1999-00 again there was an improvement of 4.74 per cent. But there was a sharp decline of 13.19 per cent in the following year and the decline in the last year ie. 2001-02 was 1.92 per cent.

In Ernakulam district, compared to 1997-98, there was productivity improvement to the extent of 1.59 per cent and 6.64 per cent respectively for the years 1998-99 and 1999-00. But in 2000-01, there was a sharp decline in productivity to the extent of 10.90 per cent. In the year 2001-02 it again improved to 3.03 per cent.

In Thiruvananthapuram district, unlike Kozhikode and Ernakulam districts, productivity recorded a slight decrease in the year 1998-99 by 0.60 per cent as compared to 1997-98 and then improved in the next two years ie. 1999-00 and 2000-01 by 9.43 per cent and 7.62 per cent respectively and again declined in 2001-02 by 1.20 per cent.

The discussion in the previous pages revealed that the production pattern of coconut is not uniform in the country and even in the state, wide variations could be noticed in crop area, production and productivity which also affects the fortunes of the cultivators. Like production and productivity, consumption of coconut too has a significant impact on the socio-economic scenario of the cultivators, which is discussed in the next chapter.

CHAPTER 3

CONSUMPTION PATTERN OF COCONUT

Coconut, perhaps, yields more products of usefulness to mankind than any other tree. Each and every part of the coconut palm is used in India in one way or other and the classics of India have rightly eulogized it as 'Kalpavriksha' (the all giving tree) owing to the multifarious uses of various palm parts and products in our daily life. It is a versatile palm variously known as 'tree of life', 'tree of heaven', 'tree of abundance', 'nature's super market', 'king of palms', 'God's gift to mankind' etc. [1]

Though coconut is best known as a food and oil seed crop, of late, it has also assumed significance as a beverage and fiber crop in our country.

Mature coconuts are used for making milling and edible copra and for the manufacture of desiccated coconut and other kernel based food products. Mature coconut is also used for social, religious and cultural functions and rituals throughout the country. While the coconut is a food crop at the national level, it is more an oil seed in Kerala. In West Bengal it is a beverage crop since more than 80 per cent of coconut is consumed as tender nuts.

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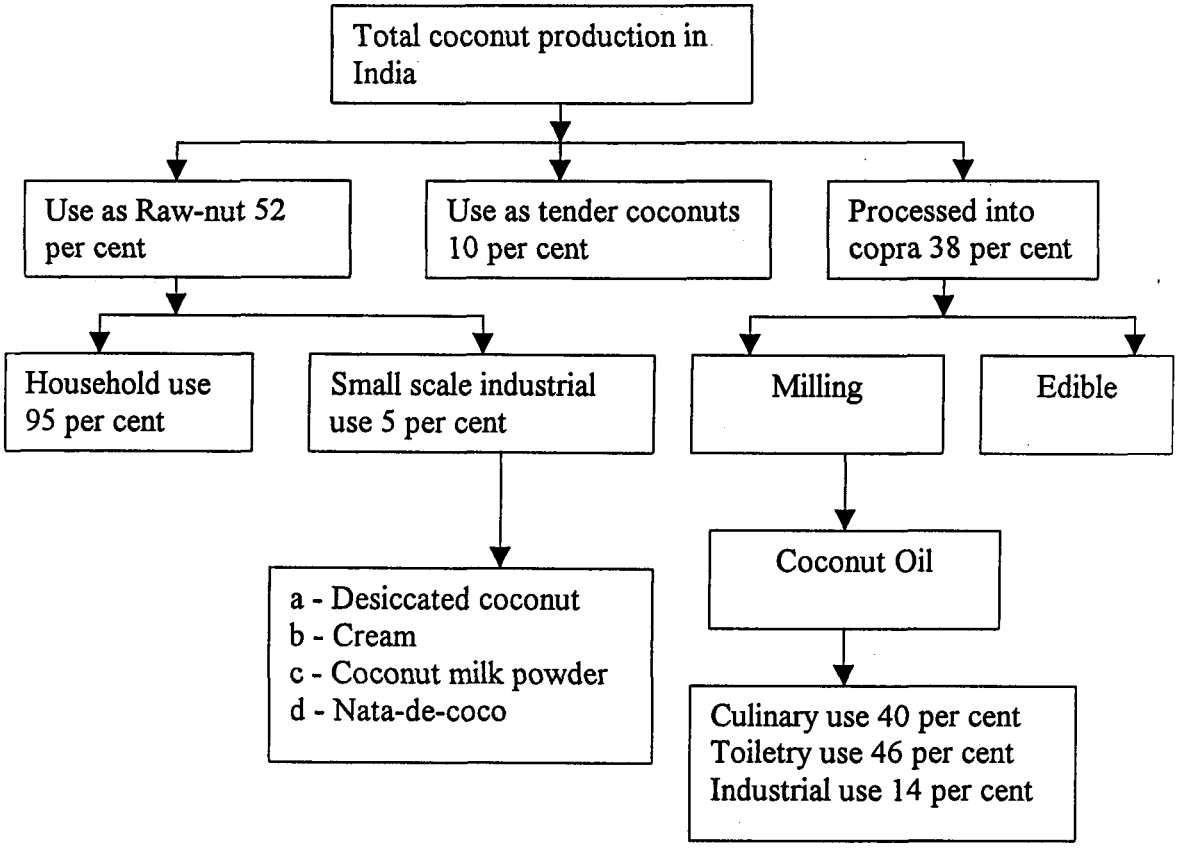
[1] P. Rethinem and L. Thoufikurahman', 'Global Scenario of Coconut Oil' - Indian Coconut Journal, Nov: 2002, p.1.

In the commercial sector coconuts are mainly used for making ball copra and desiccated coconut in Karnataka, while in Tamil Nadu it is used for making milling copra and coconut oil. In almost all the states coconut is used in the raw-form or in the dry form in the households for various culinary preparations. The consumption pattern of total coconuts produced in the country is shown in figure 3.1.

Fig. 3.1: Structure of consumption of coconuts in India



Source: Prepared on the basis of feature published in 'Madhyamam daily' 2003.

Of the total coconut production in the country, 52 per cent is consumed in raw-form. About 95 per cent of this is used for household uses and about 5 per cent is used for small-scale industrial use like manufacturing of desiccated coconut, coconut cream, coconut milk powder, Nata-de-coco etc.

About 10 per cent of the total coconut production in the country is consumed as tender coconut, it being a natural soft drink for quenching thirst.

The remaining 38 per cent is processed into copra, a major portion being milling copra. A small portion is also converted into edible copra. It is from the milling copra that coconut oil is extracted. Of this coconut oil, about 40 per cent is used for edible or culinary uses, 46 per cent for toiletry use and the remaining 14 per cent for industrial uses (Fig: 3.1).

A peculiar feature of coconut industry is that the price of coconut is determined by the price of coconut oil. An accepted norm for conversion still followed in Kerala (erstwhile Malabar, Travancore, Cochin) is that the price of one quintal of coconut oil is equivalent to the price of thousand nuts. In other words, the cost of one nut is equivalent to hundred grams of coconut oil.[2]

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[2] P.T. Thomas, 'Marketing of Coconut Products' - Indian Coconut Journal, Aug: 1998, p.122.

Consumption of Conventional Coconut Products

Coconut Oil

In Kerala production of coconut oil seems to be the basic intention behind coconut cultivation. Coconut oil is preferred as a cooking medium by the Keralites and they are prepared to pay premium price for it. The farm gate price of coconut is determined by the wholesale price of coconut oil. The price of one quintal of coconut oil is more or less equivalent to the price of 1000 coconuts all along the west coast.[3]

The composition of the edible oil basket in Kerala is quite distinct from that elsewhere in the country and is dominated by coconut oil (Table 3.1)

The demand for coconut oil is essentially from the households with only limited demand from organised industry. The demand for edible use is confined to Kerala and to centres with a sizable Malayalee population.

Since people in Kerala use different combination of oils, on examination of the main item of edible oil consumed by them, the study revealed that, on an average 70.83 per cent of respondents are using coconut oil as the main item of edible oil. Next to coconut oil, palm oil is consumed (28.67 per cent) as the main item of edible oil. Sunflower oil is consumed as

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[3] V.T. Markose and P.T. Thomas, *'Impact of Minimum Support Price for Copra on Market Prices of Coconut Products'*- Indian Coconut Journal, June: 2000, pp.11-14.

the main item of edible oil only by a negligible (0.5 per cent) per cent of respondents (Table 3.1).

TABLE 3.1

Main item of edible oil consumed by respondents

Region / Items of oil	North	Central	South	Average
	%	%	%	%
Coconut oil	74.50	74.50	63.50	70.83
Palm oil	25.50	25.50	35.00	28.67
Sunflower oil	0.00	0.00	1.50	0.50
Total	100	100	100	100

Source: Survey data.

Region wise, an equal percentage of respondents from North and Central regions (74.5 per cent each) and 63.5 per cent from the South use coconut oil as main item of edible oil. An equal percentage of respondents (25.5 per cent each) from North as well as from the Central regions use palm oil as the main item of edible oil. While it is 35 per cent in the South.

Consumer Preference of Packed Edible Oil:

A number of brands of various edible oils are available at present in the market. The brand and type of edible oil vary depending upon taste, purchasing power and preference of consumers.

The study revealed that, on an average, 46.83 per cent of respondents prefer buying edible oil in packs while 34.5 per cent prefer buying in loose

measure. 18.67 per cent of respondents have no such preferences. That means, they buy both packed as well as loose measures. This is depicted in Table 3.2.

TABLE 3.2

Consumer preference of packed edible oil

Region / Preference	North	Central	South	Average
	%	%	%	%
Buying in packs	41.50	50.00	49.00	46.83
Buying loose measure	26.50	32.50	44.50	34.50
No such preference	32.00	17.50	6.50	18.67
Total	100	100	100	100

Source: Survey data.

Region wise, 50 per cent (the highest) in the central region and 41.5 per cent (the lowest) of respondents in the North prefer buying edible oil in packs.

On the other hand, 44.5 per cent (the highest) in the South, and 26.5 per cent (the lowest) of respondents in the North prefer buying in loose measure.

The study also brought out the fact that urban consumers are more interested (58.33 per cent) in buying edible oil in packs than rural consumers (35.33 per cent). At the same time, 24.67 per cent of rural and 12.67 per cent of urban consumers reported 'No such preferences.'

Regarding the reason for preferring buying in packs, the study revealed that 'easy handling and transporting' (average 30.96 per cent) and 'purity' (average 28.11 per cent) are the two important reasons for buying edible oil in packs. The answer 'loose measure not available in my area' has been stated on average by only 2.85 per cent (the lowest) of respondents. This is depicted in the following table :

TABLE 3.3

Reasons for preferring buying in packs

Region / Reason	% of respondent			
	North	Central	South	Average
Easy handling and transporting	38.55	28.00	27.55	30.96
Easy storage	19.28	18.00	13.27	16.73
Accurate label mentioned quantity	8.43	17.00	20.41	15.66
Purity	28.92	24.00	31.63	28.11
Reusability of empty container	2.41	10.00	4.08	5.69
Loose measure not available in my area	2.41	3.00	3.06	2.85
Total	100	100	100	100

Source: Survey data.

Regarding the reasons for preferring loose measure, it is evident from Table 3.4 that 'cost factor' is the most important reason (average 57.49 per cent) for buying edible oil in loose measure. That means, they think that

buying in loose measure is less costly than buying in packs. On an average only 4.83 per cent of respondents (the lowest) answered 'packed oil not available in my area' as the reason for buying loose measure. That means, non-availability of packed oil is not a major problem in the state. They are available every where under different brand names.

TABLE 3.4

Reasons for preferring buying in loose measure

Region / Reason	% of respondents			
	North	Central	South	Average
Cost factor (less price)	26.42	72.31	65.17	57.49
Taste factor	16.98	12.31	12.36	13.53
Quality factor	7.55	9.23	7.87	8.21
Quantity factor (Correct quantity)	49.06	3.08	5.62	15.94
Packed oil not available in my area	0.00	3.08	8.99	4.83
Total	100	100	100	100

Source: Survey data.

Region wise, the percentage of those who answered 'cost factor' as the main reason for buying edible oil in loose measure are: 26.42 (the lowest) in the North and 72.31 (the highest) in the central region.

The answer 'quantity factor' (correct quantity) as the main reason has been pointed out by 49.06 per cent (the highest) of respondents from the

North. This means the respondents from the North are very much doubtful about the correct quantity in packed oil. They think that buying in loose measure only will offer them exact quantity.

Propaganda against coconut oil

The demand for coconut oil for cooking purposes, mainly confined to Kerala households, started declining with the availability of palm oil at low price and with the entry of so called 'heart-friendly' refined vegetable oils in attractive packs at reasonable rates in local markets. The coconut oil consumption for cooking purpose even dropped to 25000 tonnes in the end of 80s and the beginning of `90s because of the malicious propaganda unleashed by the refined vegetable oil manufacturers that consumption of coconut oil will cause increase cholesterol level in the body.[4] Though there were no scientific data to relate consumption of coconut oil on increased cholesterol level, the propaganda had serious impact on the consumers.

The reaction of the respondents towards the propaganda has been shown in the table 3.5.

It is clear from the table that, on an average, 68.33 per cent of respondents believed it, while 31.64 per cent did not believe.

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[4] T.B. Nandakumar, *"Recent development in Coconut Industry in India with Special Reference to Kerala"*- Indian Coconut Journal, March, 98, pp.6-8.

TABLE 3.5

Reaction of consumers to propaganda against coconut oil

Region / Reactions	North	Central	South	Average
	%	%	%	%
Believed	63.50	63.50	78.00	68.33
Not believed	36.50	36.50	22.00	31.64
Total	100	100	100	100

Source: Survey data.

Region wise, 63.5 per cent each in the North and Central regions, and 78 per cent (the highest) in the South believed this propaganda.

Thus, it can be inferred that, people in Kerala, irrespective of region, believed the propaganda against coconut oil that it contained harmful cholesterol.

Locality wise, 74 per cent of respondents from urban area and 62.67 per cent from rural are believed the propaganda.

The high percentage in the urban area could be due to the impact of various media publicity promoting other refined edible oils.

Regarding the reduction in consumption of coconut oil due to the propaganda, Table 3.6 makes it clear that believing the propaganda, on an average, 41.91 per cent of respondents reduced their consumption of coconut oil up to 50 per cent. Only 9.27 per cent of respondent reduced their consumption up to 100 per cent (completely).

Region wise, none of the respondents from the central region did completely reduce consumption. But 10.92 per cent of respondents from the North and 16.85 per cent of respondents from South reduced their consumption completely (i.e., up to 100 per cent).

TABLE 3.6

Reduction in consumption of coconut oil due to cholesterol propaganda

(in per cent)

Region / Quantity reduced %	North	Central	South	Average
	%	%	%	%
Upto 25	25.45	32.14	22.47	26.69
26-50	25.45	55.36	44.94	41.91
51-75	38.18	12.50	15.73	22.13
76-100	10.92	0.00	16.85	9.27
Total	100	100	100	100

Source: Survey data.

It can be noted that, in the Central region, though 55.36 per cent (the highest) of respondents reduced consumption up to 50 per cent, beyond that their reduction percentage decreased considerably and unlike other regions, none of the respondents reduced consumption up to 100 per cent (i.e., completely).

This could be due to the publicity programmes undertaken by the C.D.B. in that region in inculcating the health benefits of coconut oil, which

would have acted, indirectly, as a counter-propaganda to the false propaganda against coconut oil.

Regarding the period of abstention from using coconut oil, the study revealed that (table 3.7) due to the propaganda, 58.32 per cent of respondents abstained up to 5 years. Region wise, it is 73.21 per cent (the highest) in the Central region and 47.19 per cent (the lowest) in the South.

TABLE 3.7

Period of abstention from coconut oil by consumers

Region / Period (year)	North	Central	South	Average
	%	%	%	%
Below 1 year	45.45	26.79	39.33	37.19
1-5 year	54.55	73.21	47.19	58.32
6-10 year	0.00	0.00	13.48	4.49
Above 10 year	0.00	0.00	0.00	0.00
Total	100	100	100	100

Source: Survey data.

None of the respondents from all the three regions abstained for above 10 years.

The study revealed that on an average 53.28 per cent of respondents consider palm oil as the immediate substitute for coconut oil because, they shifted to it when they knew that coconut oil contains cholesterol (Table 3.8).

TABLE 3.8

Immediate substitute for coconut oil

(Region wise)

Region / Name of oil	North	Central	South	Average
	%	%	%	%
Palm oil	60.00	57.14	42.70	53.28
Sunflower oil	25.45	32.14	32.58	30.05
Ground nut oil	14.55	5.36	6.74	4.04
Mustard oil	0.00	5.36	6.74	4.04
Total	100	100	100	100

Source: Survey data.

Region wise, 60 per cent (the highest) from the North, and 42.7 per cent from the South reported palm oil to be the immediate substitute for coconut oil.

Next to palm oil, sunflower oil is other edible oil to which respondents shifted their consumption. Other edible oils like Mustard oil is consumed as the substitute for coconut oil, by a negligible per cent (on an average 4.04) of respondents, confined to the South.

Thus, it can be concluded on the basis of the above that palm oil is the immediate substitute edible oil for coconut oil, irrespective of regions.

Income class wise, (Table 3.9) the study revealed that, the percentages of respondent using palm oil as an immediate substitute decreases as their level of income increases i.e., when 96.88 per cent of respondents belonging

to income class 'up to 2000' use palm oil as immediate substitute for coconut oil, it is only 10.42 per cent at the income level above 10,000.

TABLE 3.9

Immediate substitute for coconut oil

(Income Class wise)

Income class / Name of oil	Up to 2000	2001-5000	5001-10,000	Above 10,000
	%	%	%	%
Palm oil	96.88	79.69	26.57	10.42
Sunflower oil	0.00	9.38	39.29	68.75
Ground nut oil	3.12	10.93	25.00	10.42
Mustard oil	0.00	0.00	7.14	10.41
Total	100	100	100	100

Source: Survey data.

On the contrary, the percentage of respondents using sunflower oil as immediate substitute for coconut oil for cooking purpose is highest (68.75 per cent) at the income level 'above 10,000'.

Thus, it can be inferred that palm oil as an immediate substitute for coconut oil for cooking purpose is significant only at lower income levels but at higher income levels other refined oils like sunflower oil are significant.

The study also brought out that (table 3.10), on an average 49.03 per cent of respondents shifted back fully to coconut oil after their abstention on

the basis of the cholesterol propaganda. 50.6 per cent of respondents shifted partly while only a negligible 0.37 per cent 'never shifted'.

TABLE 3.10

Shifting back to coconut oil by consumers

Region / Opinion	North	Central	South	Average
	%	%	%	%
Fully shifted	58.18	42.86	46.07	49.03
Partly shifted	41.82	57.14	52.81	50.60
Never shifted	0.00	0.00	1.12	0.37
Total	100	100	100	100

Source: Survey data.

The percentage of those shifted back to coconut oil fully is the highest (58.18 per cent) in the North as compared to Central and South (42.86 per cent and 46.07 per cent) respectively.

Since the average of those shifted partly is more than those shifted fully, it can inferred that about 50 per cent of people in Kerala are still using other edible oils along with coconut oil. It also indicates that their abstention from using coconut oil for edible purpose continues since the impact of the propaganda still lingers in their minds.

USE OF COCONUT OIL FOR TOILETRY PURPOSE

Coconut oil has low 'viscosity',[5] pleasant aroma and easy washability. It is the most suitable oil to keep the pores of the skin open and is applied to the entire body even by adults and slowly massaged into the skin which even after bath keeps the skin soft throughout the day.

As per table 3.11, majority of respondents (52 per cent) use coconut oil for toiletry purpose, 'occasionally'. Only 26.33 per cent use it 'always'. 21.67 per cent of respondents 'never use' coconut oil for toiletry purpose.

TABLE 3.11

Use of coconut oil for toiletry purpose

(Region-wise)

Region / Opinion	North	Central	South	Average
	%	%	%	%
Always use	14.50	36.00	28.50	26.33
Occasionally use	49.00	47.50	59.50	52.00
Never use	36.50	16.50	12.00	21.67
Total	100	100	100	100

Source: Survey data.

Region wise, 36 per cent from the Central (the highest), and 14.5 per cent from the North (the lowest) always use coconut oil for toiletry use.

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[5] Viscosity: The resistance of a fluid to shear forces and hence to flow. Such shear resistance is proportional to the relative velocity between the two surfaces on either

59.5 per cent of respondents from the South (the highest), and 47.5 per cent (the lowest) from the Central region reported 'occasionally use'.

Thus, it is clear from the above that, most people in Kerala use coconut oil for toiletry purpose only occasionally.

A gender wise examination revealed that (table 3.12), female respondents are using coconut oil for toiletry purpose more than male respondents. The percentage of those who 'always use' among female respondents is 36.73, while it is only 19.15 per cent among male respondents. In the case of those who use 'occasionally' also, female respondents are in the forefront, their percentage being 56.73.

TABLE 3.12

Use of coconut oil for toiletry purpose

(Gender wise)

Gender / Opinion	Male	Female
	%	%
Always use	19.15	36.73
Occasionally use	48.73	56.73
Never use	32.12	6.54
Total	100	100

Source: Survey Data.

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side of a layer of fluid, the area in shear, the coefficient of viscosity of the fluid and the reciprocal of the thickness of layer of fluid.

It is, therefore, clear that the women have more preference for coconut oil for toiletry use, than their male counterparts.

Regarding the reason for using coconut oil for toiletry purpose, the study made if clear that (table 3.13) 'traditional belief' and 'own experience' of the consumer are the two important reasons for using coconut oil for toiletry purpose. On an average 44.68 per cent of respondents answered 'traditional belief' as the reason, while 41.06 per cent answered 'own experience' as the reason.

TABLE 3.13

Reason for using coconut oil for toiletry purpose

(Region-wise)

Region / Reason	North	Central	South	Average
	%	%	%	%
Traditional belief	57.48	57.49	23.30	44.68
Own experience	35.43	34.13	51.70	41.06
Good fragrance	6.30	8.38	18.75	11.71
Doctor's advice	0.79	0.00	6.25	2.55
Total	100	100	100	100

Source: Survey Data.

On an average 11.71 per cent of respondents answered 'good fragrance' as the reason while only 2.55 per cent answered 'doctors advice'.

Thus, it is clear from the above that 'traditional belief' and 'own experience' are the two important reasons for using coconut oil for toiletry purpose.

Locality wise (table 3.14), when the percentage of rural respondents who opine 'traditional belief' to be the reason is 55.52, it is 32.89 per cent among urban respondents.

TABLE 3.14

Reason for using coconut oil for toiletry purpose

(Locality wise)

Locality / Reason	Rural	Urban
	%	%
Traditional belief	55.52	32.89
Own experience	36.73	45.78
Good fragrance	5.71	18.22
Doctor's advise	2.04	3.11
Total	100	100

Source: Survey Data.

Conversely, when 45.78 per cent of respondents from urban area opine 'own experience' to be the reason, it is 36.73 per cent among rural respondents. Only lower percentage of respondents stated other reasons.

Thus, it can be inferred that, when 'traditional belief' is the reason for using coconut oil for toiletry purpose among rural consumers, it is 'own experience' among urban consumers.

TENDER COCONUT

The liquid endosperm of the tender coconut (seven to eight moths old) makes a refreshing drink, particularly during summer. The use of tender coconut water is recommended in cases of gastro enteritis and as a useful substitute for saline glucose in intravenous infusions. It is also prescribed in serious cases of diarrhea and vomiting against dehydration of the body tissues. It increases the blood circulation in the kidneys and it is a diuretic.[6]

The region wise preference of consumers in using thirst-quenching beverages has been shown in Table 3.15.

The study made it clear that on an average 51.16 per cent of respondents use neither tender coconut nor artificial beverages to quench their thirst. They answered 'none of the above'. But among others, the percentage of those who prefer 'tender coconut' is the highest (36.67 per cent), while it is only 12.17 per cent in the case of 'artificial beverages'.

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[6] P.K. Thompson, 'Handbook of Coconut palm', CDB. Kochi, 1993, pp.263-265.

TABLE 3.15

Preference of consumers in using thirst-quenching beverages

Region / Items of drink	North	Central	South	Average
	%	%	%	%
Artificial beverages	14.00	9.50	13.00	12.17
Tender coconut water	30.50	39.50	40.00	36.67
None of the above	55.50	51.00	47.00	51.16
Total	100	100	100	100

Source: Survey Data.

A locality wise study revealed that, when 52.34 per cent of respondents from rural area preferred neither artificial beverages nor tender coconut, it is 50 per cent among the urban respondents. But of those who use either, the percentage of those who prefer tender coconut is the highest (40.33 per cent) among rural respondents, while it is 33 per cent among urban respondents.

Conversely, while 17 per cent (the highest) of urban respondents prefer artificial beverages to quench their thirst, it is only 7.33 per cent among rural respondents.

Thus, it can be inferred from the above that, both urban as well as rural consumers have more preference of tender coconut water, though the percentage is higher in rural area when compared to urban area.

CONSUMER AWARENESS ABOUT DIVERSIFIED COCONUT PRODUCTS

In order to test the awareness of consumers about diversified products from coconut, respondents were asked about Kernel based products, shell based products and husk based products. Three types of answers were suggested such as 'know' 'very well know' and 'do not know'. On the basis of the information furnished by them, first of all their percentage were analysed and the variations interpreted.

KERNEL BASED PRODUCTS

Among the kernel based products were included desiccated coconut, coconut cream, coconut lessy, coconut snowball, ready-to-use chutney and coconut milk powder.

Since almost all of the respondents answered 'do not know' for all of the products, except for desiccated coconut, the analysis of the same has been attempted in the following pages:

Desiccated coconut

Desiccated coconut is the dried out disintegrated coconut meat. In India it is commercially known as 'coconut powder'. It is a very important coconut based product having very good demand all over the world in the

confectionary and allied food industries. Desiccated coconut is crisp, snow white in colour and has a sweet, pleasant and fresh taste of the nut.[7]

The awareness of the respondents about this Kernel based product has been shown in table 3.16.

The study made it clear that on an average 45.33 per cent of respondents 'know' about this product while 50.33 per cent 'do not know'. The percentage of those who 'very well know' is only 4.33 per cent (Table 3.16).

TABLE 3.16

Awareness about desiccated coconut

Region / Opinion	North	Central	South	Average
	%	%	%	%
Know	17.50	72.50	46.00	45.33
Very well know	0.50	3.50	9.00	4.33
Do not know	82.00	24.00	45.00	50.33
Total	100	100	100	100

Source: Survey Data.

Region wise, those from central region are having more awareness about desiccated coconut, their percentage being 72.5 per cent. It is 35 per cent (the lowest) in the North.

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[7] Coconut Development Board, Kochi, Kerala, "Processing and marketing of Desiccated Coconut", 1996, pp.5-10.

The percentage of those 'very well know' is 9 per cent (the highest) in the South and only 0.5 per cent (the lowest) in the North.

Thus, it is clear that, majority of respondents 'do not know' about desiccated coconut. Respondents belonging to the Central region have more awareness about this product. This could be due to the impact of the publicity programmes undertaken by the CDB about this product.

COCONUT WATER BASED PRODUCTS

Among the coconut water based products, preserved tender coconut water, coconut water vinegar, coco sauce, coco honey, nata-de-coco , biogas from coconut water, electricity from coconut water etc were included.

Since almost all of the respondents answered 'do not know' for all the products, except for 'preserved tender coconut water', the analysis of the same has been attempted in the following pages.

Preserved Tender Coconut Water

Tender coconut water is a delicious and refreshing drink, consumed as a beverage in all the metropolitan cities and smaller towns in the country. Today, with the efforts of the CDB, a technology for the preservation and packing of tender coconut water in cans/pouches was developed in collaboration with Defence Food Laboratory, Mysore and has already been

commercialised. The product is receiving good response in the market as demand is increasing.[8]

The study revealed that, on an average, 43.83 per cent of respondents 'know' about preserved tender coconut water while 52.17 per cent 'do not know' about it (table 3.17). The percentage of those 'very well know' is on an average only 4 per cent.

TABLE 3.17

Awareness about preserved tender coconut water

Region / Opinion	North	Central	South	Average
	%	%	%	%
Know	44.50	63.00	24.00	43.83
Very well know	0.50	10.50	1.00	4.00
Do not know	55.00	26.50	75.00	52.17
Total	100	100	100	100

Source: Survey Data.

Region wise, in the Central region there is more awareness about this product as 63 per cent (the highest) of respondents 'know' about it while only 24 per cent (the lowest) in the South 'Know' about preserved tender coconut water (table 3.17).

The percentage of those who 'do not know' is 75 per cent (the highest) in the South and 26.5 per cent (the lowest) in the Central region.

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[8] "*Augmentation of Coconut Marketing*", *Issue*: "*Indian coconut journal*", October, 2003, p.3-6.

The percentage of those 'very well know' is also the highest (10.5 per cent) in the central region.

The higher awareness in the Central region could be due to publicity programmes undertaken by the CDB in propagating this product as a thirst-quenching beverage.

COCONUT SHELL BASED PRODUCTS

Among the shell based products, activated carbon, shell powder, shell oil etc were included.

Since almost all of the respondents answered 'do not know' about shell powder and shell oil, the analysis of activated carbon only has been attempted in the following pages:

ACTIVATED CARBON

Activated carbon is manufactured by the treatment of crushed coconut shells with surface active chemicals followed by drying and subjecting the material to carbonisation. It is then activated with steam at about 900°C followed by air to facilitate oxidation. Then it is subjected to steam quenching, acid treatment, then washing with water, dried and stored. Activated carbon is extensively used as agents for purifying volatile oils and chemical solutions.

The study revealed that on an average, 41.67 per cent of respondents 'know' about Activated Carbon while 49.33 per cent 'do not know'. The percentage of those 'very well know' is only 9 per cent (table 3.18).

TABLE 3.18

Awareness about Activated Carbon

Region / Opinion	North	Central	South	Average
	%	%	%	%
Know	33.50	56.50	35.00	41.67
Very well know	1.00	25.50	0.50	9.00
Do not know	65.50	18.00	64.50	49.33
Total	100	100	100	100

Source: Survey Data.

Region wise, 56.5 per cent (the highest) of respondents from the Central region and 33.5 per cent (the lowest) from the North 'know' about it.

The percentage of those 'very well know' is also the highest (25.5 per cent) in the Central region while it is only a negligible 0.5 per cent (the lowest) in the South.

The high awareness in the Central region could be due to the publicity programmes undertaken by the C.D.B in this region about the diversified products of coconut.

COCONUT HUSK BASED PRODUCTS

Husk is a by-product of coconut. Coir is a husk-based product which is a conventional product of the coconut industry. But in the present study among the diversified products from husk are included coir pith, coir geo-textiles and Coir Fiber Wood Cement Board (C.W.C.B).

Analysis based on the information furnished by the respondents regarding 'coir pith' only has been attempted in the following pages. Coir geo textiles and Coir fiber Wood Cement Board (C.W.C.B) have been left out because almost all of the respondents answered 'do not know' about these two products developed from coconut husk.

COIR PITH

'Coir pith' or 'coir dust' is a waste material of the air industry. It constitutes as much as 70 per cent of the husk. One of the suggested uses of coir pith is as a manure or soil conditioner. But the actual manurial value of the pith is found to be very low. Coir pith is proved to be an excellent surface mulch in all kinds of soil. It has enormous water holding capacity which can absorb over 8 times its weight of water and parts with it comparatively slowly. It has been found that by incorporation of 2 per cent by weight of coir

pith with sandy soil, the water holding capacity of the latter is increased by 40 per cent.[9]

Regarding the awareness about coir pith, it is evident from table 3.19 that on an average only 20.33 percentage of respondents 'know' about coir pith. While 78.5 per cent 'do not know'. The percentage of those 'very well know' is only 1.17 per cent.

Region wise, those from the central region 'know' more about this product, their percentage being 36 per cent, while it is only 6 per cent in the North (the lowest).

TABLE 3.19

Awareness about coir pith

(Region wise)

Region / Opinion	North	Central	South	Average
	%	%	%	%
Know	6.00	36.00	19.00	20.33
Very well know	0.00	2.50	1.00	1.17
Do not know	94.00	61.50	80.00	78.50
Total	100	100	100	100

Source: Survey Data.

Only very low percentage of respondents from all regions 'very well know' about coir pith.

[9] P.K. Thampan, *"Hand book of Coconut Palm"*, C.D.B. Kochi, 1993, pp.335-336.

The reason for the comparatively high awareness about this product in the Central region could be due to the role played by the C.D.B in that region in undertaking publicity programmes, so also in inculcating awareness about diversified products from coconut and its palm.

Locality wise (table 3.20), while 25 per cent of respondents from rural area 'know' about coir pith, only 15.67 per cent from urban area 'know' about it.

TABLE 3.20

Awareness about coir pith

(Locality wise)

Locality / Opinion	Rural	Urban
	%	%
Know	25.00	15.67
Very well know	2.00	0.33
Do not know	73.00	84.00
Total	100	100

Source: Survey Data.

The percentage of those 'very well know' is also high in rural area (2 per cent as against 0.33 per cent in urban area).

Thus, it is clear from the above that, unlike other diversified products of coconut, respondents from rural area 'know' more about this product. The reason for this could be that coir pith is mainly used by agriculturists in rural

area for mulching around coconut palms. Since coir pith has the capacity to retain water for longer period, it is becoming popular among the rural people, especially among agriculturists. In recent years, coir pith is also extensively used for the manufacturer compost by farmers.

Thus, it is clear from the foregoing pages that the consumption pattern of coconut is still centred around conventional products, particularly coconut oil. It is also clear that the awareness of the people in Kerala about new diversified products from coconut is quite poor. Just as production and consumption are having influence on the socio-economic scenario of the cultivators, trade in the crop is also an integral part of the coconut industry. In the next chapter a discussion on trade in coconut and its products is attempted.

CHAPTER 4

TRADE IN COCONUT

In the last two chapters, the production pattern and consumption pattern of coconut were discussed. The income stability of the coconut cultivators depend, inter alia, on the trade in the crop also. The present chapter discusses trade in coconut.

Major players in the international trade of coconut and its products are Philippines, Indonesia, Sri Lanka, Malaysia and Thailand. India's total export of all coconut products put together shows a miserable position in the export front. The figure comes to just 0.17 per cent (table 4.1).

TABLE 4.1

India's contribution from the coconut sector to export earnings 1998-2002

Year	Total Exports	Coconut Exports	%
1998	1,301,006,400	2,506,678	0.19
1999	1,397,531,422	3,021,723	0.22
2000	1,595,610,00	3,223,907	0.20
2001	2,016,740,00	3,410,844	0.17
2002	1,222,032,941	2,077,456	0.17

Source: Coconut Development Board.

As is clear from table 4.1, the volume of India's coconut export as a percentage to total export which was 0.19 per cent in 1998 increased to 0.22

per cent in 1999 and then exhibited a decline to 0.20 per cent in 2000 and further declined to 0.17 per cent in 2001 and then remained static during 2002.

Even though a wide range of coconut products are internationally traded, the traditional products such as copra, coconut oil, copra meal, desiccated coconut and coir dominate among them[1] (table 4.2).

TABLE 4.2

Export volume of coconut products from India (MT), 2002

Items	Volume (in MT)	% Share
Coconuts	939	1.47
Copra	0	0
Coconut oil	3134	4.91
Copra Meal	12	0.02
Desiccated Coconut	197	0.31
Coir yarn	11698	18.32
Coir Mattings	4536	7.11
Rugs & Carpets	1517	2.38
Coir Rope	357	0.56
Rubberised Coir	544	0.85
Other Coir Products	2362	3.70
Total	63838	100.00

Source: Compiled from Coconut Statistical Year Book-2002. (A.P.C.C Publication).

Of all the coconut products exported from the country, coir products constitute the predominant item comprising 93.29 per cent. Kernel based

[1] H.P. Singh, 'Coconut Industry in India – Challenges and Opportunities', Indian Coconut Journal Golden Jubilee Issue, August 1998, pp.26-30.

products comes to only 6.71 per cent. This is very low as compared to other important coconut growing countries.

There is ample scope for export of coconut products in India as the EXIM Policy announced by the Government has removed many of the restrictions for the export of coconut products, particularly coconut oil. There is a growing demand for Indian coconut oil abroad where Keralites are found in large numbers.[2]

Although coconut is one of the versatile crops with tremendous economic potential, this has not been fully exploited by us for developing the various coconut products other than coconut oil. The only kernel based product, which has shown its presence felt, is the desiccated coconut industry, which is still in its infancy stage and follow the outdated traditional know how with a limited capacity ranging from 1 to 3 tonnes per day per unit.[3]

In Kerala, trade in coconut is confined mostly to conventional items like copra, coconut oil, coir products and to some extent toddy and tender coconuts.

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[2] Indian Coconut Journal, February 2002, p.21.

[3] Sreekumar Poduval & Ajay M. Pillai, "Developments, challenges and future strategies in post harvest coconut processing sector". Indian Coconut Journal, August 1998, pp.114-115.

Copra

Copra is the dried kernel of coconut prepared from fully matured nuts. It is estimated that nearly 36-40 per cent of coconuts are utilized for the production of copra.[4]

Copra is available in two different forms – edible copra and milling copra. While edible copra is prepared in the form of balls and cups, milling copra is prepared in the form of cups and chips.

In Kerala, lion's portion of copra traded is milling copra from which coconut oil is extracted. There are about 1318 Rotary units and 121 Expeller units in India, of which 75 per cent is located in Kerala (Appendix X). About 90125 MT of oil cake is obtained, a part of which is further processed in solvent extraction units. The oil so extracted is put mainly to industrial use.[5]

Coconut Oil

Production of coconut oil seems to be the basic intention behind coconut cultivation in Kerala. Coconut oil is preferred as a cooking medium by the Keralites and they are prepared to pay premium price for it. The price

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[4] "30 years of Coconut Industry", C.D.B., Kochi, 1999, pp.30-32.

[5] Coconut Statistics, 2001, C.D.B., Kochi.

of one quintal of coconut oil is more or less equivalent to the price of 1000 coconuts all along the west coast.[6]

Price Determination of Copra and Coconut oil

The Market price determination system existing in Kochi market for copra and coconut oil is centuries old. The daily price of copra and coconut is determined based on the price of coconut oil. It is estimated that 150-155 kg of copra can be produced from one thousand coconuts. The trade in coconut and copra is just as any other commercial crops. The local traders or copra makers purchase the coconuts directly from the cultivators and after processing into copra sell them either to big dealers in important commercial centers or to the millers directly. Majority of the millers are procuring a major part of their required copra in this manner. The wholesalers send the copra to other states. There exist some unwritten rules between the copra makers and oil millers regarding the quality, price, the time lag for making the payment (Credit period) and about other trade practices.

Nearly half of the total copra produced in Kerala is sent to other states in the form of copra as such. Therefore, the Keralites have no say in determining the demand and price of copra and coconut oil. It is often

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[6] V.T. Markose and P.T. Thomas, 'Impact of Minimum Support price for Copra on Market price of Coconut Products", Indian Coconut Journal, June 2000, pp.11-14.

determined by the traders, in the markets outside the state, who are big oligopolies.

The price of copra also is determined on the basis of the price of coconut oil i.e., if 62.5 per cent of the price of coconut oil and 31 per cent of the price of oil cake are added together, it will be equal to the price of copra. Generally, from 1.5 quintal of copra one quintal of coconut oil and half a quintal of oil cake are obtained.[7]

The price of coconut oil all over India is governed by the price at Kochi market. Though Kochi market is under the supervision of Cochin Oil Merchants Association (C.O.M.A), the price is determined through the interaction of demand and supply forces. Trading is allowed only through approved brokers (Dallals) of C.O.M.A. If trade is fixed between the seller and buyer, the broker concerned will inform the matter to C.O.M.A. The trade is to be carried out between a fixed time - i.e., from 10 A.M. to 4 P.M. every day. The starting price for the trade of the day is known as 'opening price' and the last price fixed for the trade of that day is known as 'closing price'. The closing price is published next day in newspapers as the market

[7] "Coconut Processing and Marketing", Coconut Development Board, Kochi-1996, pp.39-41.

price at Kochi. The brokers record the variations in prices at various intervals during the day and send a detailed report to the Association in writing.[8]

Forward Trading in Coconut Products

Even though coconut has been included among the oil seed category, the price stability of coconut and its products could not be achieved yet. The huge fall in prices during good harvest season and the rise in prices during off-season has affected the cultivators and thereby the economy of Kerala adversely. Since Kerala's economy is very much dependent upon coconut sector, such erratic price behaviour is detrimental to the state's economy. The price of coconut in Kerala is determined on the basis of the price behaviour of coconut oil which is highly unstable. An effective measure suggested to curb the disturbing variations in coconut oil prices was 'Forward trading'.[9]

In Forward trading the price for coconut oil is fixed two months in advance. Here a contract for sale for a particular price on a future date is taking place. This is very helpful for both the traders and cultivators. It is also useful for the ultimate consumers (Forward trading prices of various months for one quintal of coconut oil during the years 2002 to 2004 have been given in Appendix XI).

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[8] Ibid., pp.67-68.

[9] Coconut Processing and Marketing, C.B.B., Kochi, 1996, pp.39-41.

Forward trading was in vogue in Kochi market even before independence, which was functioning in a good manner. Later in 1956 Forward Market Commission was formed as per the Forward Market Regulation Act. Since then Forward Trading in Coconut Oil came under the complete control of the commission. Consequently forward trading in coconut oil was carried on in Kochi market by C.O.M.A. In Alappuzha also there was Forward Trading in Coconut oil.

In 1971 there occurred scarcity for edible oils throughout India. So in order to control price rise the central government banned forward trading for all edible oils, including coconut oil. Nevertheless, this measure did not help control prices, instead there occurred much ups and downs in coconut oil prices again.

Forward trading in coconut oil was reintroduced in October 2001. Since then it is being controlled by a separate independent company named First Commodities Exchange of India Ltd. which was promoted as a guarantee company by C.O.M.A. and First Commodities Clearing Corporation of India Ltd.

Price behaviour of Coconut Oil

Inspite of the development of technologies for a number of value added non-traditional coconut products, coconut industry in our country is still dependent on a single commodity viz., coconut oil. As such any erratic or

violent fluctuations in the price of coconut oil will directly influence the whole industry. Product diversification is the only remedy to tide over the situation. The extent of variation in coconut oil price for last ten years has been shown in table 4.3.

TABLE 4.3

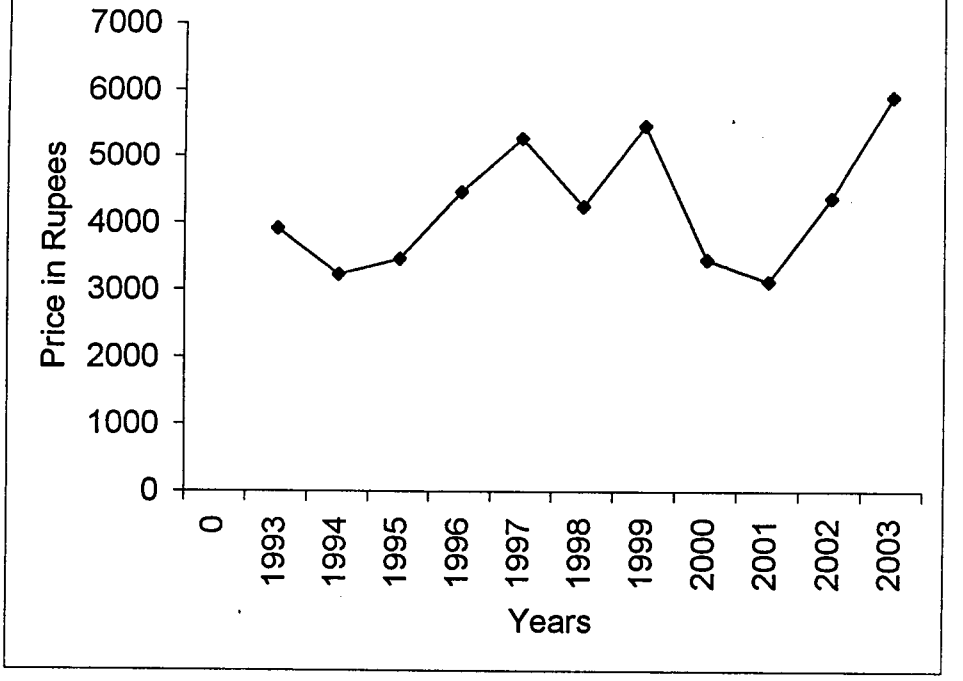
Variation in coconut oil price at kochi market in Kerala for the years since 1993-2003

Years	Rupees per quintal
1993	3915
1994	3234 (-17.39)
1995	3460 (+6.99)
1996	4456 (+28.78)
1997	5258 (+18.00)
1998	4234 (-19.47)
1999	5446 (+28.62)
2000	3447 (-36.70)
2001	3118 (-9.54)
2002	4348 (+39.45)
2003	5866 (+34.91)

Source: Compiled from the records of C.D.B Kochi,
(Figures in parenthesis show increase/decrease percentage)

Over the years from 1993-2003 there were so many ups and downs in coconut oil prices of Kochi market which is also depicted in figure 4.1. It is evident from the figure that there is an increasing trend since 2001.

Figure 4.1. Chart showing variation in coconut oil prices at Kochi market for the years from 1993-2003



The high price and the erratic price behaviour of coconut oil coupled with the availability of low-priced substitute oils have been responsible for the reduced use of coconut oil in soap manufacturing. However, coconut oil finds extensive use in the food industry due to its specific properties such as low melting point, resistance to oxidative rancidity, pleasing flavour and easy digestibility. Coconut oil is preferred as a source of fat in the preparation of infant milk powder, ice cream, confectionery and bakery products. Coconut oil is also used for surface spray for biscuits to impart glossy appearance and to act as a moisture barrier. Coconut oil is used for edible purpose mainly in

Kerala and the border areas of Tamil Nadu and Karnataka adjoining the state. While packed brands of coconut oil were a few till some years back, there are more than 80 brands of coconut oil available in the market at present.[10]

Three-fourth of the market share of the branded coconut oil segment is controlled by three or four reputed firms located in Mumbai, Calcutta and Bangalore. These firms have also export market mainly in Gulf countries. Branded coconut oil in consumer packs marketed by most of the firms is meant for toiletry uses even though a few firms in Kerala including KERAFED market packed oil as a cooking oil under the brand name KERA.

Past trend is indicative of the fact that increasing demand for fats and oils has been captured by the two oils – palm oil and soyabean oil – and the coconut oil could not make a dent in the scenario of increasing demand.

The price trend of coconut products was moving in tune with the seasonal fluctuation in Kerala but with expansion of coconut in other regions, especially in Tamil Nadu, the seasonal fluctuations have little impact on price trend because of lean season of Kerala coincided with the peak season of other regions and vice versa. The months April and May are the peak harvest season in Kerala where as it is different in Tamil Nadu.[11]

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[10] Dr. M.V. George and Chandra Sekhara Pillai, "Marketing strategy for stabilisation of coconut prices", Indian Coconut Journal, September: 1999, pp.41-43.

[11] Ibid.

Coir Products

The fibrous husk covering the inner shell of the coconut is the raw material for various coir products like coir yarn, mats, mattings, carpets, geotextiles etc.

Among the Indian states the largest concentration of coir is in Kerala. For historical reasons the coir industry has taken deep root in Kerala. This is because Kerala is the largest producer of coconuts contributing as much as 45 per cent of total production and also because of the existence of natural retting facilities and extraction of golden fibre from retted husk by manual labour.

Out of the 6044 units engaged in the manufacture of coir and coir products, 4525 units are located in Kerala. The state shares more than 90 per cent of the total quantity of coir products exported from the country. The coir industry in Kerala provides employment to 3.16 lakhs people in the state and earns foreign exchange to the tune of Rs.1.80 crores.[12]

At the current level of production only about 30 per cent of the annual production of coconut husks in India is put to industrial use.[13]

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[12] T.B. Nanda Kumar, "Recent developments in Coconut industry in India with special reference to Kerala", C.D.B Kochi, Indian Coconut Journal, March, 1998, p.11.

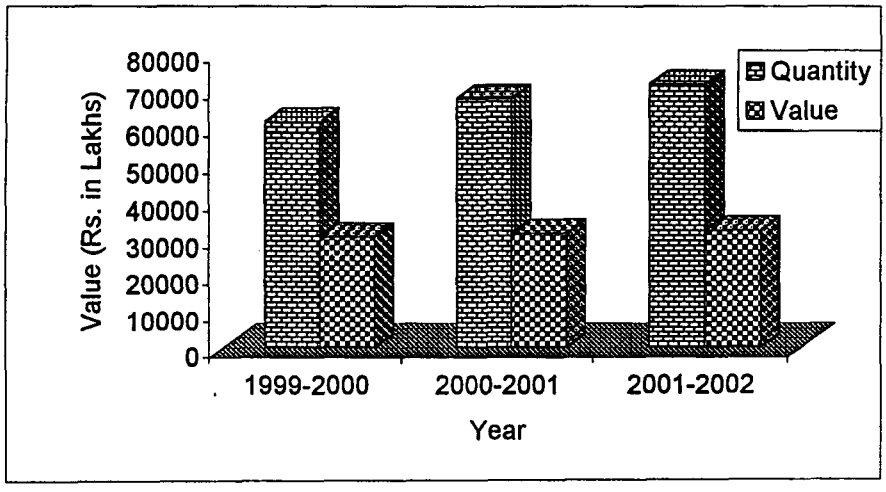
[13] E.B. Unni, "How coconut waste become an eco-friendly exportable product", The Economic Times, 12th October 1998.

Kerala accounts for more than 90 per cent of the coir product exported from the country annually. The coir plays a vital role in the export trade of Kerala and helps the country to earn foreign exchange to the tune of about 300 crores per annum (Appendix XII).

Of the various coir products, the items which showed percentage increase in 2001-02, compared to 2000.01, were curled coir (7.3 per cent), coir geo textiles (24.94 per cent), Handloom mats (5.79 per cent), Power loom mats (13.1 per cent) and Rubberised coir (18.07 per cent).

When the overall position is considered, the export quantity which was 61030.88 tonnes in 1999-2000 rose to 67493.08 tonnes in 2000-01 and further rose to 71334.81 tonnes in 2001-02, showing a percentage increase of 10.58 and 5.69 respectively for 2000-01 and 2001-02. This is has been depicted in figure 4.2.

Figure 4.2. Diagram showing Quantity and Value of Coir Products Exported from India during 1999-00 to 2001-02



Toddy

The multi-product nature of the coconut tree has long been recognised. It was in the 17th century that Robert Knox, an Englishman in describing the various virtues of the coconut tree referred to it in glowing terms:

".....the coconut tree affordeth meat, drink, and clothe, true but far short to my own knowledge, besides I shall add corn, toddy, wine, vinegar, oil, milk and honey, all eatables, but besides it affordeth other necessaries as mats, brooms, bottles, dishes and ropes".

Toddy tapping is a traditional coconut based industry, where 2.5 lakhs of people belonging to the weaker sections of the society in the country are employed and find their means of living. Of this 1.20 lakhs people are in Kerala. Apart from tapers, salesmen in the toddy shops, those who carry the toddy to shops, those who keep it for fermentation etc. are employed in this field. The district wise number of registered and non-registered labourers employed in this sector and the number of toddy shops has been given in Appendix XIII.

Coconut vinegar and arrack are also manufactured from the fermented toddy. Distillation of coconut toddy yields Arrack which is marketed as coconut fenny in the State of Goa. Coconut jaggery manufacturing is prevalent as a cottage industry in Tamil Nadu, Lakshadweep and Goa. All these provide job opportunities to rural people.

Tapping starts when the palms are about five years old, but income is derived earlier from mature fruit production. Palms are selected for high concentration of sugar in the toddy, and for high yield, as much as four litres per spathe each day. The inflorescence, thick and long, grows regularly and frequently. The palms should have a strong semi dwarf trunk. Tapping is done from the unopen inflorescence when the second spathe emerges. When the spathe is 40 cm long, it is squeezed by hand to soften it and gradually pulled down and held in place with a string, so that eventually the toddy in the spathe can flow down ward into a container.

After six days the spathe should be in position for tapping. It is then cut about 6 cm from the tip. A cylinder of Bamboo or Aluminium is attached to the cut end of the spathe to collect the sap coming out. Toddy collection is made between 6 A.M and 9 A.M and again between 3 P.M and 5 P.M every day. About 3 mm of the spathe is cut off at every collection. A single spathe can be tapped for about one month.

Tender Coconuts

Tender coconut water is consumed as a thirst-quenching beverage which is proved to be a source of many vital ingredients to human health. It is a wonderful refreshing beverage. It is rich in minerals and vitamins and has the medicinal property of reducing many internal discomforts of human body.

In Kerala trade in tender coconut has not made much progress as in other states. In West Bengal more than 80 per cent of the total coconut production is consumed as tender nuts while in Karnataka, Andhra Pradesh and Tamil Nadu, it accounts for 20-24 per cent of total production.[14]

In Kerala, since copra making, oil extraction and coir making are widespread, the consumption and therefore, trade in tender coconut was not popular till recently.

Nature of Sales

Out of the 180 stalls under study, all of them offered tender coconuts for sale both during summer and non-summer days (Table 4.4). However, the number of tender nuts offered for sale is greater in the central region as compared to the other two regions in both seasons.

TABLE 4.4

Sale of tender nuts in stalls mean sales per day (Number of nuts)

Region	Mean Sales per day per stall						Overall Average (Per day)
	During Summer			During Non-summer			
	Minimum	Maximum	Average	Minimum	Maximum	Average	
Northern	108	142	125	63	87	75	100
Central	284	392	338	118	228	173	255.5
Southern	92	98	95	54	62	58	76.5

Source: Survey data

[14] Indian Coconut Journal, October 2003, p.4.

A minimum number of 284 nuts and maximum number of 392 tender nuts have been sold (mean sales 338 nuts) per day in the central region during summer days and a minimum number of 118 and maximum number of 228 nuts during non-summer days (Mean sales 173 nuts) the overall mean sales per day in this region being 255.5 nuts per day. The reason for this better performance of the stalls in central region could be due to the presence of the C.D.B. which created an awareness among the people about tender coconut consumption, as a thirst-quenching drink.

A minimum number of 108 nuts and maximum number of 142 nuts have been sold (Mean sales 125 nuts) in the Northern region per day during summer days and a minimum number of 63 and maximum number of 87 nuts during non-summer days (mean sales 75 nuts). The overall sales per day in this region is 100 nuts per day.

A minimum number of 92 nuts and maximum number of 98 nuts have been sold (mean sales 95 nuts) per day in the southern region during summer days and a minimum number of 54 and maximum number of 62 nuts during no-summer days (Mean sales 58 nuts). The overall sales per day in this region is 76.5 nuts per day.

Variation in selling price

There are variations as well as differences in the selling price of tender nuts among the stalls and also between regions and seasons (table 4.5).

TABLE 4.5

Selling price of tender nuts – Mean price per unit

Region	Mean Price per unit (in Rupees)					
	Summer			Non-Summer		
	Minimum	Maximum	Average	Minimum	Maximum	Average
Northern	7	7.5	7.25	6	65	6.25
Central	7	8.0	7.50	5	6.0	5.50
Southern	9	10.0	9.50	7	8.0	7.50

Source: Survey data

It can be noted from table 4.5 that Average price per unit is high for tender nuts in the southern region during both summer as well as non-summer days (Rs.9 and Rs.7 respectively). Such differences in selling price could be due to the difference in the location of the stalls. Stalls located near or on the outskirts of urban/city centres have sold tender nuts at lower prices than those located at further places on the National Highways. Moreover, stalls that procured tender nuts locally have sold at a lower price than those procured through other traders.

The difference in selling price of tender nuts among seasons could be due to change in the demand for tender nuts, which primarily might be due to change in the consumers' buying behaviour. Again, difference in selling price of tender nuts among stalls could be due to the difference in the quality of tender nuts procured by the stalls of different regions. For instance, tender

nuts procured from the farms of Kerala itself may possess good qualities when compared to those procured from Tamil Nadu areas.

Temporal variations in demand

Temporal variations in the demand of tender nuts are indicated in Table 4.6. It is found that high sales occurred during summer days largely between February and May months and in a few cases till June month. The sale was moderate during October to January and till March in a few cases. The sale was low during June to November and the lowest during July. This temporal variation in the demand for tender nuts also differed among the stalls located in different regions.

TABLE 4.6

Temporal variations in the sale of tender nuts - Month wise

Region	Months of the year		
	High sale	Moderate sale	Low sale
Northern	April – June	December – March	July – November
Central	February – May	December – January	June - November
Southern	March – May	October – February	June - September

Source: Survey data.

In the Northern region High sale occurred during April – June while low sale occurred during July – November. December – March was the period of moderate sale in this region.

In the central region February – May was the period during which high sales occurred while low sale occurred during June – November. December – January was the period of moderate sale in this region.

In the southern region high sales occurred during March – May while low sales occurred during June – September. October to February was the period of moderate sale in this region.

When expressed on the basis of a single month in each case, the month of 'May' may be considered as the month of High sale December represents the month of moderate sale and July may be considered as the month of low sale.

Such temporal variations in the demand for tender coconut could be due to variations in the climatic and monsoon factors. For instance, the Month of May is the month of peak summer in Kerala, while during the month of December temperature is very low. In the month of July monsoon will be on its peak in almost all regions of Kerala.

Market share of Tender nuts

To study about the market share of tender nuts questions were asked only to cool bars coming under different regions. Items like branded beverages like cola, sugar cane, juice, fruit juice, mineral water etc. were taken to be competing products of tender coconut. Sales affected for each of

the product items in each cool bar was analysed to assess the market share of tender nuts (Table 4.7).

TABLE 4.7

Market share of tender coconuts in cool bars

Product / Region	Percentage sale of different drinks						
	Tender coconut	Branded cool drinks	Sugar cane juice	Fruit juice	Mineral water	Others	Total
Northern	24	38	7	8	10	13	100
Central	28	40	8	10	10	4	100
Southern	22	42	9	10	10	7	100
Average	24.66	40	8	9.33	10	8	100

Source: Survey data.

Variations could be seen in the share of tender nuts between regions. It can be noted from table 4.7 that on an average the percentage share of Tender nuts to total sales of different drinks comes to 24.66 percent as against 40 percent for branded cool drinks like cola, orange drink etc.

Region wise, the share of Tender nuts is more (ie. 28 percent) in the central region as against 24 and 22 percent respectively in northern and southern regions. The share of branded cool drinks is more ie. 42 percent in the southern region whereas it is 38 and 40 percent in Northern and central regions. The share of Mineral, water showed equal share in all the 3 regions ie. 10 percent. The share of 'other items' is more in the Northern region ie. 13

percent while it is 4 and 7 percent respectively in central and southern regions. In 'Other items' were included Milma butter milk, soda water, Avil milk, Lemon juice etc. Avil milk is popular in the Malabar areas of Northern region. The market share of tender nuts is also depicted in Figure 4.3.

Figure 4.3. Market share of tender coconuts sold in cool bars

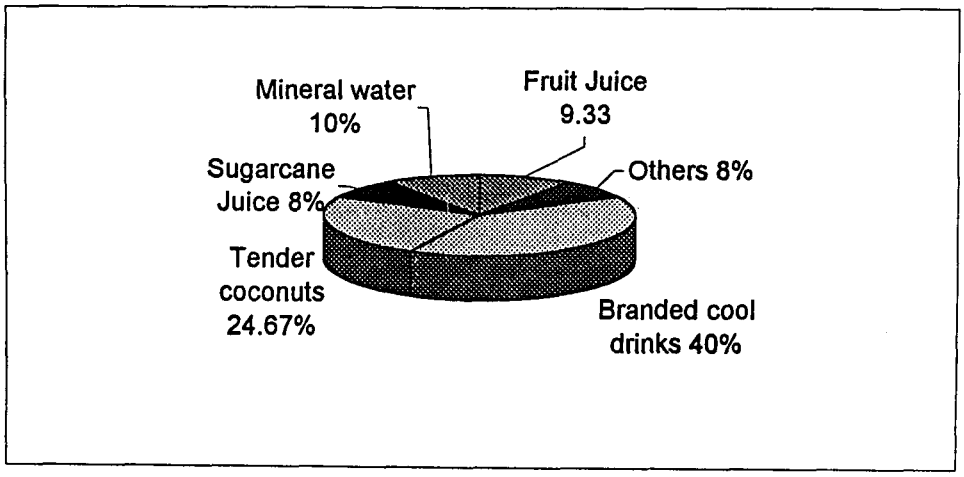


TABLE 4.8

Experience of dealers in tender nut business

Period (years)	North		Central		South		Overall	
	No.	%	No.	%	No.	%	No.	%
Below 5	23	39	29	38	28	47	80	44.44
6 – 10	30	50	26	58	27	45	83	46.11
11 – 15	4	6	2	4	3	5	9	5.00
16 – 20	1	2	2	3	1	2	4	2.22
Above 20	2	3	1	2	1	1	4	2.23
Total	60	100	60	100	60	100	180	100.00

It is clear from table 4.8 that of the total 180 stalls, 83 stalls ie. 46.11 percent, are having experience in selling tender coconuts for 10 years period. At the same time, 80 stalls ie. 44.44 percent, are having experience in selling tender coconuts below 5 years. This shows that the entry of stalls into this field was considerable during the last 5 years.

Only 5 percent of stalls have experience in the field above 10 years. The percentages of stalls having experience above 15 and 20 years are almost equal ie. 2.22 and 2.23 percentages. From these it can be inferred that tender coconut business has become very popular only during the last 10 year's period in Kerala.

TABLE 4.9

Category of people who consume tender coconuts – dealers' view (in percent)

Region / Category of people	North	Central	South	Overall (Per cent)
	%	%	%	%
Children	2	4	3	3.00
Youngsters	11	13	10	11.33
Middle-aged	50	54	51	51.67
Aged	37	29	36	34.00
Total	100	100	100	100.00

It is clear from table 4.9 that middle aged people are the main consumers of tender coconut. The overall percentage of dealers who opine so comes to comes to 51.67 percent. The popularity is much less among children. The percentage of dealers who opine children to be the consumers of tender coconut is only 3 percent. According to 34 percent of dealers, aged people are consumers of tender coconut who consume more. The overall percentage of dealers who see youngsters as the main consumers of tender nuts is 11.33 percent.

Region-wise, the percentages of dealers who consider middle aged people as the main consumers of tender nuts are: 50 percent in the North, 54 percent in the central and 51 percent in the south.

The region wise percentage of dealers who opine 'aged people' as the main consumers of tender nuts are 37 percent in North, 29 percent in central and 36 percent in the south.

TABLE 4.10

Method adopted to cut tender coconut by dealers (in percent)

Region / Method	North	Central	South	Overall per cent
	%	%	%	
Cut with sharp Knife	89	78	81	82.67
Cut using modern device	11	22	19	17.33
Total	100	100	100	100.00

The traditional method of cutting tender coconut is that the nut is held in one hand and struck a few times with a heavy knife. After consuming the water the meat is scooped out with a spoon. Considerable practice is necessary before acquiring this skill as the nut should be cut with least possible number of cuts by avoiding injury. People having this skill are only few in number. Because of the risk involved, only a few people learn this craft. This is a major factor which deters people from establishing Elaneer pandals or stalls in most places.

In short, the traditional method of cutting tender coconut is difficult, time consuming and risky. But with the help of a device developed by the Kerala Agricultural University, the time needed to cut a tender coconut is just 2 to 3 seconds.

In the present study, the respondents were asked whether they were using the device or not. It is clear from table 4.10 that, the overall percentage of those who cut tender coconut with a knife comes to 82.67 percent. ie. they are still adopting the traditional method. Region-wise 89 percent in the North, 78 percent in the central and 81 percent in the south are adopting the traditional way. It is also clear from the table that only 17.33 percent of stalls are using the modern device. Region-wise, their proportion comes to 11 percent in the North, 22 percent in the central and 19 percent in the south.

So it can be inferred from the above that, majority of tender coconut dealers are still adopting the traditional method to cut tender coconuts.

New Coconut Products

Emphasis on product diversification and by-product utilisation has resulted in the development of several new products like coconut cream, coconut milk, spray dried coconut milk powder, vinegar, packed tender coconut water etc. Most of these products have entered the phase of commercial production. All these products possess good export potential. Countries like Philippines, Indonesia, Sri Lanka etc have made much headway in the manufacture, marketing and export of these products.

Even as the C.D.B has organised a lot of publicity programmes for the development of new diversified products from coconut, majority of people are not aware of them. Here no reliable data is available to explain the volume of trade, price trend etc of the new coconut products, as conventional products are still ruling the roost.

In the foregoing pages discussions were made on the trade pattern of coconut and its products. Since coconut cultivators in Kerala face so many problems at farm level itself, which may directly or indirectly influence the marketing of their produce, in the next chapter an analysis of the various problems faced by cultivators in the marketing of the coconuts has been attempted.

CHAPTER 5

PROBLEMS OF COCONUT MARKETING

Marketing is as important as production to any producer. Because it creates value to the product, it pays revenue to the producer and more than these, it directs the producer as to whether continue or stop production. To a farmer, marketing is something more than production, due to certain inherent features that neither the production can be controlled/regulated in tune to market changes due to predominance of natural forces affecting production functions, nor can marketing be performed in tune to market requirements due to his own internal constraints. Hence farmers remain with chronic problem that they neither derive the advantages of their production/productivity increase nor the advantages of better marketing. [1]

Agriculture is traditional mass industry which has shifted from subsistence level to surplus production stage due to Green Revolution and the other rural development measures in the form of better infrastructure like irrigation, high yielding varieties of hybrid seeds, chemical fertilisers, labour, and cost efficient equipments etc. [2]

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[1] Dr. B. Subbaraj and Dr. R.K. Singh, "Marketing of Coconuts, Disposal Strategies of Farmers", *Indian Coconut Journal*- March, 2003,p.1.

[2] G. Singaiah & M.C. Bora, "Farm Marketing Practices, Problems and Reforms", *Agricultural Marketing*- July-September: 1988, pp.18-20.

One of the noteworthy achievements in the recent history has been that during the last four decades agricultural production grew faster than what has been predicted and its growth has been more than the growth of population.[3]

It is apt to recall the findings of Dantwala Commission on co-operative Marketing (1966) and F.A.O (1988) that agricultural production is abundant in our country while the problem is with distribution (Marketing). In all the years farmers were deprived of the benefits of increased production in terms of market price and vice versa. Equalization of demand and supply functions in agricultural marketing is far from anybody's guess.

Coconut farmers are not exempted from the above phenomenon. They have very little control over production as also on marketing. This warrants to have a probe on the marketing practices of coconut cultivators.

In this chapter an attempt has been made to analyse the problems involved in coconut marketing at cultivator level in Kerala.

Holding capacity and storage

The study revealed that, on an average majority (62.08 percent) of respondents dispose their coconuts immediately on harvest; while 37.92 per cent dispose 'later' (Table 5.1).

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[3] "*Economic and Political Weekly*", July 3, 1999, p.6.

TABLE 5.1

Disposal habit of cultivators

(Region wise)

Region / Disposed habit	North	Central	South	Average
	%	%	%	%
Immediately on harvest	62.50	57.50	66.25	62.08
Later	37.50	42.50	33.75	37.92
Total	100	100	100	100

Source: Survey data.

Region wise, 66.25 per cent (the highest) from the south, 62.5 per cent from the North and 57.5 per cent of respondents (the lowest) from the central regions dispose their coconuts immediately on harvest.

The percentage of those who answered 'later' is the highest (42.5 per cent) in the central region, while it is the lowest 33.75 per cent in the south.

It is, therefore, clear that most cultivators, irrespective of region, dispose their coconuts immediately on harvest itself.

The study made it clear that the holding capacity of the 'marginal' holders is lower than other two category of holders because 70.24 per cent (the highest) of them dispose of their coconuts immediately on harvest while only 29.76 of them dispose 'later' (Table 5.2).

TABLE 5.2

Disposal habit of cultivators

(Holding size wise)

Size / Disposal Habit	Marginal	Small	Big
	%	%	%
Immediately on harvest	70.24	64.10	51.28
Later	29.76	35.90	48.72
Total	100	100	100

Source: Survey data

The holding capacity is the highest among big holders because the percentage of those reported 'immediately on harvest' is the lowest (51.28 percent) among them.

Thus, it can be inferred that with increase in the size of holdings of the cultivators, their holding capacity also increases.

The study disclosed that, on an average 50.83 per cent (the highest) of respondents dispose off the coconuts on harvest, because of 'financial stringency'. 33.77 per cent reported 'absence of storing facility' as the reason. 15.4 per cent (the lowest reported 'indebtedness to the buyer' (Table 5.3).

TABLE 5.3

Reason for disposing immediately on harvest

(Region wise)

Region / Reason	North	Central	South	Average
	%	%	%	%
Financial stringency	44.00	50.00	58.49	50.83
Absence of storing facility	42.00	34.78	24.53	33.77
Indebtedness to buyer	14.00	15.22	16.98	15.40
Total	100	100	100	100

Source: Survey data.

Region wise, 58.49 per cent (the highest) from the south, and 44 per cent (the lowest) from the North stated financial stringency as the reason for disposing of their coconuts immediately on harvest.

42 per cent (the highest) from the North, and 24.53 per cent (the lowest) from the south reported 'absence of storing facility as the reason for disposing immediately on harvest.

16.98 per cent (the highest) from the south, and 14 per cent (the lowest) from the North reported 'indebtedness to the buyer' as the reason.

Thus, it is clear that, irrespective of region, financial stringency of the cultivators is the main reason why they dispose their coconuts immediately on harvest.

Holding size wise, the study made it clear that 'financial stringency' is the main reason among 'marginal' and 'small' holders, as 60 per cent (the highest) and 57.63 per cent of them respectively stated it as the reason. (Table 5.4).

TABLE 5.4

Reason for disposing immediately on harvest

(Holding size wise)

Size / Reason	Marginal	Small	Big
	%	%	%
Financial stringency	60.00	57.63	30.00
Absence of storing facility	22.00	23.73	62.50
Indebtedness to buyer	18.00	18.64	7.50
Total	100	100	100

Source: Survey data

At the same time, only 30 per cent of big holders stated it as the reason for disposing their coconut immediately on harvest.

Conversely, 62.5 per cent (the highest) of big holders reported 'absence of storing facility' as the reason, while it is 23.73 per cent among small holders and 22 per cent (the lowest) among 'marginal' holders.

When only 7.5 per cent (the lowest) of big holders reported 'indebtedness to the buyer' as the reason, it is 18.64 per cent among 'small' holders and 18 per cent (the lowest) among 'marginal' holders.

Thus, it can be inferred that 'marginal' and small cultivators dispose their coconuts immediately after harvest mainly because of 'financial stringency' while big cultivators dispose mainly because of 'absence of storing facility'.

Storing involves the holding and preservation of commodities through time. It is an exercise of human skill by which commodities are protected from deterioration and surplus is carried over for future consumption during the period of scarcity. The storage function creates time utility and regulates the supply significantly. It helps avoid a glut in the market and a crash in prices during peak periods.[4]

As far as place of storing is concerned, the study disclosed that, on an average, only 26.58 per cent of respondents have a permanent storehouse to store their coconuts. (Table 5.5).

[4] Shakuntala Gupta, "*Marketing of Agricultural Products*", Anmol Publications Pvt. Ltd. New Delhi: 1996, pp.111-113.

TABLE 5.5

Place of storing by cultivators

(Region wise)

Region / Storing place	North	Central	South	Average
	%	%	%	%
Fully in store house	25.00	32.00	22.73	26.58
Fully in farm ground	21.43	20.00	27.27	22.90
Partly in store house and partly on ground	53.57	48.00	50.00	50.52
Total	100	100	100	100

Source: Survey data.

22.67 per cent of respondents do not have a permanent storehouse to store their produce and therefore, they store fully on the farm ground. This may affect the quality of the coconuts from the point of view of future disposal. 50.52 per cent (the highest) of respondents reported that they store partly in store house and partly on the farm ground.

Region wise, 32 per cent (the highest) from the central region, and 22.73 per cent (the lowest) from the south, store their coconuts in a permanent storehouse.

It is, therefore, clear that majority of coconut cultivators, irrespective of region, in Kerala do not have permanent storehouse to store their coconuts for future.

Holding size wise, the study revealed that 45.83 per cent (the highest) of small holders are storing their coconuts fully in storehouse. Next to them 23.68 per cent of big holders also store fully in storehouse. At the same time, nobody from marginal holders store fully in a permanent storehouse (Table 5.6).

TABLE 5.6

Place of storing by cultivators

(Holding size wise)

Size / Storing place	Marginal	Small	Big
	%	%	%
Fully in store house	0.00	45.83	23.68
Fully on farm ground	76.92	20.83	5.26
Partly in storehouse and partly on the ground	23.08	33.34	71.06
Total	100	100	100

Source: Survey data.

Conversely, when 76.92 per cent (the highest) of marginal holders store fully on the farm ground itself, it is 20.83 per cent among small holders and 5.26 per cent (the lowest) among the big holders.

When 71.05 per cent (the highest) of big holders 'store partly in the store house and partly on he ground', it is 33.34 per cent among small holders and 23.08 per cent (the lowest) among marginal holders.

Thus, it can be inferred that only small holders and to some extent big holders are having a permanent storehouse to store their coconuts after harvest. Marginal holders usually store on the farm ground itself which may deteriorate the quality of the coconuts.

As far as duration of storing is concerned, the study disclosed that, on an average, 40.71 per cent (the highest) of respondents store coconuts for 3-6 months. 31.34 per cent store upto 3 months. 19.51 per cent store for 6 month-1 year and 8.44 per cent (the lowest) store for 'above 1-year' (Table 5.7).

TABLE 5.7

Duration of storing coconuts by cultivators

(Region wise)

Region / Duration	North	Central	South	Average
	%	%	%	%
Up to 3 months	28.57	20.00	45.45	31.34
3-6 months	42.86	52.00	27.28	40.71
6 months-1 year	21.43	28.00	9.09	19.51
Above 1 year	7.14	0.00	18.18	8.44
Total	100	100	100	100

Source: Survey data.

Region wise, 45.45 per cent (the highest) of respondents in the south, and 20 per cent (the lowest) in the central region store for up to 3 months.

52 percent (the highest) in the central region and 27.28 per cent (the lowest) in the south store for 3-6 months.

It is, therefore, clear that, majority of cultivators in Kerala, keep their coconuts in store for up to 6 months. Only low percentage of cultivators store beyond 6 months.

The study made it clear that with increase in size of holding of the cultivators, the duration of holding coconuts in store also increased i.e., when 76.92 per cent (the highest) of marginal holders store for 'upto 3 months', it is 33.33 per cent among small holders and 13.16 per cent (the lowest) among big holders (Table 5.8).

TABLE 5.8

Duration of storing coconuts by cultivators

(Holding size wise)

Size / Duration	Marginal	Small	Big
	%	%	%
Upto 3 months	76.92	33.33	13.16
3-6 months	23.08	33.33	52.63
6 months-1 year	0.00	29.17	21.05
Above 1 year	0.00	4.17	1.16
Total	100	100	100

Source: Survey data.

Conversely, when 52.63 per cent of big holders store for '3-6 months', it is 33.33 per cent among 'small' holders and 23.08 per cent (the lowest) among, marginal holders.

Thus, it can be inferred that 'marginal' holders store their coconuts for comparatively lesser duration when compared to big and small holders.

Value addition by cultivators

Regarding the extent of value addition by cultivators the study revealed that, 50.93 per cent (the highest) of respondents who store their coconuts sell away their coconuts when need for money arises; without any further processing. 38 per cent of respondents ' process copra and sell the copra'. 8.22 per cent of the respondents 'process copra, make oil and sell oil and 2.85 per cent (the lowest) 'make seedlings and sell them' (Table 5.9).

TABLE 5.9

Extent of value addition by cultivators

(Region wise)

Region / Answer	North	Central	South	Average
	%	%	%	%
Sell when need for money arises	57.14	32.00	63.64	50.93
Process copra and sell copra	39.29	52.00	22.73	38.00
Process copra, make oil and sell oil	3.57	12.00	9.09	8.22
Make seedlings and sell	0.00	4.00	4.54	2.85
Total	100	100	100	100

Source: Survey data.

Region wise, 63.64 per cent (the highest) of respondents from the South, and 32 per cent (the lowest) from the central region reported that they sell the coconuts after storing, when need for money arises.

52 per cent (the highest) of respondents from the central region, and 22.73 per cent (the lowest) from the south reported that they 'process copra and sell the copra'.

12 per cent (the highest) or respondents from the central region and 3.57 per cent (the lowest) from the North reported that they 'process copra, make oil and sell the oil'.

Thus, it is clear that majority of cultivators sell the coconuts without adopting any sort of value addition, even after storing. Thus value addition at cultivator level is very poor in Kerala.

The study also revealed that, 61.54 per cent (the highest) of marginal holders who store coconuts, sell their coconuts when need for money arises. It is 52.63 per cent among big holders and 41.67 per cent (the lowest) among small holders (Table 5.10).

TABLE 5.10

Extent of value addition by cultivators

(Holding size wise)

Size / Answer	Marginal %	Small %	Big %
Sell when need for money arises	61.54	41.69	52.63
Process copra and sell copra	38.46	50.00	31.58
Process copra, make oil and sell oil	0.00	8.33	10.53
Make seedlings and sell	0.00	0.00	5.26
Total	100	100	100

Source: Survey data.

When 50 per cent (the highest) of small holders 'process copra and sell it' it is 38.46 per cent among marginal holders and 31.58 per cent (the lowest) among big holders. Only lower percentage of cultivators 'make coconut oil and sell it'.

Thus, it can be inferred that value addition on a consistent level is undertaken by big farmers only. Eventhough, small farmers undertake copra processing to a certain extent, they do not go beyond that. Marginal cultivators exhibit a very poor position in the matter of value addition.

Problem of Selling-Presence of Intermediaries:

What are the marketing channels open to the producers to sell their farm produce? The farmer may sell his produce at the farm in his village market or in the local market. As he moves from the farmhouse to the village and to the market, he incurs an additional cost of transportation. Besides,

when he goes to sell in the local market, he incurs an opportunity cost of not being engaged in the production process on the farm. In other words, he would be willing to sell his produce at a lower price in his village or at his farm vis-à-vis the price prevailing in the market.

Since information is a priced commodity in marketing the buyers of the produce would not only like to economise on marketing fee but also like to gain from lack of prefect information about the market price on the part of the producer-seller. By arguing with the producer-seller, that they have to bear the transport cost of carrying his produce from the village to the market, they are likely to offer him lower than the prevailing market price.

Since farmers are already willing to accept lower than market price, the deals in the market are likely to be struck at a price lower in the village than that prevailing in the market. If so, only small producers who have low staying capacity, would be selling a part or whole of their produce in the village. They may be followed by some of such medium and large farm households that are in stringencies. Some of these farmers may have taken money in advance and committed the sales in the village.[5]

The study revealed that, on an average, 49.08 per cent of respondents (the highest) sell their produce to the local dealer. 31.08 per cent of respondents sell to the dealer in the town. 15.31 per cent sell to the big dealer

[5] *Ibid.*, pp.105-106.

in the city and 4.53 per cent of respondents (the lowest) sell to the co-operative society (Table 5.11).

TABLE 5.11

Dealers to whom cultivators sell their produce

(Region wise)

Region / Type of dealer	North	Central	South	Average
	%	%	%	%
Local dealer	51.28	49.30	46.67	49.08
Dealers in the town	17.95	36.62	38.67	31.08
Big dealer in the city	25.64	5.63	14.60	15.31
Co-operative society	5.13	8.45	0.00	4.53
Total	100	100	100	100

Source: Survey data.

Region wise, 51.28 per cent (the highest) from the North, and 46.67 per cent (the lowest) from the south sell their produce to the 'local dealer'.

38.67 per cent (the highest) of respondents from the South, and 17.95 per cent (the lowest) from the North sell their produce to the dealer in the town.

25.64 per cent (the highest) of respondents from the North, 14.66 per cent from the South and 5.63 per cent (the lowest) from the central region sell their produce to the big dealer in the city. Only very low per cent of respondents sell to the co-operative society.

Thus, it is clear that most coconut cultivators in Kerala, irrespective of region, sell their produce to the local village dealer and to some extent to the dealer in the town. Only a negligible percentage of them sell to the co-operative societies.

Table 5.12 reveals that 79.36 per cent (the highest) of marginal holders sell their produce to the local dealer, while it is 51.81 per cent among small and 21.79 per cent (the lowest) among big holders.

TABLE 5.12

Dealers to whom cultivators sell their produce

(Holding size wise)

Size / Type of dealer	Marginal	Small	Big
	%	%	%
Local dealer	79.36	51.81	21.79
Dealer in the town	17.46	37.35	34.62
Big dealer in the city	1.59	9.64	33.33
Co-operative society	1.59	1.20	10.26
Total	100	100	100

Source: Survey data.

When 17.46 per cent (the lowest) of marginal holders sell to the dealer in the town, it is 37.35 per cent (the highest) among small holders and 34.62 per cent among big holders.

When 33.33 per cent (the highest) of big holders sell to the 'Big dealers in the city, it is 9.64 per cent (the lowest) among marginal holders.

Likewise, when 10.26 per cent (the highest) of big holders sell their produce to the co-operative society, it is 1.59 per cent among marginal holders and 1.20 per cent (the lowest) among small holders.

Thus, it is clear that while marginal and small holders sell their produce mainly to the local dealer, big holders sell mainly to the dealers in the town or city, thus avoiding one or two links in the chain of intermediaries, and thus gaining more advantage in prices. The practice of selling through co-operatives is very low among all categories of cultivators.

Regarding the reason for not contacting co-operatives, the study, disclosed that, on an average 44.79 per cent (the highest) of respondents reported 'complicated formalities' as the reason for not contacting co-operatives to sell their produce. 26.59 per cent of respondents reported 'Delay in taking decision' as the reason for not contacting co-operatives.

Only lower percentages of respondents reported other reasons. (Table 5.13)

TABLE 5.13

Reasons for not contacting co-operatives by cultivator for selling produce

(Region wise)

Region / Reason	North	Central	South	Average
	%	%	%	%
Delay in taking decision	22.97	32.81	24.00	26.59
Misbehaviour on the part of officials	6.76	9.38	9.33	8.49
Exorbitant charges	9.46	7.81	8.00	8.42
Complicated formalities	47.30	39.06	48.00	44.79
No facility in my locality	13.51	10.94	10.67	11.71
Total	100	100	100	100

Source: Survey data.

Region wise, 48 per cent (the highest) of respondents from the South, and 39.06 per cent (the lowest) from the central region reported 'complicated formalities' as the reason.

Thus, it is clear that, irrespective of region, coconut cultivators in Kerala consider 'complicated formalities' as the main reason for not contacting co-operatives to sell their produce. Next to that 'Delay in taking decision' is considered to be the main reason.

Holding size-wise, when 50 per cent (the highest) of 'small' holders reported 'complicated formalities' as the reason for not contacting 'co-operatives' for selling their produce, which it is 44.29 per cent among big

holders and 39.34 per cent (the lowest) among 'marginal' holders (Table 5.14).

TABLE 5.14

Reasons for not contacting co-operatives by cultivators for selling produce

(Holding size wise)

Size / Reason	Marginal	Small	Big
	%	%	%
Delay in taking decision	34.42	19.51	27.14
Misbehaviour on the part of officials	11.48	6.10	8.57
Exorbitant charges	6.56	10.98	7.14
Complicated formalities	39.34	50.00	44.29
No facility in my locality	8.20	13.41	12.86
Total	100	100	100

Source: Survey data.

Conversely, when 34.42 per cent (the highest) of marginal holders reported 'Delay in taking decision' as the reason it is 27.14 per cent among big holders and 19.51 per cent (the lowest) among 'small holders'.

Problem of Transportation:

Regarding problem of transportation, the study revealed that, on an average, 46.25 per cent (the highest) of the respondents reported 'abnormal cost' of transportation as the main problem they face in transporting their produce from the farm to the market (Table 5.15). Next to that 26.25 per cent

of respondents reported 'improper roads' as the problem of transportation. 13.75 per cent reported 'None'. 7.08 per cent of respondents reported 'Means of transportation not available' as the problem and 6.67 per cent (the lowest) reported 'Harassment by Government officials at check post etc as the problem of transportation they face in transporting their produce from the farm to the market.

TABLE 5.15

Transportation problems faced by cultivators

(Region wise)

Region / Problems	North	Central	South	Average
	%	%	%	%
Improper Roads	31.75	22.50	25.00	26.25
Means of transportation not available	7.50	6.25	7.50	7.08
Abnormal cost	47.50	37.50	53.75	46.25
Harassment by officials at check post etc.	6.25	12.50	1.25	6.67
None	7.50	21.25	12.50	13.75
Total	100	100	100	100

Region wise, 53.75 per cent (the highest) of respondents from the South, and 37.5 per cent (the lowest) from the central region reported 'Abnormal cost' as the problem associated with transportation of their produce from the farm to the market.

31.25 per cent (the highest) of respondents from the North, and 22.5 per cent (the lowest) from the central region reported 'improper roads' as the problem of transportation they face.

Only lower percentages of respondents reported other problems from all the three regions.

Thus, it can be inferred that 'Abnormal cost' and 'Improper roads' are the two main problems that coconut cultivators face as transportation problems in the marketing of their produce in Kerala.

Effort to enhance on-farm income by cultivators:

Inter cropping/Mixed farming:

Being a small holders crop, coconut under monocropping does not provide adequate income and gainful employment to the dependent families. In a situation where coconut industry is threatened with recurring uncertainties, the need for a farm practice that augments the coconut farm income becomes imperative. Adoption of coconut based intercropping/mixed farming (also called Integrated Farming System or I.F.S) is the suggested alternative to boost the income from a unit holding.

Inter cropping:

Coconut being a widely spaced crop with its rooting pattern and canopy coverage offers much scope for integrating a variety of crop

combination in the inter spaces. The basic natural resources such as soil and sunlight available in a coconut garden are not fully utilised under monocropping. In a coconut holding with palms spaced at 7.5 x 7.5 metres apart, nearly 75 per cent of the land goes unused by the palm. In coconut gardens with palms which are more than 25 years of age 45-50 per cent of the sunlight is infiltered to the ground without interception. In order to utilise this natural resources along with soil nutrients and water efficiently, the practice of inter cropping is followed in one or the other way by coconut farmers. To increase the productivity as well as the returns per unit area, growing of different suitable crops in the inter spaces in the coconut garden is recommended.

Mixed farming:

The integration of animal categories like dairying, poultry, bee keeping, sericulture, pisciculture etc in a coconut garden along with compatible crops including fodder crops is termed as coconut based Mixed farming system. This system helps in maintaining soil health and ecological balance.

The study disclosed that, on an average, majority (60.41 per cent) of respondents reported 'practice none' (Table 5.16). That means they neither practice inter cropping nor mixed farming. 24.17 per cent reported 'Inter

cropping' only. 7.92 per cent reported 'mixed farming only'. 7.5 per cent of respondents (the lowest) reported 'practice both'.

TABLE 5.16

I.F.S practiced by cultivators

(Region wise)

Region / I.F.S	North	Central	South	Average
	%	%	%	%
Inter cropping only	22.50	31.25	18.75	24.17
Mixed farming only	6.25	12.50	5.00	7.92
Practice both	3.75	5.00	13.75	7.50
Practice none	67.50	51.25	62.50	60.41
Total	100	100	100	100

Source: Survey data.

Region wise, 67.5 per cent (the highest) of respondents reported 'practice none' from the North and 51.25 per cent (the lowest) from the central region.

31.25 per cent (the highest) from the central region reported 'Inter cropping only' and 18.75 per cent (the lowest) from the South.

12.5 per cent (the highest) from the central region reported 'Mixed farming only' and 5 per cent (the lowest) from the South.

13.75 per cent (the highest) from the South reported 'Practice both' while only 3.75 per cent (the lowest) from the North reported so.

So, it is clear that most coconut cultivators in Kerala do not practice both Inter cropping or Mixed farming together. If at all they practice, it is 'Inter cropping only' and that is concentrated more in the central region as compared to other two regions. The higher awareness in the central region could be due to the impact of role played by C.D.B in propagating the benefits of Inter cropping among the cultivators of this region.

Holding size wise, it is evident from table 5.17 that the percentage of respondents who practice 'Inter cropping only' is the highest (43.59 per cent) among big holders, while it is 22.62 per cent among small holders and only 6.42 per cent (the lowest) among marginal holders.

TABLE 5.17

I.F.S practiced by Cultivators

(Holding size wise)

Size / I.F.S	Marginal	Small	Big
	%	%	%
Inter cropping	6.42	22.62	43.59
Mixed farming	1.28	14.29	7.69
Practice both	2.56	5.95	14.10
Practice none	89.74	57.14	34.62
Total	100	100	100

Source: Survey data.

The percentage of respondents who practice 'mixed farming only' is the highest (14.29 per cent) among small holders while it is 7.69 per cent among big holders and only 1.28 per cent (the lowest) among marginal holders.

The percentage of respondents who 'practice both' is the highest (14.1 percent) among big holders, while it is 5.95 per cent among small holders and 2.56 per cent (the lowest) among marginal holders.

Conversely, when 89.74 per cent (the highest) of 'marginal holders' practice none' it is57.14 per cent among small holders and 34.62 per cent (the lowest) among big holders.

Thus, it is clear that, with increase in the size of holding of the cultivators, their habit of practicing either Inter cropping or Mixed farming, also increases, with the only exception that the adoption level of Mixed farming is more among small holders than big holders.

Regarding the increase/decrease of yield due to the introduction of I.F.S, the study disclosed that, on an average, 29.66 per cent (the highest) of respondents reported 21-30 per cent increase in yield and only 1.11 per cent of respondents (the lowest) reported 'No change in yield'. Nobody reported 'less yield' on account of introducing I.F.S.

Toddy tapping:

As for toddy tapping habit, the study revealed that, majority of respondents (on an average 62.08 per cent) reported that they 'never' offer their coconut trees for toddy tapping (Table 5.18).

TABLE 5.18

Habit of toddy tapping among cultivators

(Region wise)

Region / Answers	North	Central	South	Average
	%	%	%	%
Always	7.50	8.75	7.50	7.92
Sometimes	22.50	28.75	38.75	30.00
Never	70.00	62.50	53.75	62.08
Total	100	100	100	100

Source: Survey data.

30 percent of respondents reported that they 'sometimes' offer. Only 7.92 per cent (the lowest) reported that they 'always' offer their coconut trees for toddy tapping.

Region wise, 70 percent (the highest) from the North, and 53.75 per cent (the lowest) from the South reported 'never'.

38.75 per cent (the highest) from the South, and 22.5 per cent (the lowest) from North reported 'sometimes'.

8.75 per cent of respondents (the highest) from the central region and 7.5 per cent (the lowest) each from North and South reported 'always'.

Thus, it is clear that, though majority of cultivators, irrespective of region in Kerala, never offer their coconut trees for toddy tapping, of those who offer, the percentage of those offer 'sometimes' is the highest in the South, as compared to other two regions and the percentage of those who 'always' offer, though lower, is the highest in he central region.

Holding size-wise, the study disclosed that (table 5.19), the percentage of respondents who offer coconut trees for toddy tapping either 'always' or 'sometimes' increases with increase in their size of holdings. i.e. when only 1.28 per cent (the lowest) of marginal holders and 8.34 per cent of small holders 'always' offer coconut trees for toddy tapping, it is 14.1 per cent (the highest) among big holders.

TABLE 5.19

Habit of toddy tapping among cultivators

(Holding size wise)

Size / Answer	Marginal	Small	Big
	%	%	%
Always	1.28	8.34	14.10
Sometimes	16.67	32.14	41.03
Never	82.05	59.52	44.87
Total	100	100	100

Source: Survey data.

Like wise, when only 16.67 per cent (the lowest) of respondents belonging to marginal holders and 32.14 per cent belonging to small holders 'sometimes' offer, it is 41.03 per cent (the highest) among big holders.

Thus, it is clear that the habit of offering coconut trees for toddy tapping increases in accordance with increase in size of holdings of cultivators.

As for the reason for not offering coconut trees for toddy tapping, the study revealed that (table 5.20), on an average, 44.73 per cent (the highest) of respondents reported 'psychological resistance' as the reason for not offering coconut trees for toddy tapping. Next to them, 25.33 per cent reported 'Fear that yield will decline' as the reason. 23.13 per cent of respondents reported 'palms are not suitable' as the reason. Only 6.81 per cent (the lowest) of respondents reported 'Fear that lease agreement will not be met' as the reason.

TABLE 5.20

Reason for not offering coconut trees for toddy tapping

(Region wise)

Region / Reason	North	Central	South	Average
	%	%	%	%
Psychological resistance	44.64	50.00	39.54	44.73
Fear that yield will decline	21.43	22.00	32.56	25.33
Fear that lease agreemental will not be met	7.14	4.00	9.30	6.81
Palms are not suitable	26.79	24.00	18.60	23.13
Total	100	100	100	100

Source: Survey data.

Region wise, 50 per cent (the highest) of respondents from the central region, and 39.54 per cent (the lowest) from the South reported 'psychological resistance' as the reason.

32.56 per cent (the highest) from the South, and 21.43 per cent (the lowest) from the North reported 'Fear that yield will decline' as the reason.

Thus, it is clear that 'psychological resistance' is the main reason on the part of the coconut cultivators for not offering coconut palms for toddy tapping. To some extent, 'Fear that yield will decline', and 'palms are not suitable' also act as reasons.

Holding size wise, the study disclosed that (table 5.21), while 48.44 per cent (the highest) of marginal holders reported 'psychological resistance' as the reason for not offering coconut palms for toddy tapping, it is 44 percent among small holders and 40 per cent (the lowest) among big holders.

TABLE 5.21

Reason for not offering coconut trees for toddy tapping

(Holding size wise)

Size / Reason	Marginal	Small	Big
	%	%	%
Psychological resistance	48.44	44.00	40.00
Fear that yield will decline	28.13	28.00	14.28
Fear that lease agreement will not be met	3.13	8.00	11.43
Palms are not suitable	20.30	20.00	34.29
Total	100	100	100

Source: Survey data.

Like wise, when 28.13 per cent (the highest) of marginal holders reported 'Fear that yield will decline' as the reason, it is 28 per cent among small holders and 14.28 per cent (the lowest) among big holders.

Conversely, when 11.43 per cent (the highest) of big holders reported 'Fear that lease agreement will not be met' by the party as the reason for not offering coconut palms for toddy tapping, it is 8 per cent among small holders and 3.13 per cent (the lowest) among Marginal holders.

It is, therefore, clear that marginal holders do not offer coconut palms for toddy tapping mainly because of the reasons 'psychological resistance' and 'Fear that yield will decline' while the big holders mainly reported the reasons such as 'Fear that lease agreement will not be met' and 'palms are not suitable'.

Harvest of Tender coconuts

Regarding the habit of harvesting tender coconuts by cultivators, the study revealed that, on an average, nobody reported 'always'. That means nobody from the respondents is having the habit of harvesting tender coconuts 'always' from their coconut gardens. Only 11.25 per cent reported 'sometimes' harvest. A majority of 88.75 per cent reported that they 'never' harvest tender coconuts to be sold (Table 5.22).

TABLE 5.22

Habit of tender coconut harvest among cultivators

(Region wise)

Region / Answer	North	Central	South	Average
	%	%	%	%
Always	0.00	0.00	0.00	0.00
Sometimes	7.50	17.50	8.75	11.25
Never	92.50	82.50	91.25	88.75
Total	100	100	100	100

Source: Survey data.

Region wise, 17.5 per cent (the highest) from the central region reported 'sometimes' while it is 7.5 per cent (the lowest) in the North.

When 92.5 per cent (the highest) of respondents from the North reported 'never', it is 82.5 per cent (the lowest) from the central region.

So, it is clear that most cultivators in Kerala 'never' harvest tender coconuts. Region wise, higher percentage of cultivators in the central region 'sometimes' harvest. This higher percentage in central region could be due to the awareness created by the C.D.B in that region about the benefits of harvesting tender coconuts.

Holding size wise, Table 5.23 discloses that, nobody from all the three categories of respondents 'always' harvest tender coconut for sale.

TABLE 5.23

Habit of tender coconut harvest among cultivators

(Holding size wise)

Size / Answer	Marginal	Small	Big
	%	%	%
Always	0.00	0.00	0.00
Sometimes	5.13	4.16	24.36
Never	94.87	95.24	75.64
Total	100	100	100

Source: Survey data.

When 24.36 per cent (the highest) of respondents from big holders reported 'sometimes' harvest, it is 5.13 per cent among marginal holders and 4.76 per cent (the lowest) among small holders.

Thus, it is clear that only big coconut cultivators harvest tender coconuts for sale. At the same time, nobody has the habit of 'always' harvesting tender coconuts for sale.

As for the reason for not harvesting tender coconuts, the study made it clear that, on an average 30.75 per cent (the highest) of respondents reported 'palms are not suitable' for tender nut harvest, while 5.19 per cent (the lowest) reported 'non-availability of labour' as the reason (Table 5.24).

TABLE 5.24

Reason for not harvesting tender nuts

(Region wise)

Region / Reason	North	Central	South	Average
	%	%	%	%
Psychological resistance	17.56	24.24	17.80	19.87
Non-availability of labour	6.76	6.06	2.74	5.19
Problem of finding dealer	16.22	21.21	23.29	20.24
Fear that yield will decline	29.73	10.61	31.51	23.95
Palms are not suitable	19.73	37.88	24.66	30.75
Total	100	100	100	100

Source: Survey data.

Region wise, 37.88 per cent (the highest) of respondents from the central region, reported 'palms are not suitable' as the reason while it is 24.66 per cent (the lowest) from the South.

When 31.51 per cent (the highest) of respondents from the South reported 'Fear that yield will decline' as the reason, it is 10.61 per cent (the lowest) from the central region.

Thus, it is clear that 'palms are not suitable' and 'fear that yield will decline' are the major reasons why coconut cultivators in Kerala do not harvest tender coconuts.

Holding size wise, the study revealed that (Table 5.25), when 25.68 per cent (the highest) of marginal holders reported 'psychological resistance' as the reason it is 13.56 per cent (the lowest) among big holders.

TABLE 5.25

Reason for not harvesting tender coconuts

(Holding size wise)

Size / Reason	Marginal	Small	Big
	%	%	%
Psychological resistance	25.68	18.75	13.56
Non-availability of labour	4.05	8.75	1.69
Problem of finding dealer	16.22	21.25	23.73
Fear that yield will decline	28.38	18.75	27.12
Palms are not suitable	25.67	32.50	33.90
Total	100	100	100

Source: Survey data.

Conversely, when 33.9 per cent (the highest) of big holders reported 'palms are not suitable' as the reason, it is 25.67 per cent (the lowest) among marginal holders.

Like wise, when 23.73 per cent (the highest) of big holders reported 'problem of finding dealer' as the reason for not harvesting tender nuts, it is 16.22 per cent (the lowest) among marginal holders.

Thus, it can be inferred that when, reasons like 'psychological resistance' and 'fear that yield will decline' are found to be important among marginal holders, reasons like 'palms are not suitable' and 'problems of finding dealer' are found to be important among small and big holders for not harvesting tender coconuts.

YIELD LOSS DUE TO DISEASES/PESTS

Coconut palm is affected by a number of diseases/pests, some of which are fatal while others reduce its vigour resulting in economic loss. 830 insects and mites, 173 fungi and 78 species of nematodes have been found to be associated with coconut.[6] Only a few of them cause serious damage to the crop.

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[6] *Indian Coconut Journal.* April 2001, p.8.

In India the root (wilt), tatipaka, thanjavur wilt, stem bleeding, budrot, lethal yellowing etc are the important diseases on coconut. In Kerala, the main reason for low productivity of coconut was the prevalence of root (wilt) disease. Recently, a pest known as 'Mandari' has also affected the coconuts palms which has resulted in the reduction of yield as well as deterioration of the quality of the husk throughout Kerala.[7]

The study revealed that of all the diseases/pests, the infestation level of 'Mandari' is the highest (Appendix XIV) i.e., 44.58 per cent of respondents reported that their coconut gardens have been affected by 'Mandari' by 40-50 per cent. 31.61 per cent of respondents reported the infestation level above 50 per cent. Nobody reported 'Not affected in the case of 'Mandari'. That means the coconut gardens of almost all the respondents have been affected by Mandari by atleast 10 per cent.

Next to Mandari, Root (wilt) is the main disease reported by the respondents. 45.42 per cent of the respondents (the highest) reported its infestation level by 0-10 per cent. 30.82 per cent of respondents reported 'Not affected' in its case. 16.25 per cent of respondents reported the infestation level by 10-20 per cent. Only 0.42 per cent (the lowest) of respondents reported the infestation level by 40-50 per cent.

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[7] *Ibid.*

The infestation level of 'Thanjavur wilt' is the lowest as 93.33 per cent of the respondents reported 'Not affected' in its case. Only 6.67 per cent of respondents reported its infestation level as 0-10 per cent.

In the case of all other diseases/pests, the infestation level is only upto 10-20 per cent. Beyond that the infestation level is either nil or negligible.

It is, therefore, clear that 'Mandari' and 'Root (wilt) are the two main disease/pest which have affected the coconut gardens in Kerala.

BY-PRODUCT UTILISATION: RESIDUE PARTS FROM COCONUT PALM:

The coconut is a very useful palm. If perhaps yields more useful products to the human race than any other tree in the world. The importance of the palm lies in the fact that not only does it supply food, drink and shelter but also provides raw-materials for a number of important industries.

Traditionally, coconut cultivators dispose the husk, spathe, petiole and leaves by burning or allowing these farm wastes to rot in the field. Studies have shown that burning of agricultural wastes cause air pollution, Soil erosion and even a decrease in soil biological activity that can eventually lead to decreased soil fertility. On the other hand, allowing farm residues to rot in the field may improve the productivity of the soil but the process of decomposition is very slow leading to accumulation of piles of agricultural

wastes that can cause phytosanitary problem to the coconut plantation since decaying debris is ideal breeding place for coconut pest like the rhinoceros beetle.[8]

Estimates showed that a fully bearing coconut plantation of one hectare could generate 12.75 tonnes of coconut residues per hectare per year.

TABLE 5.26

Estimated availability of coconut residue generated by fully bearing palm

Particulars	Weight Ton/ha/year	%
Husk	1.82	14.28
Spathe	0.57	4.47
Peduncle	1.40	10.98
Peliole	6.39	50.12
Leaves with mid ribs	2.34	18.35
Leaf sheath	0.23	1.80
Total	12.75	100

Dry weight basis. Source: Secondary data.

It can be observed from table 5.26 that the petiole accounts for 50.12 per cent of the total weight, with leaves 18.35 per cent including mid ribs, husk 14.28 per cent, peduncle 10.98 per cent, spathe 4.47 per cent and leaf sheath 1.80 per cent.

[8] R.N. Palomar & others, "Increasing farm income through processing and utilisation of coconut waste products", *Indian Coconut Journal*-October: 2001, p.2.

Agricultural residues can be a source of extra income. Residue parts from coconut plantation, like husk, fronds, spathe etc can be processed and transformed into excellent stabilised cement Bonded Boards or wall panels and corrugated roofing sheets at a much reduced production cost than the conventional cement block, galvanised iron sheets, asbestos panels or plywood sheets.

The study made it clear that, on an average, majority (63.14 per cent) of respondents reported that they sell their coconuts 'dehusked'. 36.86 per cent of them reported that they sell coconut with husk.

As for the utilisation of other residue parts like spathe, peduncle, petiol, leaves with mid ribs and leaf sheath the study disclosed that, on an average, majority of respondents (51.25 per cent) sell the residue parts to others for fuel and 8.34 per cent (the lowest) burn the residue parts as such in the garden itself.

Thus, it can be concluded that, the habit of selling away the residue parts and thereby making some earnings is more among big holders and to some extent among small holders. But Marginal holders either use them as fuel at home or leave carelessly in the garden.

ADOPTION LEVEL OF TECHNOLOGY UPGRADATION BY CULTIVATORS

Use of Climbing Machine:

A process often confronted by coconut cultivators in Kerala is the non-availability of tree climbing labour. Of late, many climbing labour have left the scene and migrated to other easier and attractive jobs, to acquire better social status. This has made the problem eve more severe. As a result the harvest of coconuts at the right time has become difficult which might have affected the marketing prospects of the produce by the coconut cultivators.

To tackle this problem and to make available sufficient tree climbers, the C.D.B launched a programme for training in coconut tree climbing and plant protection. The climbing is done by using a simple palm climbing device designed for the purpose. According to the programme, a palm climbing Machine was provided to each successful trainee free of cost.

Regarding the availability of climbing labour the study reveled that, on an average, majority of respondents (62.5 per cent) reported that they 'sometimes' face the problem of getting coconut tree climbing labour. 22.08 per cent reported that they 'always' face the problem. 15.42 per cent (the lowest) of respondents reported that they 'never' face the problem of getting climbing labour. This is revealed in the following table.

TABLE 5.27

Problem of availability of climbing labour faced by cultivators

(Region wise)

Region / Answer	North	Central	South	Average
	%	%	%	%
Always	35.00	22.50	8.75	22.08
Sometimes	60.00	58.75	68.75	62.00
Never	5.00	18.75	22.50	15.42
Total	100	100	100	100

Source: Survey data

Region wise, 35 per cent (the highest) of respondents from the North and 8.75 per cent (the lowest) from the South reported that they 'always' face the problem.

68.75 per cent (the highest) of respondents from the South, and 58.75 per cent (the lowest) of respondents from the central region reported that they 'sometimes' face the problem.

22.5 per cent (the highest) of respondents from the South, and 5 per cent (the lowest) from the North reported that they 'never' face the problem.

Thus, it is clear from the above that most coconut cultivators in Kerala, irrespective of region, face the problem of getting tree climbing labour to harvest their coconuts in time.

Holding size wise, the study disclosed that, the percentage of those face the problem of getting climbing labour 'always' is the highest among marginal holders and the lowest among big holders and the lowest among big holders. ie when 32.05 per cent of marginal holders face the problem, it is 28.57 per cent among small holders and only 5.13 per cent among big holders.

TABLE 5.28

Problem of availability of climbing labour faced by cultivators

(Holding size wise)

Size / Answer	Marginal	Small	Big
	%	%	%
Always	32.05	28.57	5.13
Sometimes	61.54	61.90	64.10
Never	6.41	9.53	30.77
Total	100	100	100

Source: Survey data

An almost equal percentage of respondents from all the three groups of holders reported that they 'sometimes' face the problem. ie it is 61.54 per cent among marginal holders, 61.90 per cent among small holders and 64.10 per cent among big holders.

The percentage of respondents who 'never' face the problem is the highest (30.77 per cent) among big holders while it is only 9.53 per cent among small holders and 6.41 per cent (the lowest) among marginal holders.

Thus, it can be inferred that, bigger the size of holdings, the lesser is the problem they face in getting climbing labour and vice versa. This could be due to the fact that many of the big holders usually maintain permanent climbing labour who are ensured of full work throughout the year. But marginal and small holders are not in a position to employ such permanent climbing labour.

Regarding the awareness of cultivators about climbing Machine, the study made it clear that, on an average, majority (52.92 per cent) of respondents reported that they 'know' about the climbing Machine. 47.08 per cent of respondents ported 'Do not Know'.

Conversely, when 67.95 per cent (the highest) of marginal holders reported 'do not know', it is 40.48 per cent among small holders and 33.33 per cent (the lowest) among big holders .

Thus, it can be inferred that bigger the size of holdings of the cultivators, the more is their awareness about climbing machine and vice versa.

Regarding the extent of use of climbing machine by cultivators, the study revealed that, on an average, only 1.33 per cent (the lowest) of

respondents reported 'always' use (Table 5.29), 29.29 per cent reported sometimes use and the majority 69.38 per cent of respondents reported 'Never' use.

TABLE 5.29

Use of climbing machine by cultivators

(Region wise)

Region / Answer	North	Central	South	Average
	%	%	%	%
Always	0.00	4.00	0.00	1.33
Sometimes	28.21	36.00	23.68	29.29
Never	71.79	60.00	76.32	69.38
Total	100	100	100	100

Source: Survey data

Region wise, nobody from the North and the South reported 'always' use. Only 4 per cent of respondents from the central region reported 'always' use.

Thus, it is clear that majority of cultivators in Kerala, who know about climbing machine, do not use it in their coconut gardens. Of those who use, the adoption level is higher in the central region as compared to other two regions.

The following table 5.30 makes it clear that the adoption level among. marginal holders is negligible because, nobody among them reported 'always' use. It is 2 per cent (the highest) among small holders and 1.92 per cent (the lowest) among big holders.

TABLE 5.30

Use of climbing machine by cultivators

(Holding size wise)

Size / Answer	Marginal	Small	Big
	%	%	%
Always	0.00	2.00	1.92
Some times	4.00	36.00	36.54
Never	96.00	62.00	61.54
Total	100	100	100

Source: Survey data

Thus, it is clear that, majority of cultivators, from all the three categories, do not use climbing machine in their coconut gardens. Of those who use, the adoption level is more among small and big holders while it is negligible among marginal holders.

TABLE 5.31

Reasons for not using climbing machine

(Region wise)

Region / Reason	North	Central	South	Average
	%	%	%	%
Psychological resistance	32.14	23.33	10.35	21.94
Difficult to operate	53.57	40.00	62.07	51.88
Time consuming	7.14	16.67	13.79	12.53
High Cost	7.15	20.00	13.79	13.65
Total	100	100	100	100

Source: Survey data

Regarding the reason for not using climbing Machine, the above table (table 5.31) discloses that, on an average, majority (ie 51.88 per cent) of respondents, opined 'difficult to operate' as the main reason for not using the climbing machine in their coconut gardens, and 12.53 per cent (the lowest) of respondents reported 'Time consuming' as the reason.

Region wise, 62.07 per cent (the highest) from the South, and 40 per cent (the lowest) from the central region opined 'difficult to operate' as the reason for not using climbing machine in their coconut gardens.

Thus, it is clear that, majority of coconut cultivators in Kerala, irrespective of regions, find the climbing Machine 'difficult to operate' because majority of the respondents stated it as the reason for not using.

Use of Modern Copra Dryer:

It may be noted that the raw coconut kernel contains around 50 per cent moisture. The chances for fungus attack is the maximum during the first 3-4 hours after deshelling. Therefore, during this crucial period, the moisture level has to be brought down to around 15 to 20 per cent. In the traditional sun-drying method, the split coconuts are kept for drying around 7'O clock in the morning. The maximum atmospheric temperature prevalent in Kerala region is around 20^0-30^0C even during summer. Moreover, there is every chance of sudden fall in temperature.

To overcome this lacuna, indirect heating of the kernel ensuring a temperature of around 65^0-70^0C for the first 4-5 hours is the alternative. Recently, a copra dryer has been developed in which the moisture level can be brought down to 6-7 per cent within 3-4 days. There are various models of modern copra dryers available in the market.

With the increased interest in packed oil for both edible and Toiletry uses, quality copra will have better market value. Drying of copra in modern dryers imparts better quality.

The study revealed that (table 5.32), on an average, 40.68 per cent, (the highest) of respondents depend on 'both sunlight and country smoke dryer' to dry their copra. 28.96 per cent of respondents reported 'dry in sunlight only. 16.57 per cent of respondents reported. 'Both sun light and modern dryer'. 13.79 per cent (the lowest) of respondents reported 'modern dryer only'.

TABLE 5.32

Method adopted to dry copra by cultivators

(Region wise)

Region / Method	North	Central	South	Average
	%	%	%	%
Dry in sunlight only	33.33	25.00	28.57	28.96
Both sunlight & country smoke dryer	41.67	37.50	42.86	40.68
Modern dryer only	8.33	18.75	14.29	13.79
Both Sunlight and Modern dryer	16.67	18.75	14.29	16.57
Total	100	100	100	100

Source: Survey data

Region wise, 33.33 per cent (the highest) of respondents from the North, and 25 per cent (the lowest) from the central region reported 'dry in sunlight only'.

48.86 per cent (the highest) of respondents from the South and 37.5 per cent (the lowest) from the central region reported 'Both sunlight and country smoke dryer'.

18.75 per cent (the highest) of respondents from the central region, and 8.33 per cent (the lowest) from the North reported 'Modern dryer only.

Thus, it can be inferred that those cultivators who process copra mainly depend on sunlight and country smoke dryer to dry copra. Adoption level of modern dryer is very low.

Holding size wise, the study disclosed that when 80 per cent (the highest) of respondents from marginal holders reported 'Dry in sunlight only', it is 35.71 per cent among small holders and only 6.25 per cent (the lowest) among big holders. The following table evidences this.

TABLE 5.33

Method adopted to dry copra by cultivators

(Holding size wise)

Size / Methods	Marginal	Small	Big
	%	%	%
Dry in sunlight only	80.00	35.71	6.25
Both Sunlight & Country smoke dryer	20.00	50.00	37.50
Modern dryer only	0.00	0.00	31.25
Sunlight & modern dryers	0.00	14.29	25.00
Total	100	100	100

Source: Survey data

When 50 per cent (the highest) of respondents from small holders reported 'Both sunlight and country smoke dryer', it is 37.5 per cent among big holders' and 20 per cent (the lowest) among marginal holders.

When 31.25 per cent of respondents from big holders, alone reported 'Modern dryer only', nobody from small and marginal holders reported so.

Thus, it is clear that the adoption level of modern dryer is confined to big holders only while marginal and small holder still depend, to a great extent, on conventional method of drying copra, like sunlight and country smoke dryer

INSTITUTIONAL SUPPORT TO CULTIVATORS

On account of the peculiar nature of agriculture, unless some sort of support and assistance is received by cultivators, it will not be a promising enterprise. This is because in a country like ours agriculture is very much exposed to the vagaries of nature. Coconut cultivation is not an exception to this because crop failure takes place every now and then not only due to the failure of Monsoon but also due the occurrence of diseases and pests. All these may lead to frequent ups and downs in the prices of coconuts.

Institutional support to coconut cultivators may be from specialised institutions like C.D.B, co-operatives K.A.U, C.P.C.R.I, Krishi Bavan etc. It may also be from the part of the Government through direct intervention in the form declaration of M.S.P offering subsidies for fertilizers etc. It may again be from financial institutions like banks in the form of agricultural loan at reduced interest rates etc.

Price Support Scheme (P.S.S) Vs Cultivators

Minimum Support Price (M.S.P)

The central government announces the M.S.P. for both Milling and Ball copra every year on the recommendations of the Commission for Agricultural Costs and Prices (C.A.C.P.). The commission visits the states concerned well before each season and collect relevant information with regard to the cost of cultivation of coconut, cost of production of copra etc. after holding discussions with coconut farmers, traders' associations, state governments, governmental organizations etc. The M.S.P. recommended is for a particular crop season and the commission makes its recommendations every year. Milling copra was included in the list of commodities under the purview of the commission in the year 1986 and subsequently edible ball copra was also added in 1996.[9]

The National Agricultural Co-operative Marketing Federation of India Ltd. (N.A.F.E.D) is the nodal agency for undertaking purchase of copra under the Price Support Scheme (P.S.S). The purchase would be effected through the state co-operative Marketing Federation (STATEFEDs) and oils seeds Growers Federation (OILFED)

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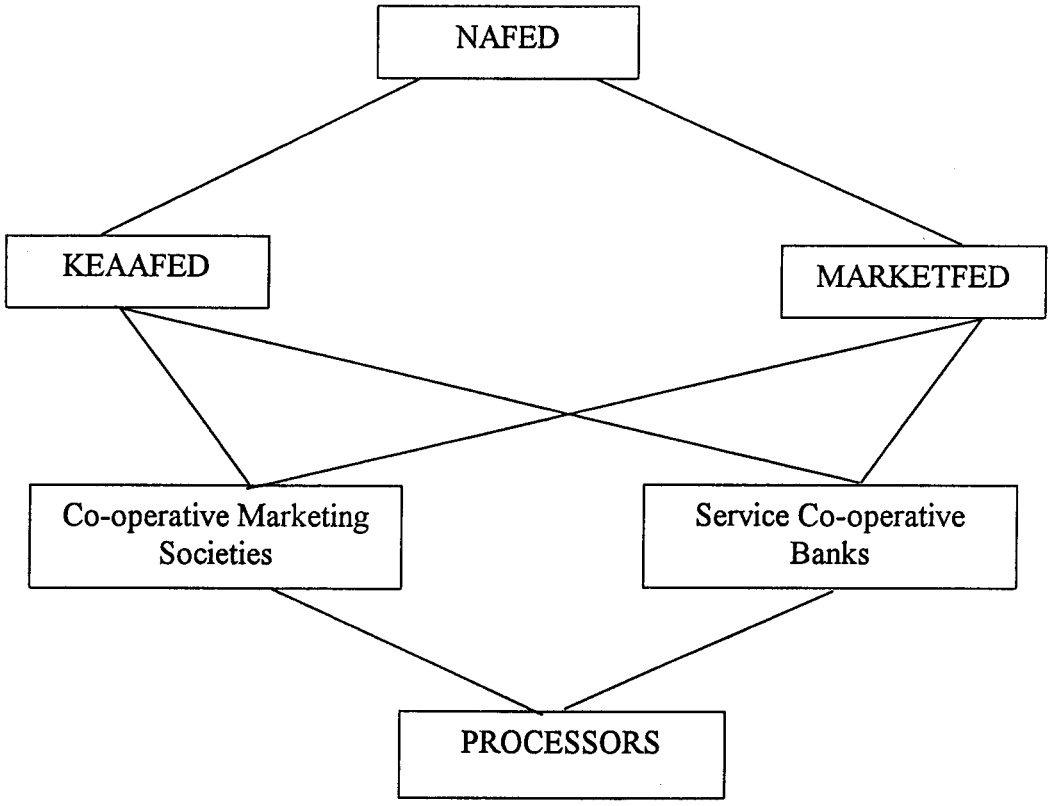
[9] V.T. Markose and P.T. Thomas, *Impact of Minimum support price for copra on Market Price of coconut products*, Indian Coconut Journal, June, 2000, p.11.

In Kerala state, the KERAFED and Market Fed are the procuring agencies which control a wide network of co-operative marketing societies as well as the service co-operative banks to undertake the marketing operations at the grass root level. The organization structure for procurement of copra in Kerala under the P.S.S. is given Fig. 5.1.

Figure 5.1

Organisation structure for procurement of Copra under P.S.S. in Kerala



Source: C.D.B. Kochi.

The scope of the present study is limited only to the M.S.P of Milling Copra and its impact on the market price in Kerala and thereby on the cultivators. Appendix XV depicts the MSP announced for milling copra since

1990 to 2003 and the average market prices of copra at Kochi market in peak harvest season and off season. It also presents the difference between the actual market price and the MSP of copra.

It can be observed from Appendix XV that there were wide fluctuations in the prices of copra during the peak season and lean season as well as in the yearly Average prices. Since the first announcement of M.S.P for milling copra in the year 1986, it was only in the year 1994 that the offseason average market price ruled below the M.S.P. The M.S.P for 1994 season was Rs.2350 per quintal while the offseason average market price was only Rs.2212 which was 6 percent less than the M.S.P. On many occasions during 1990, 1994, 1995, 1998 and 2000, 2001 and 2002 the average wholesale market price in the peak season ruled below the M.S.P. The downward movement of prices depicted a recurring trend, repeating the phenomenon every fourth year. An exception is noticed in the year 2000 when the cycle was repeated in the third year. In the years 2001 and 2002 also it continued. But in 2003 there was notable improvement.

Thus, even after the announcement of the M.S.P and the procurement of copra by the nodal agencies, the prices of copra and coconut oil ruled below the M.S.P.

Again, the benefit of P.S.S. is not often enjoyed by the cultivators. Instead it is pocketed by intermediaries like big dealers. This is because

majority of cultivators in Kerala are not copra processors. If at all they process copra, most of them sell away the copra either to the village dealer or to the dealer in the city or town. So it is the big dealers who are actually selling the copra to the procurement agencies and not the cultivator-processors themselves. The big dealers would have purchased all the marketable surplus from the cultivator – processors sufficiently in advance at lower prices.

For instance, if the average price per quintal of copra for the last 5 years is taken to be Rs.2500 per quintal and the average M.S.P. Rs.3250, the actual position can be explained as shown in Table 5.34.

TABLE 5.34

Extent of benefit pocketed by dealers under P.S.S.

	Rupees per quintal
Price for which dealers purchase from cultivator – processors (Average of last 5 years) market price	Rs.2500
Price for which dealers sell to procurement agencies (Average of last 5 years M.S.P)	Rs.3250
Difference	Rs.750 per quintal

Source: Secondary data

Regarding the extent of benefits enjoyed by the cultivators, the present study revealed that (table 5.35), majority of respondents do not get the benefit of M.S.P. declared by the government. On an average 82.5 per cent answered

'Never', 11.25 per cent answered 'Sometimes' and only 6.25 per cent answered 'Always'.

TABLE 5.35

Benefit of M.S.P. enjoyed by Cultivators (Region-wise)

Region / Answers	North	Central	South	Average
	%	%	%	%
Always	5.00	10.00	3.75	6.25
Sometimes	10.00	8.75	15.00	11.25
Never	85.00	81.25	81.25	82.50
Total	100.00	100.00	100.00	100.00

Source: Survey data.

Region-wise 85 per cent (the highest) from the North and 81.25 per cent each from Central and South answered 'Never'.

When 15 per cent (the highest) of respondents from the South answered 'Sometimes', it is 8.75 per cent (the lowest) in the Central region.

When 10 per cent (the highest) from the Central region answered 'Always', it is 3.75 per cent (the lowest) in the South.

Holding size-wise, the study made it clear that (table 5.36), with increase in the size of holdings of the respondents, the percentage of those answered 'Always' as well as 'Sometimes' also increase. i.e., when only 1.28 per cent of marginal holders and 1.19 per cent of small holders answered always, it is 16.67 in the case of big holders.

TABLE 5.36

Benefit of M.S.P. enjoyed by Cultivators (Holding size-wise)

Size / Answers	Marginal	Small	Big
	%	%	%
Always	1.28	1.19	16.67
Sometimes	1.28	8.33	24.36
Never	97.44	90.48	58.97
Total	100.00	100.00	100.00

Source: Survey data.

So it is clear that, if at all coconut cultivators get some benefit of M.S.P., it is the big cultivators only who are enjoying the benefit.

Thus, it can be inferred that the full benefit of M.S.P is not passed on to the grass root level. It is grabbed by the intermediaries. If N.A.F.E.D could purchase directly from the cultivator – processors the exploitation of the intermediaries can be eliminated.

Any sort of governmental support other than M.S.P offered to protect the coconut sector, time and again, also was not beneficial to the cultivators. For instance in February 2001, the Government of India increased the import duty for copra and edible oils. For copra it was raised from 35 per cent to 70 percent. But from closer analysis it can be seen that, this was only a technical increment which do not benefit the cultivators. This can be explained with the help of the table 5.37.

TABLE 5.37

Copra price in International Market Vs International Market

Copra price in international market per ton	Copra price in internal market per ton
210 dollars ie. Rs.9618 Add: 70 percent Import duty 6732 Total Rs.16600	M.S.P. Rs.32,500 Market Price Rs.21500

Source: Secondary data.

It can be seen that, internal market price is above import price to the extent of Rs.4900 (ie.21500 – 16,600). Thus even if some expenses for transportation costs etc. are also added, the import price would still be much below the market price.

Likewise, in the matter of coconut oil also the situation is not different. Here also the increase made in the import duty would not benefit the cultivators. The import duty was raised from 45 percent to 65 percent, except for soybean oil imported from the U.S.A. This can be explained with the help of the following table.

TABLE 5.38

Coconut Oil Price in the International market Vs Internal Market

Coconut oil price in international market per ton	Coconut oil price in internal market per ton
310 dollars ie. Rs.14200 Add: 65 percent Import duty 9230 ------ Total Rs.23430 ======	Rs.30,100 ======

Source: Secondary data

It can be seen that internal market price per ton of coconut oil is much above the imported price of coconut oil per ton to the extent of Rs.6670 (ie.30100 – 23430). Thus even if some additional expenses like transportation costs etc. are also added the import price would still be ruling much below the internal price.

This price differential for coconut products in India continues to be high since many years. In short, the P.S.S. through market intervention is not the grand panacea for correction of the illness of the coconut industry.

Support from other institutions:

In the present study, the respondents were asked to state the name of institutions from where they usually get assistance for items like seedlings, manure, pesticides, sprayer, pump set,. climbing machine, moisture meter,

modern dryer, Inter cropping & mixed farming. A detailed table is given in Appendix XVI depicting the percentages of respondents who reported the names of various institutions from where they get assistance for the items noted in the foregoing paragraph.

It is clear from Appendix XVI that, for items likes pump set, pesticides, sprayer, manure and seedlings, majority of respondents are approaching the Krishi Bavan. The respective, percentages being 98.48 per cent (the highest) for 'pump set', 89.28 per cent for pesticides, 88.46 per cent for getting 'sprayer', 65.95 per cent for getting ' manure', and 42.63 per cent (the lowest) for getting seedlings.

For assistance in items like 'Modern dryer' Moisture metre, Mixed forming assistance and climbing machine, more percentage of respondents approach K.A.U - the respective percentage being - 50 per cent (the highest) for getting 'modern dryer'. 43.05 per cent for getting 'Moisture metre', 39.85 per cent for getting assistance in connection with 'Mixed forming and 35.76 per cent (the lowest) for getting 'climbing machine'.

It is for assistance in 'Inter cropping' only more percentage of respondents get assistance from the C.D.B ie 34 per cent (the highest).

Thus, it can be inferred that coconut cultivators in Kerala, still see Krishi Bavans as the main institution for getting assistance for most of their

requirements. The role of co-operatives, C.D.B. and C.P.C.R.I. is to be further extended so that more cultivators can have access to them.

Since institutional support has become imperative for ensuring sustainable coconut production, the Government of India has set up a separate institution called the Coconut Development Board. The next chapter is devoted to have a peep into the role and functioning of the Board.

CHAPTER 6
ROLE OF COCONUT DEVELOPMENT BOARD

An autonomous body known as the Coconut Development Board (C.D.B.) was set up by the Government of India by virtue of the Coconut Development Board Act 1979. The Board came into existence on 12th January, 1981, with hea office at Kochi in Kerala. The developmental programmes of coconut received more attention after the formation of the Board.

The major functions of the Board, inter alia, include adopting measures for the development of coconut industry, recommending measures for improving marketing of coconut and its products, regulating import and export of coconut and its products, providing technical and financial assistance for cultivation, processing and marketing of coconut, fixing grade specifications and standards of coconut and its products, etc.

With the formation of the Board, the development programmes for coconut were given new dimensions by identifying thrust areas where efforts were to be concentrated. The decade prior to the formation of the C.D.B. witnessed a declining trend in production and productivity, with the area under the crop remaining almost stagnant. Fast spread of root (wilt) disease in Kerala further aggrevated the situation.

The first and foremost objective identified by the C.D.B. was, therefore, to create a sizable production potential for stepping up productivity, development of technology for product diversification and by-product utilisation and streamlining the marketing system of coconut and its products.

The developmental activities of the C.D.B. can be broadly classified as:

1. Activities relating to improvement of production and productivity.
2. Activities relating to processing.
3. Activities relating to marketing.
4. Publicity and extension activities.

1. Activities relating to improvement of production and productivity

Expansion of area in suitable regions was given top priority as a major development programme of the C.D.B. Apart from traditional areas, the crop was introduced successfully in non-traditional belts of the North and North eastern regions in the country. Similarly, the productivity improvement programme implemented by the C.D.B. made favourable impact at the all India level by reversing the negative trend in productivity. These include supplying of good planting materials, manure, pesticides, etc. along with suggesting integrated farming measures.

In order to cover up the shortage of quality planting materials the C.D.B. established Demonstration cum Seed Production farms (D.S.P. farms) and coconut nurseries in different regions in the country.

2. Activities relating to processing

When the C.D.B. came into existence, post harvest processing was in infancy and was confined to traditional copra processing and oil milling in the country. Development of technologies for product diversification within the country itself was, therefore, identified as the major thrust area and the C.D.B. has been successful in this venture to a great extent.

The major activities of C.D.B. in this direction were as follows:

(a) Aid to technological research in coconut based products.

(b) Setting up of pilot testing plants for the integrated coconut processing.

(c) Financial assistance to processing industries.

(d) Techno-economic studies, project preparation, surveys, seminars, etc.

(e) Financial assistance to artisans.

3. Activities relating to Marketing

To promote marketing of coconut and its products sales outlets were opened in different traditional and non-traditional areas in order to create awareness of coconut products among the people. In this direction the C.D.B. imparts:

(a) Market information and intelligence service.

(b) Market promotion.

4. Publicity and extension activities

The C.D.B. lays immense stress in undertaking organised publicity and extension activities to inform and educate the farmers, processors, traders, prospective entrepreneurs and the general public on the modern technologies and new venues in coconut culture and industry. The activities in this direction include:

(a). Production of publications

Production of extensive literatures, both periodicals and ad-hoc publications, is one of the main activities of C.D.B. Two monthly journals namely 'Indian Coconut Journal' in English and 'Indian Nalikera Journal' in Malayalam are the prominent items among them. These journals contain popular articles on different aspects of coconut cultivation and industry in India besides popular columns such as questions and answers, market review, market report, monthly operations in coconut gardens, news, statistics, etc.

(b). Production and Screening of Films

Production and screening of films with a view to educate and inform farmers, processors and others connected with coconut culture and industry is one of the important activities of the C.D.B.

(c). Exhibitions

Value addition to coconut and its by-products was emphasised in most of the exhibitions. These exhibitions provided opportunity for two-way communication which helped to convey the message of the Board to a wider section of the people. Sales of coconut publications were also arranged in the Board's stalls in the exhibitions. Units engaged in the manufacture of various new coconut products and coconut based handicrafts were also given opportunity to sell their products in the exhibitions as a product promotion measure. These exhibitions helped to widen the market for various coconut products. The exhibitions also provided an opportunity to the farmers, extension workers, policy makers, exporters and importers to know the potential of coconut and to have an understanding of the various coconut products available in the country.

(d). Publicity through Press and other media

Wide publicity was given to the activities of the Board through newspapers, All India Radio and Doordarshan and also through cable/private television network by releasing press notes and arranging media coverage of various functions/meetings.

(e). Technical Advice to Coconut Farmers and Entrepreneurs

A large number of farmers and others connected with coconut industry were given technical advice in person and by post. Besides, questions received from farmers and others on various aspects of coconut cultivation and industry and their answers were regularly published in the Board's periodicals under the column 'You Ask – We Answer'. The technical officers of the Board also participated in many agricultural seminars organized by State Departments/agencies, which helped to convey the Board's message to a wider section of the public.

(f). Training Programme

The CDB organises training programmes in climbing and plant protection of coconut and in scientific coconut cultivation in various parts of the country. The objective of the programme was to expose the farmers to scientific methods of coconut cultivation and processing.

Product Diversification Programme

With the establishment of the C.D.B. the product diversification in coconut was given high priority. The Research & Development efforts in this direction gained momentum as a result of the emphasis given for value addition in coconut in different programmes of the Board and the various research programmes sponsored by the Board through the existing research

institutions in the country. Now indigenous technologies are available for the manufacture of coconut cream, spray dried coconut milk powder, coconut water based vinegar and for the preservation and packing of tender coconut water. The Board gives advice on technologies available to entrepreneurs.

With the liebralisation policy introduced by the Government of India in the industrial sector, many units manufacturing diversified products have come up in the country utilizing imported technologies.

Besides preserved tender coconut water, coconut cream, coconut milk, coconut desert, coconut water, virgin coconut oil and desiccated coconut are the products manufactured and marketed by some small firms in attractive packs.

There are two firms in Kerala manufacturing coconut cream. One is Fresh Coconut Products Ltd. (Freshco), Irinjalakuda and the other is Bombay based Indian Beverages Ltd. in Palakkad. The former has received the know-how from the Board while the latter from Singapore.

Another new product that has entered the market is tender coconut water concentrate manufactured by Miracle Food Processors International Ltd., Perinthalmanna, Kerala Dinesh Beedi, Kannur has started manufacturing coconut cream by adopting low cost technology of Regional Research Laboratory (RRL), Thiruvananthapuram.

The know-how for the preservation and packing of tender coconut water developed by the Defence Food Research Laboratory (DFRL) Mysore with financial assistance from the Board has been transferred to three private firms based in Tamil Nadu, Karnataka and Assam.

Two units in Thrissur district in Kerala are manufacturing coconut water based vinegar. One of these units has received the know-how from the Board. The Board has transferred the vinegar technology to another unit in Kannur.

Two other units in Kerala are manufacturing virgin coconut oil from coconut milk in the traditional method. This is an ideal oil for marketing as a baby oil.

Even though more than 60 firms are manufacturing desiccated coconut in India, only two firms are in the line in the state. One firm in Kochi markets desiccated coconut manufactured by Lakshadweep Development Corporation under the former's brand name.

If concerted effort is made to popularise the product in the state and the product is made available in small packs for one time use for household purpose, the desiccated coconut industry has a bright future in the state since the desiccated coconut made with Kerala coconuts is comparatively tastier. Most of the desiccated coconut units in India are concentrated in Karnataka. In the organised sector, desiccated coconut is mainly consumed by

confectionary units. In the unorganised sector the main consumers are bakeries and sweet makers.

Organisation structure of the C.D.B.

The Head Office of the Board functions at Kochi in Kerala. The three Regional offices of the Board are located in Bangalore, Patna and Chennai. The Regional Office in Bangalore was established in 1982-83. The development activities in the states of Karnataka, Maharashtra, Gujarat and Goa and Andhra Pradesh are monitored by this office. The Regional Office in Patna was established in 1985-86. It covers North and North Eastern Regions. The third Regional Office was established in 1995 at Chennai, Tamil Nadu. The organisation chart of the Board is given in Appendix XVII.

The Board has set up eight state centres for the effective implementation and close monitoring of the schemes. The state centres are located at: (i) Coimbatore in Tamil Nadu, (ii) Hyderabad in Andhra Pradesh, (iii) Bhubaneswar in Orissa, (iv) Calcutta in West Bengal, (v) Agartala in Tripura, (vi) Kondagaon in Madhya Pradesh, (vii) Guwahati in Assam and (viii) Port Blair in Andaman and Nicobar Islands.

While the state centres located in Assam, Tripura, Madhya Pradesh, Orissa and West Bengal are under the administrative control of the Regional Office, Patna, the state centre at Hyderabad is under the Regional Office,

Bangalore and that at Coimbatore and Port Blair are under the Regional Office, Chennai.

The state centres look after the implementation of the Board's schemes in the respective states. They also closely monitor the Board's schemes implemented by the state governments and keep close liaison with the State Agricultural/Horticultural departments.

Apart from the Regional Office and state centres, eight Demonstration cum Seed Production Farms (DSP) have also been established by the Board in different parts of India with the objective of producing quality planting material and demonstrating the scientific cultivation of coconut to the farmers. They are located at: (i) Mandya (Karnataka), (ii) Madhepura (Bihar), (iii) Kondagaon (Madhya Pradesh), (iv) Abhayapuri (Assam), (v) Belbari (Tripura), (vi) Neriamangalam (Kerala), (vii) Vellanikara (Kerala) and (viii) Vegiwada (Andhra Pradesh). These farms, besides serving as sources of quality planting material, act as demonstration and training centres.

A prestigious multi-storied office complex built in the heart of the Kochi city in Kerala now houses the Head Quarters of the Board. The present staff strength of the Board is 289. Of this the strength of the Head Office is nearly 100. The others are manning the Regional Offices, State Centres and DSP Farms situated in various regions.

Thus, from the forgoing pages it is clear that the C.D.B. is rendering yeoman service to the coconut sector.

Nevertheless, the study revealed that most cultivators in Kerala have not yet understood the importance of or even the existence of the C.D.B. Most cultivators still depend on Krishi Bhavans to meet their agricultural requirements except that a low percentage of cultivators from the study area of Ernakulam district have some awareness about the functioning of the C.D.B.

If the basic objectives of this organisation is to be fulfilled, its role should be enhanced further so as to reach each and every coconut cultivator in Kerala, irrespective of their size of holdings.

The next chapter is allotted for a brief account of the findings conclusions and suggestions.

CHAPTER 7

SUMMARY, FINDINGS, CONCLUSION AND SUGGESTIONS

Having analysed the various problems relating to the coconut industry on the basis of the set objectives, the present chapter covers a summary of the findings and making conclusions on the basis of the findings. It also attempts to make a few suggestions for the all-round improvement of the coconut industry in Kerala.

The study was undertaken with the major objective of analysing the coconut marketing problems at farm level. It also aimed at examining the production pattern, consumption pattern and trade in the crop.

Some of the related literatures were reviewed. A study period of 10 years from 1992-93 to 2001-02 was selected for the study. Required information was collected from both secondary and primary sources. The collected data was analysed using statistical as well as mathematical tools.

FINDINGS

In Kerala, the area and production under coconut showed a more or less increasing trend over the years. But in productivity, Kerala is far behind all other producing states. The per hectare productivity of coconut in Kerala showed a steadily declining trend.

Among the districts of Kerala, Kozhikode district has more area under coconut production. Malappuram and Kannur are in the second and third positions respectively.

On the consumption front, coconut oil continues to be the important product of coconut consumed by the Keralites.

Most people prefer coconut oil as the main edible oil. Taste is the main factor that induce them to stick to coconut oil.

Most people in Kerala believed the propaganda against coconut oil that it contained harmful cholesterol. Urban consumers believed it more than rural consumers. But the abstention period was low among urban people. That means most of them shifted back to coconut oil immediately after the abstention.

Buying edible oils in packs is preferred by urban consumers whereas buying in loose measure is preferred by rural consumers.

Female consumers, especially those from rural areas, have a strong sentiment towards using coconut oil for toiletry purpose and also as hair oil. Such sentiment is too strong among unemployed housewives.

Palm oil is found to be the immediate substitute for coconut oil for edible use. This is more so among the lower income groups. But among the

higher income groups sunflower oil and groundnut oil are found to be important substitutes for coconut oil.

About 37 percent of consumers prefer tender coconut water as a thirst quenching drink. Artificial carbonated beverages are preferred by only a small percentage of urban youngsters.

As far as the awareness of consumers about new diversified products of coconut is concerned, among the kernel based products, desiccated coconut is the only product about which consumers know. On an average 45.33 percent answered 'know' while only 4.33 per cent answered 'very well know'.

Among the coconut water based products preserved tender coconut water is the only product about which consumers know. On an average 43.83 percent answered 'know' while only 4 percent answered 'very well know'.

Among the shell based products activated carbon is the only product about which the consumers know. On an average 41.67 per cent answered know 'while only 9 percent answered 'very well know'.

Among the husk based products, coir pith is the only product about which consumers know. On an average 20.33 per cent answered 'know' while only 1.17 per cent answered 'very well know'.

Thus, it could be found that the awareness of consumers about new diversified products from coconut is very low.

On the trade front, India's total export of all coconut products put together comes to just 0.17 per cent of her total exports. Even though several new products from coconut are internationally traded, coconut products exported from India constitute traditional items like copra, coconut oil, copra meal coir products and to some extent desiccated coconut.

The price of coconut and copra is determined based on the price of coconut oil. Nearly half of the total copra produced in Kerala is sent to other states in the form of copra as such. Therefore, the Keralities have no say in determining the demand and price of coconut. It is often determined by the traders in the markets outside Kerala who are big oligopolies.

The high price and the erratic price behaviour of coconut oil coupled with the availability of low priced substitute oils have been responsible for the reduced use of coconut oil in soap manufacturing.

However, since people in Kerala still prefer coconut oil as the main edible oil, there are more than 80 brands of packed coconut oil available in the market now.

In the coir sector, about 30 percent of the annual production of coconut husk in India, is put to industrial use. Kerala accounts for more than 90 per cent of the coir products exported from the country annually which earns foreign exchange to the tune of Rs.300 crores per annum.

It was also found that the market share of tender coconuts to total sales of different thirst-quenching drink comes to about 25 per cent. The study also showed that the entry of traders into the field of tender coconut was considerable during the last five year period. Most of the traders opined that middle-aged people are the main consumers of tender coconuts.

Regarding the problems of marketing, it was found that for the marginal and small holders coconut cultivation do not offer full sustenance and therefore cannot be depended upon as the main source of income. The erratic price behaviour of coconut makes their future bleak.

About 62 percent of cultivators, mostly belonging to marginal and small category, dispose their produce immediately on harvest itself without resorting to any sort of value addition. Financial stringency is the main reason reported by them for selling away their coconuts immediately on harvest.

Only big holders go for value addition either by making copra or coconut oil, their percentage comes to 38 per cent.

On an average only 26.58 per cent of cultivators have a permanent storehouse to store their coconuts for future.

Those who make copra, dry the copra by the conventional sun drying method. Only very few cultivators use modern copra dryer (13.79 per cent)

Non availability of coconut tree climbing labour is yet another problem faced by coconut cultivators in Kerala, especially marginal and small holders. On an average 62.5 per cent of cultivators reported that they some times face the problem. 22.08 per cent of them reported that they always face the problem.

Though most cultivators know about the climbing machine, they do not use it permanently in their coconut gardens. Majority of cultivators reported that the climbing machine is difficult to operate. Thus, adoption level of new technology is very low among cultivators.

About 62 percent of cultivators do not offer their coconut palms for toddy tapping. Psychological resistance is the main reason reported by them for not offering for tapping. A good percentage of cultivators also reported that their coconut palms are not suitable for tapping. At the same time, those cultivators who offer coconut palms of tapping reported a yield increase upto 25 percent from the farm.

The above sentiments (as in the case of toddy tapping) was also visible in the matter of tender coconut harvest. On an average 88.75 per cent of cultivators reported that they never harvest tender nuts. Only 24.36 per cent of big holders reported that they sometimes harvest. Most cultivators reported that their coconut palms are not suitable for tender nut harvest. Some of the

cultivators are afraid that the yield from the garden will decline if tender nuts are harvested.

Effort of increase on-farm income through I.F.S. is very low. If at all some cultivators practice I.F.S., their percentage is higher in the central region of the state which could be due to the impact of the role played by the C.D.B. in propagating the benefits of I.F.S.

Yield loss due to diseases is yet another problem faced by the cultivators. About 45 per cent of them reported that their garden is affected by Mandari by 40-50 percent.

As for institutional support, most cultivators see the C.D.B. as an institution providing support and assistance for cultivation activities only, eventhough it assists in processing and marketing too. Only some cultivators in the study area of Ernakulam district have a different opinion that the C.D.B. assists in all these matters. Most cultivators still approach Krishi Bavan for their agricultural requirements.

82.5 percent of cultivators reported that they do not enjoy the benefit of M.S.P. declared by the government under the P.S.S. This is because by the time the government declares the M.S.P. almost all the coconut cultivators might have sold away their coconuts to dealers who are the actual processors of copra. Thus, it is these dealers who ultimately reap the benefits of M.S.P. rather than the cultivators themselves.

For getting agricultural loan the marginal and small category of cultivators mainly depend on private local money tenders who are also dealers of coconuts. Some cultivators on account of their financial stringency collect the price of their produce in advance from the dealers. In this way, they are permanently indebted to these dealers who usually give a price only lower than the market price.

But big holders usually approach commercial banks for loan.

Co-operative marketing has not been developed among coconut cultivators. On an average only 4.53 per cent of them sell their produce through co-operatives.

SUGGESTIONS FOR IMPROVEMENT

Coconut in Kerala is in the hands of small and marginal farmers. It is basically a homestead crop having profound influence on the socio-economic security of 2.5 million farm-households. The average size of holding devoted to coconut farming is as small as 0.25 ha and over 90 per cent of the holdings accounting for 60 per cent of the total area under the crop are in the category of marginal holdings not capable of generating adequate income for the dependent households.

Among the major coconut growing states in India, Kerala enjoys the pride of place both in the area under and production of coconut. However,

over the last four decades, the importance of the state has been consistently on the wane. The contribution of Kerala which was 69.4 per cent of the total production in the country in 1960-61 came down to 46.7 per cent in 1990-91 and to 42.17 per cent in 1999-2000. This shows that coconut production has been increasing in other states at much faster rates than in Kerala . There has also been a corresponding change in the utilisation of coconut in the country. The situation in Tamil Nadu is a good example. Over the period since 1991-92 this state has emerged as a major producer of milling copra by increasing the share to over 38 percent from just 5.6 per cent of the total out put in the country. As a result, the share of Kerala in milling copra production has plummeted to 56 per cent from 90 per cent.

Kerala has not made tangible progress in product diversification and by-product utilisation in coconut industry except for the traditional activities such as oil milling and coir processing. As a result, coconut oil continues to be the only major commercial product having influence on the farm level price of coconut. Coconut oil which was once considered to be indispensable in certain end uses, has over the last 2-3 decades lost its predominance and is presently exchangeable with other oils and fats at will, price being the determinant factor. Coconut oil prices continue to rule low as a result of the increasing competition from low priced oils such as imported palm oil and palm kernel oil from abroad. Such a situation will erode the domestic demand for coconut oil unless its price is on par with that of the competing oils. The

downward pressure on the price of domestic coconut oil is causing a destabilizing effect on the household economy of the coconut farmers in the state.

The coconut based economy of Kerala can expect a revival from the negative impact of liberalised imports only when the profitability of coconut farming is de- linked from the price behaviour of coconut oil. This is possible to be achieved through efficient utilisation of the land under coconut and also the products at the on-farm and community levels. As coconut farming has close linkage with other aspects of rural life, it is not to be treated in isolation but only as a component of integrated rural development. The strategy for coconut development must, therefore, be multi-faceted and at the same time people centred with farm households forming the target group. The primary objectives of such a strategy shall be:

1. To create opportunities for enhanced on-farm income and employment.

2. To promote efficient product and by-product utilisation both at the on-farm and community levels.

3. To strengthen marketing infrastructure for domestic and export marketing and

4. To direct research on varietal improvements for higher output of primary products from coconut and technology development.

Enhanced on-farm income and employments

As the average size of coconut holding in Kerala is only 0.25 ha, mono-cropping models when practised will not support the livelihood security of the dependent families. In the context of the declining on-farm income caused mainly by the liberalised imports of vegetable oils it is important to restructure the small holdings into economically viable operational units by promoting intensive integrated farming. The farming system involving diverse cropping models and enterprises such as dairying, poultry rearing, pisciculture etc depending on the edaphic and climate conditions will ensure multiple sources of income, nutritious food of plant and animal origin and additional on-farm employment.

Integrated Farming System (I.F.S) seems to be the possible solution for higher coconut production, stability of income and socio-economic improvement of small scale framers with limited resources. I.F.S has a bright future owing to a good market for the outputs. This also will provide ways to recycle produces and waste materials of one component as input through another linked component and reduce the cost of production of the products which will finally raise the total income of the farm. Further, this also will bring improvement in soil health through recycling of organic wastes thereby increasing the overall productivity of the farm.

The adoption of IFS is essential as coconut production is subjected to a high degree of risk and provides only seasonal, irregular and uncertain income and employment to the farmers. With a view to mitigate these risks and uncertainties I.F.S should be practised for higher production and better standard of living. It will also create opportunities for gainful employment to the women members of the participating households and facilitate efficient resource conservation.

Potential districts are to be identified and the farmers provided with technical and institutional support for dispensing integrated farming units. In each district the participating farmers should be encouraged to organize themselves into self-help groups or co-operatives for the purpose of availing technical support, procuring inputs and processing and marketing of surplus farm output. The proposed integrated farming units linked to farmers' organisations can trigger a process of change in the farming sector of the state leading to rural prosperity and sustained growth in the agricultural economy. It is, however, important that the farmers receive effective extension education on resource conservations, appropriate cropping models, nutrient management, integrated pest and disease control and product utilisation for achieving lasting progress in the desired direction.

I.F.S. should aim at achieving optimum productivity on an enduring basis by stimulating the underlying productivity of the soil. Prevention of soil

loss is one of the more essential pre-requisites for sustaining optimum levels of production. Integration of miscellaneous woody species on coconut holding, use of biological barriers and mechanical devices against rapid surface flow of water, conservation tillage and adoption of appropriate agronomic practices to activate soil life are effective measures that should be propagated among the farmers. The conservation of locally available organic wastes should be promoted as a community activity at the village, block and district, levels in order to generate substantial amount of organic sources of nutrients and to improve the quality of local environment by preventing pollution of soil and water bodies.

The promotion of I.F.S. in coconut holdings with emphasis on resource conservation holds promise for the growth of the agricultural economy of the state by generating marketable surplus of organically grown foods which enjoy considerable consumer demand in many states in the country as well as in other countries. Global demand for good products devoid of chemical contaminants is steadily on the increase. This trend could be taken advantage of by devoting special attention to the organisations of organically maintained coconut gardens.

It would be necessary to create institutional set up for labelling and certification of organically grown coconut and other farm produces like spices, fruits, vegetables etc derived from the farming system.

Efficient product and by-product utilisation

Kerala has not achieved noticeable progress in the utilisation of the multiple products of coconut palm for value addition both at the farm-household and community levels. This has happened mainly because of the low priority assigned to technological research in the national and state level research establishments. As compared to the tardy growth recorded by the state in the processing sector, most of the coconut growing countries in the world are profiting from the production and export of diverse coconut products. For instance Philippines export over 40 non-traditional products of which coco chemicals, coconut milk products, coconut water based products and shell and coir products are of importance. From Sri Lanka, shell based products fresh coconut, coir products, double distilled arrack and even leaf mid-ribs are being exported. Small Island countries like Samoa are already major exporters of coconut milk based products. Fiji has started producing and exporting coconut cheese. Dominican Republic has set up a commercial plant for the processing and bottling of tender coconut water into a health drink and the jelly like kernel into jam and other confections. Likewise, coconut sugar is one of the export items form Indonesia and Thailand. Although possibilities are wide, it is prudent for Kerala to concentrate on selected products which could compete price-wise and quality-wise both in the domestic and export markets.

Marketing of Tender Coconut

Consumer preference around the world is changing in favour of natural health foods and beverages. Tender coconut is gaining acceptance in the developed, countries as a natural source of nutritious food and beverage. The consumer demand for this natural drink is now on the increase particularly in the context of the propaganda and awareness against artificial carbonated beverages like cola. This opportunity is being made use of by some countries for export. Already Malaysia, Thailand and Sri Lanka have stated exporting tender coconut and for which special varieties have been identified and their cultivation promoted. The yellow and orange coloured nuts of Malayan Dwarf variety, Aromatic coconut of Thailand and King coconut of Sri Lanka are the types presently exported. The Orange Dwarf variety of Kerala is comparable to those types in sugar content, flavour and nutritional features. The potential has not been made use of by the state neither for export nor for sales within the country.

In Kerala there is immense scope for utilizing a major share of coconut production at the tender stage itself and thereby eliminating a sizable portion of the mature nuts for conversion as copra.

Appropriate technologies have been developed by the exporting countries for retaining the flavour and fresh appearance to tender coconut for a long period. Under normal conditions the freshness of tender coconut will

be lost after 3-4 days. In order to meet the export demand the taste of nut water and external appearance of the fresh nut have to be maintained for a minimum period of 3-4 weeks.

Export possibilities of tender coconut could be explored by Kerala for the nuts of Orange Dwarf variety. Demand for fresh tender coconut is also high in many states within the country. Along with developing appropriate marketing strategies, the farmers are also to be induced to cultivate Orange Dwarf palms in order to create adequate supply sources for tender coconut. In short, marketing of tender coconut will create opportunities for enhancing on-farm income of farmers and employment at different levels.

Marketing of Coconut sugar and Toddy

Coconut sugar made from unfermented inflorescence sap is a health food. It is a preferred commodity by health conscious people and its demand as a natural health good is consistently on the increase in both the developing and developed countries. The production and marketing of coconut sugar constitute an organised activity in countries like Thailand and Indonesia.

Sugar production from coconut palms is labour intensive requiring not much of capital investment. When organised as a rural activity under the aegis of coconut farmer's co-operatives, it could generate additional income and employment to a sizable section of rural community in the state.

Along with sugar production, introduction of canned fresh toddy for domestic and export marketing will prove to be a viable activity. Like palm sugar, unfermented sweet toddy could be marketed as a health drink. Techniques for preventing spontaneous fermentation of fresh coconut sap are now available. Similarly, technologies for the canning of fresh toddy are available which are only to be pilot tested for adopting the most appropriate one, under local situations. The farmer's co-operatives which organise toddy tapping and sugar production or even individual entrepreneurs may be permitted to undertake the activity under proper control.

In Kerala income from coconut holdings will register a sharp increase with the direct involvement of registered farmer's organisations in toddy tapping and the subsequent processing of sweet toddy. Apart from the production and marketing of different forms of sugar, these organisations could also serve as the supply source of toddy to the local toddy parlours. Registered farmers' societies may also be permitted to dispense licensed toddy parlours in their respective operational areas. The membership of these societies should comprise both coconut farmers and tapers. For facilitating the toddy based processing, adequate availability of toddy is essential. This could be ensured by granting the societies the right to tap by making amendments in the present Abkari Laws etc. (According to the Abkari Law enacted in 1902, coconut growers are banned from making coconut based products like sweet toddy and jaggery from coconut trees on their holdings).

At a time when the price of coconut has crashed, the growers would benefit if they are allowed to make coconut-based product to supplement their income.

Coconut based food processing through Women's groups

Women's groups engaged in coconut based food processing are active in countries like Vietnam, Thailand and Philippines. These groups produce diverse convenience foods from coconut and market them through different channels both in the domestic and external markets. Common among the products are coconut kernel based confections, kernel, chips, coconut cheese, coconut milk based sweetened concentrates, coconut water based nata-de-coco, vinegar etc. The progress in this direction is sluggish in Kerala.

Registered women groups are to be organised in Kerala for food processing in the coconut sector. Both technical and marketing support are essential to sustain their activities. Training facilities presently available with organisations like Coconut Development Board should be kept open for the benefit of the members of the groups. Similarly, marketing support has to be extended in the form of market promotion for selected value added products. The processing could be organised both at the on-farm and community levels. In the Philippines, nata-de-coco is encouraged to be produced in households for subsequent procurement and marketing by specialised agencies. For

domestic marketing the product is processed further into different preparations.

The women's groups in Kerala that are to be involved in food processing can organise the production at common locations as well as at individual households depending on the nature of the product. The products that are amenable for production at household level are nata-de-coco, Vinegar, Kernel based confections etc. These products are to be pooled and labelled by the group concerned for final marketing. At the common location facilities are to be developed for the processing of diverse products such as kernel chips, cheese, milk-based sweetened concentrates etc. Through these activities the women members of the groups can find gainful employment at the local levels. The farmers will also be benefited through increased demand for coconut.

Project facilitation in selected processing areas:

The importance of Kerala as the major coconut producing state in India is confined to the production of nuts and not in processing them for value addition. The lack of investment opportunities as well as poor entrepreneurial response to modern advances in coconut processing have been instrumental for the lack-lustre performance of the sector. Facilities for developing appropriate processing technologies and for encouraging prospective

entrepreneurs to make investments with confidence are yet to be created in the state.

The coconut products which show potential for organised production in the state are desiccated coconut, partially defatted coconut flour and coconut water and milk based products. The availability of good quality desiccated coconut produced by adopting modern processing technologies and supported by purposeful market promotion will expand the demand for the product both in the coconut producing and non-producing states. The product has also export opportunities.

The production of partially defatted coconut flour and special grade coconut oil also offer commercial possibility. Partially defatted coconut flour has longer shelf life and better functional properties than desiccated coconut. The product will find acceptance in the organised food industry because of its favourable qualities and the possibility of making it available at a price less than that of desiccated coconut.

The coconut oil derived from the process of partial defatting will be of high quality particularly with respect to moisture and free fatty acid contents. It is highly suitable for direct edible uses and for cosmetic applications.

Among other kernel based products, dehydrated kernel chips, preserved form of finely ground wet kernel paste and skim milk products show potential for commercial scale production and marketing. These has

already evoked consumer interest in the international markets and the opportunity could be exploited profitably by Kerala.

Coconut based handicrafts

Attractive coconut based artefacts are now available in the markets of many countries, particularly Vietnam, Thailand, Indonesia Sri Lanka and Philippines. These products find acceptance not only in the markets of the respective countries but in the international markets also and constitute one of the major sources of export earnings. The coconut products made use of by skilled artisans are wood, shell, fiber and spathe and some of the artefacts are valued for their aesthetic quality and also for their utility as household appliances.

In Kerala many rural artisans are engaged in handicrafts for their livelihood. These activities are mostly confined to households barring a few large units. There are many small scale handicraft units in the state managed entirely by women. Although manufacture of coconut based handicraft has been in existence as a traditional activity in the state, its development into a viable and flourishing enterprise has been inhibited because of the absence of facilities for design and training and also organised marketing. New designs in accordance with changing consumer preference and training in the production of modern artefacts are essential pre-requisites for competing with

quality products emanating from other countries. Equally important is the opportunity for marketing the products in the domestic and export markets.

Strengthen Marketing Infrastructure

Marketing support is essential for the traditional and non-traditional coconut products emanating from the state. Apart from those products which can find domestic markets, there are some which could be successfully introduced in the export markets. Coconut sugar, tender coconut, coconut skim milk and water based products, coconut kernel based convenience foods etc have potential to attract consumers both within and abroad on quality consideration.

As most of these products are amenable to be procured at the household level, community based organisations are essential for procuring, screening for quality, packaging, labelling and marketing. Organised producers would need different forms of support for domestic as well as export marketing.

The marketing support should cover Evaluation and promotion of New coconut based Enterprises, Market information and consultancy, Market Research and surveys and Market promotion.

Research on varietal improvement

Research support is needed in two specific areas. One is in crop improvement for evolving and popularising coconut varieties that will yield nuts with a higher out-turn of processed products. The other is in technology development for the efficient utilisation of coconut and its products.

CONCLUSION

India is a signatory to W.T.O. agreement which shall call for liberalised E.X.I.M. policy where the barriers of trade are to be removed. It would not be possible to stop the coconut import and it will have negative impact on coconut industry in the country if the production cost is not reduced to make it competitive as international price of coconut and coconut products is much less. Thus, product diversification, adoption of stringent quality standards for coconut products and increased productivity are some of the ways to make this industry competitive.

It is pertinent to mention that there is bright future for coconut in India provided we prepare our self to meet the challenges. Available infrastructure, trained man-power and wide range of climatic conditions available in the country are indicative of best capabilities. At the same time, these resources have to be effectively utilised to harness the best for making coconut industry more competitive and dynamic.

There is ample scope for further research studies, particularly in areas like role of co-operatives in new coconut product development and marketing, extent and problems associated with women labourers in engaged in the coconut industry, problems relating to technology upgradation and adoption level in coconut sector and so on.

APPENDIX I

INTERVIEW SCHEDULE

CULTIVATOR SURVEY

1. Information about size of holding

1.1. Area of your coconut garden? (✓)

A. Below 1-hectare (Marginal)
B. Between 1 and 2 hectares (Small)
C. Above 2 hectares (Big)

1.2 Is Agriculture your prime profession? (✓)

A. Yes
B. No

1.3: If 'No' other jobs? (✓)

A. Govt. service
B. Pvt. service
C. Business
D. Job Abroad
E. Retired
F. other……..(specify)

2. Information about storing habit (holding capacity)

2.1: Do you dispose of your coconuts immediately on harvest (✓)

A. Yes
B. No

2.2: If yes (ie A) show reason for disposing immediately? (✓)

A. Financial stringency
B Absence of storing facility
C. Indebtedness to the buyer

2.3: If your answer for 2.1 is 'No' (ie B), what do you do the coconuts (✓)

A. Store for future
B. All coconuts are used for household use.

2.4: If your answer for the above is 'store for future (ie A), where do you store? (✓)

A. Fully in store house
B. Fully on farm ground
C. Partly in store house and partly on the ground

2.5: If you store how long do you store? (✓)

A. Upto 3 months
B. Between 3 and 6 months
C. Between 6 months and 1-year
D. Above 1 year

2.6: After storing what do you do the coconuts (✓)

A. Sell when need for money arises
B. Process copra and sell copra
C. Process copra, make coconut oil and then sell oil.

2.7: Do you get benefit due to storing? (✓)

A. Always
B. Sometimes
C. Never

3. Information about Insurance habit

3.1: Do you insure your produce? (✓)

A. Always
B. Sometimes
C. Never

4. Information about problem of harvesting

4.1: How do you pay the tree-climbing labour ? (✓)

A. In kind (coconut)
B. In cash (Rupees)
C. Both

4.2: Do you experience any problem in getting labour for tree-climbing?(✓)

A. Always
B. Sometimes
C. Never

4.3: Do you know 'climbing machine'? (✓)

A. Yes
B. No

4.4: If 'yes' (ie A) do you use it in your garden? (✓)

A. Always
B. Sometimes
C. Never

4.5: If 'you 'use' (ie if your answer for 4.4 is A or B), state the reason for using? (✓)

A. Saving in labour cost
B. Harvest at right time possible
C. Farmer himself can use it.

4.6: If you 'Never use (ie if answer for 4.4 is 'C'), State the reason for not using (✓)

A. Psychological resistence
B. Difficult to operate
C. Time consuming
D. High cost

5. Information about copra making : (value addition)

5.1: Do you make copra? (✓)

A. Yes
B. No

5.2: If you make (ie A), which method do you adopt to dry copra? (✓)

A. Dry in sunlight
B. Dry both in sunlight and using country smoke dryer
C. Dry using Modern dryer
D. Dry in sunlight as well as using Modern dryer

5.3: If you dry in sunlight where do you dry? (✓) (ie A, B,D)

A. In special drying yard
B. In the court yard of the house
C. On the terrace of the house
D. On the roadside.

5.4: If you have a special drying yard (ie A) show the area of it? (✓) sq.ft.

A. Below 500
B. 501 - 1000
C. 1001 and above.

5.5: If you use Modern dryer (ie if answer for 5-2 is C or D), show reason for using it (✓)

A. Moisture level can be reduced quickly to the maximum
B. No need to depend on sunlight
C. Labour cost can be reduced
D. Superior quality copra obtained.

5.6: If you do not use Modern dryer (ie if your answer for 5-2 is A or B), show reason for not using? (✓)

A. Do not know about it
B. Psychological resistance
C. High cost, installation not affordable

5.7: If you make coconut oil (ie if your answer for 2.6 is 'C'), do you own a Mill? (✓)

A. Yes
B. No

5.8: If yes (ie A) which is the type ? (✓)

A. Expeller
B. Rotary
C. Country chekku

6. Information about presence of Intermediaries (Problem of selling)

6.1: To whom do you sell your produce? (✓) (need answer if your answer for 2.1 is 'A' and for 2.6 is A,B,C and D)

A. To the local village dealer
B. To the dealer in the town
C. To the big dealer in the city
D. To the co-operative society.

6.2: Do you get reasonable price? (✓)

A. Always
B. Sometimes
C. Never.

6.3: Do you contact co-operatives to dispose your produce? (✓)

A. Yes
B. No

6.4: If 'No' (ie B) show reason? (✓)

A. Delay in taking decision
B. Mis behaviour on the part of officials
C. Exorbitant charges
D. Complicated formalities
N. No facility in my locality.

7. Information about problem of transportation

7.1: Specify your most important problem of transportation, if any

A. Improper roads
B. Means of transportation not available
C. Abnormal cost of transportation
D. Risk due to harassment by govt. official
E. None.

8. Information about problem of organisation support

8.1: State from where do you get assistance for the following? (✓)

	A C.D.B	B Co-op society	C Dealer	D K.A.U	E CPCRI	F Krishi Bhavan	G Friends
1. Seedlings	☐	☐	☐	☐	☐	☐	☐
2. Manure	☐	☐	☐	☐	☐	☐	☐
3. Pesticides	☐	☐	☐	☐	☐	☐	☐
4. Inter cropping	☐	☐	☐	☐	☐	☐	☐
5. Mixed farming	☐	☐	☐	☐	☐	☐	☐
6. Sprayer	☐	☐	☐	☐	☐	☐	☐
7. Climbing Machine	☐	☐	☐	☐	☐	☐	☐
8. Moisture metre	☐	☐	☐	☐	☐	☐	☐
9. Modern dryer	☐	☐	☐	☐	☐	☐	☐
10. pumpset	☐	☐	☐	☐	☐	☐	☐

8.2: State your perception about C.D.B (✓)

	A Strongly agree	B Some what agree	C Neither agree Nor disagree	D Some what disagree	E Strongly disagree
	2	1	0	-1	-2
1. Helps in cultivation	☐	☐	☐	☐	☐
2. Helps in processing	☐	☐	☐	☐	☐
3. Helps in Marketing	☐	☐	☐	☐	☐

8.3: Is the Minimum support price declared is beneficial to you?

A. Always
B. Sometimes
C. Never.

9. Information about affecting diseases/pests

9.1: How far is your coconut palms affected by the following diseases/pest (in per cent) (✓)

	A Not affected	B 0-10	C 10-20	D 20-30	E 30-40	F 40-50	G 50
1. Mandari	☐	☐	☐	☐	☐	☐	☐
2. Root wilt	☐	☐	☐	☐	☐	☐	☐
3. Thanjavoor wilt	☐	☐	☐	☐	☐	☐	☐
4. Stembleeding	☐	☐	☐	☐	☐	☐	☐
5. Tatipaka	☐	☐	☐	☐	☐	☐	☐
6. Budrot	☐	☐	☐	☐	☐	☐	☐
7. Lethal yellowing	☐	☐	☐	☐	☐	☐	☐

10. Information about by-product utilisation

10.1: How do you usually sell coconuts? (✓)

A. With husk
B. Dehusked

10.2: If answer is 'dehusked' (ie B) what do you do with the husk? (✓)

A. Use as fuel
B. Sell to others for fuel
C. Sell to the coir manufacture
D. Make coir yarn at home and sell it.

10.3: What do you do with the residue parts of the coconut palm? (✓)

	1 Leaf	2 Spathe	3 Peduncle	4 Petiol	5 Midrib	6 Leaf sheath
A. Leave carelessly in the garden	☐	☐	☐	☐	☐	☐
B. Sell to others	☐	☐	☐	☐	☐	☐
C Use us fuel at home	☐	☐	☐	☐	☐	☐
D. Burn in the garden	☐	☐	☐	☐	☐	☐
E. Sell to processing unit	☐	☐	☐	☐	☐	☐

11 Information about toddy tapping

11.1: Do you offer coconut trees for toddy tapping? (✓)

A. Always
B. Sometimes
C. Never

11.2: If you offer (ie if answer for the above is A or B), show the increase/decrease in yield from the garden? (✓) (in per cent)

A: Increase between 0-25
B. Increase between 25-50
C. Increase above 50
D. Static yield
E. Less yield

11.3: If you 'never offer' (ie if answer for 11.1 is 'C'), show reason? (✓)

A. Psychological resistance
B. Fear that yield will decline
C. Fear that lease agreement will not be met by the party
D. Palms are not suitable for tapping

12. Information about harvesting tender coconuts

12.1: Do you harvest tender coconuts for selling? (✓)

A. Always
B. Sometimes
C. Never

12.2: If you harvest (ie if answer for above is 'A' or 'B'), show your increase/decrease in yield from the garden. (✓) (in percent)

A. Increase between 0-25
B. Increase between 25-50
C. Increase above 50
D. Static yield
E. Less yield.

12.3: If you 'Never harvest' (ie if answer for 12.1 is 'C'), show reason? (✓)

A. Psychological resistance
B. Non-availability of labour
C. Problem of finding dealer
D. Fear that yield will decline
E. The present variety of palms are not suitable for tender coconut harvest.

13. Information about Mixed farming/Intercropping

13.1 Which of the following do you practice in your garden? (✓)

A. Inter cropping only
B. Mixed farming only
C. Practice both
D. Practice None.

13.2: If you practice inter cropping only (ie if answer for above is 'A'), show items. (✓ each you have).

A. Arecanut
B. Vegetables
C. Banana
D. Pepper
E. Betal leaf
F. Pineapple
G. Tuber crops
H. Cashew
I. Tapioca
J. Cocoa
K. Coffee
L. Other.....(specify)

13.3: If you practice mixed farming only (ie if answer for 13.1 is 'B'), show item (✓ each you have).

A. Dairying
B. Bee Keeping
C. Sericulture
D. Pisciculture
E. Poultry
F. Pigs.
G. Other.....(specify)

13.4: What is your increase/decrease in yield from the farm after introducing Inter cropping/Mixed farming? (✓) (in percent)

A. 0 - 10
B. 11 - 20
C. 21 - 30
D. 31 - 40
E. 41 - 50
F. Above 50
G. No change in yield
H. Less yield

14. Information about problem of Market information

14.1: Which of the following source you mainly depend upon for market information? (✓)

A. Know directly from the market through occasional visit
B. Ask other farmers
C. Ask the dealer or commission agent in the village
D. Over the Radio
E. Newspapers
F. Television
G. Publications of C.D.B
H. Publications of C.P.C.R.I
I. Publications of K.A.U
J. Publications of co-operatives.

14.2: What is you opinion about the present source? (✓)

A. Very Good
B. Good
C. Bad
D. Very bad
E. Need to improve.

15. Information about problem of finance (Agricultural credit)

15.1: Do you avail loan for coconut cultivation? (✓)

A. Always
B. Sometimes
C. Never

15.2: If you avail (ie if answer for above is 'A' or 'B'), from which source? (✓)

A. Commercial bank
B. Co-operative society
C. Private Money lender
D. Village dealer.

15.3: If you 'Never avail' (ie if answer for 15.1 is 'C'), show reason? (✓)

A. Very high interest rate
B. Uneasy terms of repayment
C. Complicated formalities
D. No facility in my locality.

15.4: If you avail (ie if answer for 5.1 is 'A' or 'B'), how much? (percent of total cost of production)

A. 0 - 25
B. 26 - 50
C. 51 - 75
D. 76 - 100.

15.5: Do you collect the price of coconuts from the buyer even before harvest? (✓)

A. Always
B. Sometimes
C. Never

15.6: If you collect, (ie if answer for above is 'A' or 'B'), how much? (percent of anticipated price)

A. 0 - 25
B. 26 - 50
C. 51 - 75
D. 76 - 100
E. Above 100 (even more than the anticipated price).

APPENDIX II

INTERVIEW SCHEDULE
(CONSUMER SURVEY)

Region.....District.....Taluk.....
Urban/Rural

1. Personal Information:

1.1. Sex: (✓)
A. Male
B. Female

1.2: Age (yrs) (✓)
A: Below: 25
B: 26 - 35
C: 36 - 45
D: 46 - 55
E: Above 55

1.3: Educational Qualification: (✓)
A : Below S.S.L.C
B : S.S.L.C level
C : P.D.C/+ 2 level
D : Degree and above

1.4: Occupation (✓)
A : Employed
B : House wife
C : Business
D : Retired
E : Agriculture
F : Professional
G : Coolie
H : Others.....

1.5: Family income per month (✓):
A : upto 2000
B : 2001-5000
C : 5001 - 10,000
D : Above: 10,000

1.6: Number of family Members (✓)
A : upto 3
B : 4-6
C : 7-9
D : Above 9

2. Information about Consumption of different edible oils:

2.1: Which of the following do you consume as edible oil? (✓)

A : Coconut oil
B : Palm oil
C : Sunflower oil
D : Ground nut oil
E : Mustard oil
F : Soyabean oil
G : Gingelly oil
H : Other.....

2.2: Of the above which one do you consume more? (✓)

A : Coconut oil
B : Palm oil
C : Sunflower oil
D : Groundnut oil
E : Mustard oil
F : Soyabean oil
G : Gingelly oil
H : Other.....

2.3: In your opinion which one is the costliest (✓)

A : Coconut oil
B : Palm oil
C Sunflower oil
D : Ground nut oil
E : Mustard oil
F : Soyabean oil
G : Gingelly oil
H : Other.....

3. Information about awareness of packed/Branded edible oils:

3.1: In buying edible oils which one do you prefer: (✓)

A : Buying in Consumer packs.
B : Buying loose measure.
C : No such preferences.

3.2: If you prefer buying in consumer packs (ie A), the most appropriate reason? (✓)

A : Easy handling and transporting
B : Easy storage
C : Accurate label mentioned quantity
D : Purity
E : Reusability of empty container
F : Loose measure not available in my area
G : other.....

3.3: If you prefer buying in loose measure, (If answer for 3.1 is B), the most appropriate reason? (✓)

A : Cost factor (less price)
B : Taste factor (original taste)
C : Quality factor (original quality)
D : Quantity factor (Convenient quantity). buying possible
E : Packed oil not available in my area.
F : other...

4. Information about preference of coconut oil

If you use coconut oil please answer the following questions:

4.1: Hose long you have been using coconut oil? (✓)

A : Less than 5 yrs.
B : 6 - 10 yrs.
C : 11 - 20 yrs.
D : 21 - 30 yrs.
E : Above 30 yrs.
F : Do not use coconut oil

4.2: Do you prefer coconut oil? (✓)

A : Yes
B : No.

4.3: If 'Yes' ie (A), the reason? (✓)

A : Taste
B : Purity
C : Health factor
D : Smell
E : Quality
F : Other.....

4.4: Who initiate you to purchase coconut oil (✓)

A : Family custom
B : Doctor's advice
C : Advertisement
D : Friends
E : Relative
F : Reference group
G : Other.....

4.5: Your opinion about price of coconut oil? (✓)

A : Comparatively high
B : Comparatively equal
C : Comparatively low.

5. Information about substitution habit

5.1: If you use coconut oil, were you aware of the propaganda that coconut oil has high cholesterol? (✓)

A : Yes
B : No

5.2: If yes (ie A) did you believe so?

A : Yes
B : No

5.3: If yes (ie A) did you reduce coconut oil consumption then? (✓)

A : Yes
B : No

5.4: If yes (ie A) to which edible oil did you immediately shift? (✓)

A : Palm oil
B : Sunflower oil
C : Groundnut oil
D : Mustard oil
E : Gingelly oil
F : Soyabean oil
G : Other....

5.5: How much did you reduce coconut oil consumption? (in percent) (✓)

A : upto 25 per cent
B : 26 - 50 "
C : 51 - 75 "
D : 76 - 100 "

5.6: How long did you continue to avoid coconut oil? (✓)

A : Below 1 year
B : 1 - 5 yrs.
C : 6 10 yrs.
D : Above 10 yrs.

5.7: Did you shift back to coconut oil later? (✓)

A : Fully shifted
B : Partly shifted
C : Never shifted

6. Information about Brand awareness

6.1: Which of the following brands do you usually buy? (✓) (Need answer only if you buy coconut oil in packs)

A : Kera
B : Other brands

6.2: Is your brand readily available in the market? (✓)

A : Always available
B : Sometimes available
C : Not at all available.

6.3: Your opinion about 'taste' of branded coconut oil: (✓)

A : Best
B : Comparatively good
C : Not bad
D : Excellent
E : Good

6.4: Your opinion about 'smell' of branded coconut oil: (✓)

A : Best
B : Comparatively good
C : Not bad
D : Excellent
E : Good

6.5: Your opinion about 'purity' of branded coconut oil: (✓)

A : Best
B : Comparatively good
C : Not bad
D : Excellent
E : Good

7. Information about Media awareness

7.1: Your opinion about the advertisement of coconut oil expressed in different media: ✓)

A : Needful
B : With minimum about the oil
C : Not good
D : Need to improve
E : No idea

7.2: Which media is effective and attractive in your opinion, as regards coconut oil advertisement? (✓) (Need not answer if your answer for above is 'E')

A : Journals
B : Newspaper
C : Radio
D : Television
E : Films/Movies
F : Other.....

8. Information about use of coconut oil for toiletry purpose

8.1: Do you use coconut oil for toiletry purpose? (✓)

A : Always
B : Occasionally use
C : Never use

8.2: If you use 'always' (ie 'A') or occasionally (ie B), show reason? (✓)

A : Traditional belief that it is good for skin and health
B : Own experience that it is good for skin and health
C : Good fragrance
D : Doctor's advice
E : Other ....

9. Information about use of coconut oil as hair oil

9.1: Do you use hair oil? (✓)

A : Always use
B : Occasionally use
C : Never use

9.2: If you use 'Always' (ie A) or ocassionally (ie B), which of the following you use? (✓)

A : Perfumed hair oil
B : Coconut oil
C : Gingelly oil
D : Other.....

9.3: If you use coconut oil as hair oil, show reason (✓)

A : Traditional belief that it is good for the hair
B : Own experience that it is good for the hair
C : Good fragrance
D : Doctor's advice
E : Other...

9.4: If you use perfumed hair oil which type do you prefer? (✓)

A : Hair oil containing single or mixture of vegetable oils like coconut oil
B : Hair oil containing only liquid paraffins
C : Hair oil containing mixture of vegetable oils and liquid paraffins
D : No such botherations; use any type.

10. Information about consumption of Tender coconut

10.1: For quenching thirst which of the following do you prefer? (✓)

A : Artificial carbonated beverages like cola
B : Completely natural beverage like tender coconut water
C : None of the above

10.2: If your answer for the above is 'B' do you always use it? (✓)

A : Always use
B : Occasionally use

10.3: If your answer is 'B' ie 'occasionally use', show reason (✓)

A : High price
B : Not available every where

10.4: You like tender nut drinking in (✓):

A : Natural form
B : Preserved/tinned form
C : Like both

10.5: Which nut color do you prefer? (Need answer if your answer for above is A or C)

A : Green
B : Orange
C : Yellow
D : No color preference

11. Information about readiness to use our own coconut products

11.1: If coconut oil is imported from other countries and made available at lower prices, will you buy? (✓)

A : Yes
B : No
C : Depends on taste and smell

11.2: If your answer is 'No' (ie B), the most appropriate reason (✓)

A : Belief that our coconut oil is far better in taste and smell
B : Tradition/sentiments to stick to our own products
C : Desire that our coconut industry should develop

11.3: Will you use tender coconut water, if made available in preserved/ tinned form at reasonable price? (✓)

A : Yes
B : No
C : Depends on taste

12: Information about awareness of diversified products of coconut

(About how many of the following products of coconut you are aware?) (√)

	12.1: Kernel based products	A Know	B Very well know	C Do not know
1.	Desiccated coconut Coconut cream	☐	☐	☐
2.	Coconut Cream	☐	☐	☐
3.	Coconut Lessy	☐	☐	☐
4.	Coconut snow ball	☐	☐	☐
5.	Chutney (Ready-to-serve)	☐	☐	☐
6.	Coconut Milk powder	☐	☐	☐
	12.2: Coconut water based products			
1.	Preserved/tinned: Tender coconut water	☐	☐	☐
2.	Coconut water vinegar	☐	☐	☐
3.	Coco sauce	☐	☐	☐
4.	Coco honey	☐	☐	☐
5.	Nata-de-coco	☐	☐	☐
6.	Biogas from coconut water	☐	☐	☐
7.	Electricity from coconut water	☐	☐	☐
	12.3: Coconut Shell based products			
1.	Shell powder	☐	☐	☐
2.	Activated carbon	☐	☐	☐
3.	Shell oil	☐	☐	☐
	12.4: Coconut husk based products			
1.	Coir pith	☐	☐	☐
2.	Coir geotextiles	☐	☐	☐
3.	Coir fibre wood Cement Board (C.W.C.B)	☐	☐	☐

APPENDIX III

INTERVIEW SCHEDULE

DEALER SURVEY

Region.....District.....

Category of dealer (✓) : Elaneer Pandal/Cool bar/ Hawker on Highway

1. Experience

1.1: How long you have been doing tender coconut business? (✓)

A. Below 5 years
B. 6 - 10 years
C. 11 - 15 years
D. 16 - 20 years.

2. Source of Supply

2.1: From where do you buy tender coconuts (Source of supply) (√)

A. From the farms in Kerala
B. From the farms outside Kerala
C. Other....

3. Category of users

3.1. In your opinion which category of people are more interested in consuming tender coconut? (✓)

A. Children
B. Youngsters
C. Middle-aged
D. Aged.

4. Adoption of modern device

4.1. For cutting tender nuts which method do you adopt? (✓)

A. Cut with a sharp knife
B. Cut using modern device.

5. Organisational support

5.1. If you use (if answer for above is 'B' who introduced it to you

A. C.D.B
B. K.A.U.
C. Co-op: Society
D. Krishi Bhavan
E. C.P.C.R.I
F. Others.....

6. Seasonality in sales

6.1: Specify the months in which you have:

Months

High sales: .....

Moderate sale: .....

Low sale: .....

7. Sales Volume season wise

7.1: State the number of nuts you sell:

	Max:	Min:
During Summer:		
During non-summer:		

8. Variation in selling price-season wise

8.1: What is your Average selling price per nut:

	Min:	Max:
During summer		
During Non-summer:		

9. Market share of tender nuts

9.1: Show the percentage of sales of each of the following items in your stalls (cool bars need answer)

A. Tender nut
B. Cool drinks (Cola etc)
C. Sugar cane juice
D. Fruit juice
E. Mineral water
F. Others.....

10. Suitable location to sell tender nuts

10.1: In your opinion which place is suitable to sell tender nuts

A. N.H. Road side
B. Near Market place
C. Near college
D. Near Park
E. Near sea-side
F. Near Cinema
G. Near Bus stand
H. Others....

APPENDIX IV

Index numbers for Area, production and productivity of Coconut in the three major producing states for 10 years 1991-92 Base year

Years	Karnataka						Kerala						Tamil Nadu					
	Area		Production		Productivity		Area		Production		Productivity		Area		Production		Productivity	
	Over Index	Percentage change previous year	Over Index	Percentage change previous year	Over Index	Percentage change previous year	Over Index	Percentage change previous year	Over Index	Percentage change previous year	Over Index	Percentage change previous year	Over Index	Percentage change previous year	Over Index	Percentage change previous year	Over Index	Percentage change previous year
1991-92	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0
1992-93	103.27	3.27	103.62	3.62	100.35	0.35	101.62	1.62	110.41	10.41	108.65	8.65	117.4	17.4	122.09	22.09	103.99	3.99
1993-94	106.15	2.79	106.77	3.04	100.60	0.25	102.22	0.60	111.88	1.34	109.45	0.74	113.53	-3.29	120.16	-1.58	105.83	1.77
1994-95	110.75	4.33	111.33	4.27	100.52	-0.08	105.55	3.25	114.98	2.76	108.95	-0.46	124.26	9.44	157.69	31.23	126.91	19.91
1995-96	117.03	5.67	118.41	6.36	101.19	0.66	105.95	0.37	111.08	-3.39	104.85	-3.76	134.23	8.02	118.21	-25.04	88.07	-30.6
196-97	122.33	4.53	122.25	3.24	99.94	-1.23	104.52	-1.34	113.69	2.36	108.78	3.74	136.5	1.70	138.28	16.98	101.3	15.02
1997-98	126.93	3.77	126.53	3.50	99.69	-0.25	102.47	-1.97	112.25	-1.27	109.56	0.72	146.42	7.26	158.1	14.33	107.98	6.59
1998-99	130.30	2.65	131.52	3.94	100.95	1.27	102.23	-0.23	110.58	-1.49	108.18	-1.26	114.39	-21.87	121.03	-23.45	105.81	-2.01
1999-2000	134.83	3.48	136.44	3.74	101.21	0.25	104.18	1.91	111.33	0.68	106.88	-1,20	126.52	10.61	116.92	-3.40	92.41	-12.66
2000-01	140.12	3.92	143.16	4.93	102.18	0.96	108.49	4.14	118.42	6.37	109.17	2.14	134.62	6.4	114.61	-1.99	85.13	-7.88

Source: Indian Coconut Journal – January – 2004.

Coconut Conversion Table - Kerala
(in metric tonnes of 1,000 kilos)

APPENDIX V

COCONUT PRODUCTS	FRESH COCO-NUT MEAT	COPRA	COCONUT OIL	COPRA CAKE/ MEAL	DESICCATED COCONUT	COCONUT SHELL	SHELL CHAR-COAL	SHELL FLOUR	COCONUT HUSK	MASTRESS COIR FIBRE	COIR BRISTLE	COIR DUST & SHORTS	WHOLE NUTS	HUSKED NUTS	COCONUT WATER	NO. OF NUTS REQUIRED
1 MT Fresh Coconut Meat	1.000	0.550	0.347	0.190	0.540								3.800	3.300		3750
1 MT Copra	1.810	1.000	0.640	0.290	0.960								9.900	3.950		6750
1 MT Coconut Oil	2.900	1.595	1.000	0.550	1.480								15.800	6.250		10700
1 MT Copra Cake / Meal	5.250	2.900	1.780	1.000	3.270								37.400	14.700		19300
1 MT Desiccated Coconut	2.000	1.040	0.670	0.300	1.000								10.000	4.000		7250
1 MT Coconut Shell						1.000	0.330	0.750					12.700	5.050		9000
1 MT Shell Charcoal						3.000	1.000	2.270					39.000	12.000		27000
1 MT Shell Flour						1.330	0.440	1.000					13.000	4.500		12000
1 MT Coconut Husk									1.000	0.300	0.100	0.600	1.150			1200
1 MT Matress Coir Fibre									3.330	1.000			4.000			5000
1 MT Coir Bristle									10.000		1.000		15.000			14500
1 MT Coir Dust & Shorts									1.670			1.000	2.000			2500
1 MT Whole Nuts	1.816	0.100	0.060	0.030	0.095	0.096	0.030	0.070	0.600	0.180	0.060	0.360	1.000	0.410	0.085	750
1 MT Husked Nuts	0.470	2.40	0.160	0.070	0.240	0.235	0.080	0.175					2.440	1.000	0.210	2000
1 MT Coconut Water													11.760	4.820	1.000	9500
1,000 Whole Nuts	0.265	0.147	0.092	0.051	0.140	0.114	0.038	0.760	0.880	0.260	0.080	0.500	1.140	0.460	0.090	1000

APPENDIX VI

Coconut Conversion Table - Tamil Nadu
(in metric tonnes of 1,000 kilos)

COCONUT PRODUCTS	FRESH COCO-NUT MEAT	COPRA	COCONUT OIL	COPRA CAKE/ MEAL	DESICCATED COCONUT	COCONUT SHELL	SHELL CHAR-COAL	SHELL FLOUR	COCONUT HUSK	MASTRESS - COIR FIBRE	COIR BRISTLE	COIR DUST & SHORTS	WHOLE NUTS	HUSKED NUTS	COCONUT WATER	NO. OF NUTS REQUIRED
1 MT Fresh Coconut Meat	1.000	0.510	0.330	0.150	0.510								5.980	2.000		4065
1 MT Copra	1.960	1.000	0.640	0.290	1.000								11.700	3.900		8000
1 MT Coconut Oil	3.000	1.540	1.000	0.450	1.540								18.000	6.000		12300
1 MT Copra Cake / Meal	6.660	3.400	2.200	1.000	3.400								39.800	13.260		27000
1 MT Desiccated Coconut	1.960	1.000	0.640	0.290	1.000								11.700	3.900		8000
1 MT Coconut Shell						1.000	0.330	0.750					11.300	3.760		8000
1 MT Shell Charcoal						3.000	1.000	2.270					34.200	11.700		24000
1 MT Shell Flour						1.330	0.440	1.000					15.000	5.600		10500
1 MT Coconut Husk									1.000	0.300	0.100	0.600	1.520			1050
1 MT Matress Coir Fibre									3.330	1.000			5.000			3500
1 MT Coir Bristle									10.000		1.000		15.200			10500
1 MT Coir Dust & Shorts									1.670			1.000	2.530			1750
1 MT Whole Nuts	0.165	0.085	0.055	0.025	0.085	0.090	0.030	0.650	0.650	0.200	0.065	0.390	1.000	0.340	0.070	700
1 MT Husked Nuts	3.000	0.255	0.165	0.075	0.255	0.265	0.90	0.200					3.000	1.000	0.170	2100
1 MT Coconut Water													16.660	5.670	1.000	12000
1,000 Whole Nuts	0.250	0.125	0.080	0.040	0.125	0.125	0.040	0.090	0.950	0.285	0.090	0.570	1.470	0.490	0.065	1000

APPENDIX VII

Coconut Conversion Table - Karnataka
(in metric tonnes of 1,000 kilos)

COCONUT PRODUCTS	FRESH COCO-NUT MEAT	COPRA	COCONUT OIL	COPRA CAKE/ MEAL	DESICCATED COCONUT	COCONUT SHELL	SHELL CHAR-COAL	SHELL FLOUR	COCONUT HUSK	MASTRESS COIR FIBRE	COIR BRISTLE	COIR DUST & SHORTS	WHOLE NUTS	HUSKED NUTS	COCONUT WATER	NO. OF NUTS REQUIRED
1 MT Fresh Coconut Meat	1.000	0.560	0.340	0.185	0.550								4.720	1.970		5090
1 MT Copra	1.780	1.000	0.610	0.330	0.980								8.420	3.510		9090
1 MT Coconut Oil	2.940	1.640	1.000	0.540	1.610								13.800	5.750		14900
1 MT Copra Cake / Meal	5.400	3.000	1.830	1.000	2.970								25.510	10.640		27500
1 MT Desiccated Coconut	1.810	1.020	0.620	0.034	1.000								8.580	3.580		9250
1 MT Coconut Shell						1.000	0.330	0.750					8.580	3.710		9000
1 MT Shell Charcoal						3.000	1.000	2.270					26.000	11.340		27500
1 MT Shell Flour						1.330	0.440	1.000					11.440	4.940		12000
1 MT Coconut Husk									1.000	0.300	0.100	0.600	1.760			1800
1 MT Matress Coir Fibre									3.330	1.000			5.870			6000
1 MT Coir Bristle									10.000		1.000		17.600			18000
1 MT Coir Dust & Shorts									1.670			1.000	2.940			3000
1 MT Whole Nuts	0.210	0.120	0.070	0.040	0.116	0.110	0.040	0.085	0.570	0.170	0.056	0.340	1.000	0.420	0.070	1078
1 MT Husked Nuts	0.500	0.290	0.170	0.090	0.280	0.270	0.080	0.170					2.390	1.000	0.170	2600
1 MT Coconut Water													14.000	5.880	1.000	15200
1,000 Whole Nuts	0.200	0.110	0.065	0.035	0.110	0.110	0.035	0.080	0.550	0.165	0.055	0.340	0.930	0.390	0.065	1000

APPENDIX VIII

Coconut Conversion Table - Andhra Pradesh
(in metric tonnes of 1,000 kilos)

COCONUT PRODUCTS	FRESH COCO-NUT MEAT	COPRA	COCONUT OIL	COPRA CAKE/ MEAL	DESICCATED COCONUT	COCONUT SHELL	SHELL CHAR-COAL	SHELL FLOUR	COCONUT HUSK	MASTRESS COIR FIBRE	COIR BRISTLE	COIR DUST & SHORTS	WHOLE NUTS	HUSKED NUTS	COCONUT WATER	NO. OF NUTS REQUIRED
1 MT Fresh Coconut Meat	1.000	0.510	0.300	0.174	0.480								5.510	2.000		4500
1 MT Copra	1.961	1.000	0.600	0.340	0.940								10.800	3.920		8800
1 MT Coconut Oil	3.330	1.670	1.000	0.580	1.600								18.370	6.670		15000
1 MT Copra Cake / Meal	5.740	2.930	1.720	1.000	2.750								31.660	11.500		26000
1 MT Desiccated Coconut	2.080	1.060	0.625	0.360	1.000								11.470	4.170		9500
1 MT Coconut Shell						1.000	0.330	0.750					11.890	7.530		10000
1 MT Shell Charcoal						3.330	1.000	2.270					36.000	22.810		30000
1 MT Shell Flour						1.330	0.440	1.000					15.850	10.000		13300
1 MT Coconut Husk									1.000	0.300	0.100	0.600	1.570			1300
1 MT Matress Coir Fibre									3.330	1.000			5.240			4300
1 MT Coir Bristle									10.000		1.000		15.700			13000
1 MT Coir Dust & Shorts									1.670			1.000	2.610			2200
1 MT Whole Nuts	0.180	0.092	0.054	0.030	0.087	0.084	0.027	0.060	0.630	0.190	0.060	0.380	1.000	0.360	0.070	850
1 MT Husked Nuts	0.500	0.255	0.150	0.087	0.240	0.132	0.040	0.100					2.750	1.000	0.170	2250
1 MT Coconut Water													14.280	5.140	1.000	12000
1,000 Whole Nuts	0.230	0.113	0.065	0.038	0.106	0.100	0.030	0.075	0.770	0.230	0.075	0.460	1.220	0.450	0.065	1000

Coconut Conversion Table - Orissa
(in metric tonnes of 1,000 kilos)

COCONUT PRODUCTS	FRESH COCO-NUT MEAT	COPRA	COCONUT OIL	COPRA CAKE/ MEAL	DESICCATED COCONUT	COCONUT SHELL	SHELL CHAR-COAL	SHELL FLOUR	COCONUT HUSK	MASTRESS COIR FIBRE	COIR BRISTLE	COIR DUST & SHORTS	WHOLE NUTS	HUSKED NUTS	COCONUT WATER	NO. OF NUTS REQUIRED
1 MT Fresh Coconut Meat	1.000	0.510	0.300	0.150	0.490								5.130	2.100		4500
1 MT Copra	1.960	1.000	0.640	0.290	0.960								10.000	4.100		8800
1 MT Coconut Oil	3.030	1.540	1.000	0.450	1.480								15.544	6.360		14000
1 MT Copra Cake / Meal	6.670	3.400	2.200	1.000	3.270								34.200	14.000		30000
1 MT Desiccated Coconut	2.000	1.040	0.670	0.300	1.000								10.500	4.280		9200
1 MT Coconut Shell						1.000	0.330	0.750					10.360	4.230		9000
1 MT Shell Charcoal						3.000	1.000	2.270					31.390	12.810		27000
1 MT Shell Flour						1.330	0.440	1.000					13.810	12.810		12000
1 MT Coconut Husk									1.000	0.300	0.100	0.600	1.660			1450
1 MT Matress Coir Fibre									3.330	1.000			5.530			5000
1 MT Coir Bristle									10.000		1.000		16.600			145000
1 MT Coir Dust & Shorts									1.670			1.000	2.760			2500
1 MT Whole Nuts	1.940	0.100	0.060	0.030	0.095	0.096	0.030	0.070	0.060	0.180	0.060	0.360	1.000	0.410	0.085	900
1 MT Husked Nuts	0.470	0.240	0.160	0.070	0.240	0.235	0.080	0.175					2.440	1.000	0.210	2200
1 MT Coconut Water													11.760	4.820	1.000	10500
1,000 Whole Nuts	0.200	0.110	0.070	0.030	0.110	0.120	0.030	0.080	0.690	0.200	0.070	0.410	1.140	0.460	0.090	1000

APPENDIX X

Type and Distribution of Milling Units in India

State	Expeller		Rotary		Total number of Milling units	Installed capacity per shift of 8 hrs (in quintals)		
	Number of Units	Machinery	Number of Units	Machinery		Expeller	Rotary	Total
Kerala	79	137	1009	2901	1088	1829	3868	5967
Maha-rashtra	25	112	3	8	28	3098	10	3108
A.P	1	2	129	158	130	6	349	355
Karna-taka	2	3	105	214	107	21	390	411
T.N	3	3	70	187	73	13	401	414
West Bengal	11	51	-	-	11	556	-	556
Gujrat	-	-	2	4	2	-	4	4
Total	121	308	1318	3472	1439	5523	5022	10545

Source: Coconut Statistics.

APPENDIX XI

Forward Trading Prices in Coconut oil
(Kochi Market)

Month	Contracts (Rs./Qntl.)		
	MAY	JUNE	JULY
01/05/2002			
02/05/2002	4110	4340	4450
03/05/2002	4050	4310	4440
04/052002	4000	4325	4450
05/05/2002			
06/05/2002	3990	4335	4475
07/05/2002	4025	4350	4495
08/05/2002	4040	4360	4495
09/05/2002	4015	4340	4485
10/05/2002	3975	4285	4450
11/05/2002	3940	4260	4465
12/05/2002			
13/05/2002	3675	4225	4440
14/05/2002	3900	4200	4435
15/05/2002	3900	4185	4425
16/05/2002	3900	4185	4425
17/05/2002	3875	4150	4325
18/05/2002	3900	4150	4345
19/05/2002			
	JUN	JUL	AUG
20/05/2002	4150	4300	4475
21/05/2002	4125	4285	4450
22/05/2002	4050	4185	4375
23/05/2002	4000	4150	4340
24/05/2002			
25/05/2002	4050	4175	4370
26/05/2002			
27/05/2002	4050	4175	4375
28/05/2002	4075	4275	4400
29/05/2002	4160	4370	4450
30/05/2002	4165	4375	4460
31/05/2002	4100	4300	4425
01/06/2002	4090	4290	4400

02/06/2002			
03/06/2002	4075	4315	4405
04/06/2002	4100	4315	4430
05/06/2002	4130	4350	4470
06/06/2002	4175	4375	4480
07/06/2002	4110	4350	4450
08/06/2002	4130	4375	4480
09/06/2002			
10/06/2002	4185	4435	4550
11/06/2002	4225	4440	4625
12/06/2002	4225	4430	4660
13/06/2002	4325	4530	4750
14/06/2002	4400	4575	4790
15/06/2002	4420	4600	4755
16/06/2002			
17/06/2002	4325	4550	4710
18/06/2002	4275	4565	4720
19/06/2002	4375	4570	4750
	JUL	AUG	SEP
20/06/2002	4660	4840	5000
21/06/2002	4760	4925	5060
22/06/2002	4860	5025	5160
23/06/2002			
24/06/2002	4960	5125	5260
25/06/2002	4925	5140	5260
26/06/2002	4870	5130	5270
27/06/2002	4770	5050	5230
28/06/2002	4810	5150	5330
29/06/2002	4910	5250	5430
30/06/2002			
01/07/2002	4960	5350	5530
02/07/2002	4860	5250	5430
03/07/2002	4770	5300	5450
04/07/2002	4860	5300	4440
05/07/2002	4850	5235	5450
06/07/2002	4750	5135	5350
07/07/2002			
08/07/2002	4700	5110	5290
09/07/2002	4725	5170	5340
10/07/2002	4700	515	5260

11/07/2002	4690	5050	5230
12/07/2002	4670	4950	5150
13/07/2002	4570	4850	5050
14/07/2002			
15/0/2002	4570	4900	5105
16/07/2002	4670	5000	5205
17/07/2002	4670	5080	5260
18/07/2002	4670	4980	5160
19/07/2002	4700	5000	5130
	AUG	SEP	OCT
20/07/2002	5000	5125	0
21/07/2002			
22/07/2002	5060	5215	0
23/07/2002	5025	5225	5450
24/07/2002	4925	5135	5350
25/07/2002	4940	5160	5370
26/07/2002	4945	5175	5390
27/07/2002	4925	5170	5375
28/07/2002			
29/07/2002	4860	5100	5300
30/07/2002	4855	5110	5300
31/07/2002	4865	5150	5325
01/08/2002	4940	5180	5340
02/08/2002	4950	5200	5325
03/08/2002	4930	5175	5325
04/08/2002			
05/08/2002	4900	5135	5275
06/08/2002			
07/08/2002	4800	5035	5180
08/0/2002	4725	5010	5225
09/08/2002	4725	4040	5160
10/08/2002	4675	4900	5140
11/08/2002			
12/08/2002	4600	4800	5050
13/08/2002	4650	4825	5025
14/08/2002	4575	4750	4940
15/08/2002			
16/08/2002	4600	4780	4960
17/08/2002	4600	4735	4935
18/08/2022			

19/08/2002	4550	4735	4635
	SEP	OCT	NOV
20/08/2002			
21/08/2002			
22/08/2002	4800	5000	5140
23/08/2002	4775	4975	5135
24/08/2002	4785	4975	5135
25/08/2002			
26/08/2002	4795	4995	5170
27/08/2002	4860	5050	5245
28/08/2002	4860	5090	5200
29/08/2002	4825	5035	5170
30/08/2002	4785	5035	5175
31/08/2002	4795	5050	5170
01/09/2002			
02/09/2002	4765	5030	5150
03/09/2002	4700	4985	5125
04/09/2002	4730	5020	5150
05/09/2002	4750	5000	5140
06/09/2002	4715	4975	5130
07/09/2002	4675	4940	5090
08/09/2002			
09/09/2002	4675	4945	5090
10/09/2002	4630	4910	5080
11/09/2002	4670	4890	5055
12/09/2002	4640	4975	5040
13/09/2002	4640	4870	5050
14/09/2002	4600	4835	5000
15/09/2002			
16/09/2002	4510	4760	4920
17/09/2002	4510	4750	4920
18/09/2002	4540	4760	4970
19/09/2002	4540	4780	4970
	OCT	NOV	DEC
20/09/2002	4800	4990	5125
21/09/2002			
22/09/2002			
23/09/2002	4700	4890	5025
24/09/2002	4685	4845	4945
25/09/2002	4640	4800	4890

05/11/2002	5140	5285	5285
06/11/2002	5160	5300	5310
07/11/2002	5180	5335	5355
08/11/2002	5225	5405	5415
09/11/2002	5265	5475	5475
10/11/2002			
11/11/2002	5365	5575	5575
12/11/2002	5465	5675	5675
13/11/2002	5500	5600	5625
14/11/2002	5500	5595	5630
15/11/2002	5490	5655	5675
16/11/2002	5490	5700	5725
17/11/2002			
18/11/2002	5500	5705	5725
19/11/2002	5525	5695	5730
	DEC	JAN	FEB
20/11/2002	5755	5825	5835
21/11/2002	5855	5925	5935
22/11/2002	5855	5920	5925
23/11/2002	5775	5830	5830
24/11/2002			
25/11/2002	5750	5790	5790
26/11/2002	5825	5840	5840
27/11/2002	5725	5740	5740
28/11/2002	5750	5800	5800
29/11/2002	5745	5800	5800
30/11/2002	5690	5755	5758
01/12/2002			
02/12/2002	5650	5710	5690
03/12/2002	5630	5655	5640
04/12/2002	5590	5655	5640
05/12/2002	5595	5630	5600
06/12/2002			
07/12/2002	5665	5710	5670
08/12/2002			
09/12/2002	5675	5755	5685
10/12/2002	5600	5670	5585
11/12/2002	5550	5640	5540
12/12/2002	5500	5550	5460
13/12/2002	5400	5450	5360

14/12/2002	5350	5380	5265
15/12/2002			
16/12/2002	5275	5340	5240
17/12/2002	5340	5440	5340
18/12/2002	5440	5540	5440
19/12/2002	5425	5465	5360
	JAN	FEB	MAR
20/12/2002	5425	5325	5050
21/12/2002	5385	5290	5000
22/12/2002			
23/12/2002	5285	5190	4900
24/12/2002	5220	5130	4880
25/12/2002			
26/12/2002	5150	5105	4855
27/12/2002	5205	5120	4915
28/12/2002	5300	5215	4980
29/12/2002			
30/12/2002	5395	5310	5075
31/12/2002	5375	5280	5010
02/01/2003	5360	5260	4970
03/01/2003	5335	5230	4915
04/01/2003	5335	5235	4900
06/01/2003	5385	5275	4960
07/01/2003	5355	5250	4920
08/01/2003	5310	5220	4885
09/01/2003	5230	5130	4840
10/01/2003	5180	5130	4840
11/01/2003	5175	5120	4825
13/01/2003	5165	5145	4845
14/01/2003	5200	5185	4890
15/01/2003	5240	5185	4895
16/01/2003	5235	5200	4905
17/01/2003	5270	5250	4945
18/01/2003	5250	5255	4955
	FEB	MAR	APR
20/01/2003	5215	4915	4765
21/01/2003	5235	4925	4770

10/04/2003	5220	5140	5160
11/04/2003	5200	5125	5160
12/04/2003	5175	51`35	5165
13/04/2003 Holiday			
14/04/2003			
15/04/2003			
16/04/2003	5195	5175	5190
17/04/2003	5200	5165	5180
18/04/2003	5250	5160	5175
19/04/2003	5250	5160	5175
	MAY	JUN	JUL
20/04/2003			
21/04/2003	5125	5155	5200
22/04/2003	5140	5175	5210
23/04/2003	5150	5190	5220
24/04/2004	5155	5200	5235
25/04/2003	5160	5205	5235
26/04/2003	5150	5180	5225
27/04/2003			
28/04/2003	5145	5190	5220
29/04/2003	5165	5195	5235
20/04/2003	5160	5205	5240
01/05/2003			
02/05/2003	5150	5200	5240
03/05/2003			
04/05/2003			
05/05/2003	5125	5180	5230
06/05/2003	5130	5175	5230
07/05/2003	5130	5170	5230
08/05/2003	5130	5175	5240
09/05/2003	5130	5175	5235
10/05/2003	5150	5180	5240
11/05/2003			
12/05/2003	5195	5195	5255
13/05/2003	5210	5220	5265
14/05/2003			
15/05/2003	5235	5230	5265
16/05/2003	5255	5250	5275
17/05/2003	5230	5215	5255

18/05/2003			
19/05/2003	5230	5195	5240
	JUN	JUL	AUG
20/05/2003	5210	5260	5325
21/05/2003			
22/05/2003	5190	5255	5335
23/05/2003	5155	5230	5315
24/05/2003	5140	5220	5325
25/05/2003			
26/05/2003	5125	5225	5325
27/05/2003	5135	5225	5330
28/05/2003	5115	5220	5320
29/05/2003	5015	5135	5260
30/05/2003	4975	5100	5235
31/05/2003	4935	5080	5200
01/06/2003			
02/06/2003	4890	5065	5175
03/06/2003	4870	5080	5200
04/06/2003	4825	5140	5245
05/06/2003	4895	5150	5250
06/06/2003	4925	5165	260
07/06/2003	4895	5135	5265
08/06/2003			
09/06/2003	4895	5125	5250
10/06/2003	4900	5135	5260
11/06/2003	4940	5160	5295
12/06/2003	4950	5175	5315
13/06/2003	4970	5175	5325
14/06/2003	5000	5180	5320
15/06/2003			
16/06/2003	5000	5180	5320
17/06/2003	5030	5200	5335
18/06/2003	5080	5220	5350
19/06/2003	5080	5270	5400
	JUL	AUG	SEP
20/06/2003	5340	5480	5600
21/06/2003	5375	5550	5670
22/06/2003			
23/06/2003	5330	5540	5650
24/06/2003	5280	5455	5605

25/06/2003	5295	5430	5610
26/06/2003	5275	5410	5615
27/06/2003	5310	5425	5620
28/06/2003	5360	5470	5665
29/06/2003			
30/06/2003	5375	5520	5660
01/07/2003	5390	5535	5660
02/07/2003	5380	5510	5650
03/07/2003	5375	5480	5630
04/07/2003	5375	5510	5650
05/07/2003	5385	5540	5660
06/07/2003			
07/07/2003	5405	5540	5655
08/07/2003	5390	5635	5635
09/07/2003	5405	5550	5650
10/07/2003	5400	5550	5650
11/07/2003	5410	5665	5675
12/07/2003	5460	5575	5675
13/07/2003			
14/07/2003	5440	5545	5655
15/07/2003	5405	5555	5670
16/07/2003	5425	5570	5680
17/07/2003	5425	5570	5675
18/07/2003	54000	5570	5675
19/07/2003	5310	5555	5670
	AUG	SEP	OCT
20/07/2003			
21/07/2003	5550	5670	5730
22/07/2003	5545	5665	5725
23/07/2003	5555	5670	5745
24/07/2003	5595	5720	5800
25/07/2003	5630	5750	5855
26/07/2003	5650	5785	5890
27/07/2003			
28/07/2003	5630	5775	5865
29/07/2003	5610	5765	5865
30/07/2003	5575	5735	5835
31/07/2003	5615	5770	5670
01/08/2003	5645	5800	5900
02/08/2003	5670	5835	5930

03/08/2003			
04/08/2003	5700	5865	5950
05/08/2003	5800	5965	6050
06/08/2003	5860	6035	6135
07/08/2003	5765	5985	6085
08/08/2003	5790	6000	6110
09/08/2003	5790	6015	6125
10/08/2003			
11/08/2003	5800	6050	6155
12/08/2003	5800	6085	6195
13/08/2003	5895	6180	6285
14/08/2003	5900	6220	6335
15/08/2003			
16/08/2003	5860	6205	6325
17/08/2003			
18/08/2003	5760	6175	6320
19/08/2003	5845	6235	6380
	SEP	OCT	NOV
20/08/2003	6300	6470	6660
21/08/2003	6310	6530	6735
22/08/2003	6310	6550	6740
23/08/2003	6290	6530	6730
24/08/2003			
25/08/2003	6190	6500	6670
26/08/2003	6175	6500	6700
27/08/2003	6200	6540	6735
28/08/2003	6260	6570	6775
29/08/2003	6215	6525	6725
20/08/2003	6215	6225	6725
31/08/2003			
01/09/2003	6195	6535	6720
02/09/2003	6115	6485	6695
03/09/2003	6100	6445	6665
04/09/2003	6100	6480	6690
05/09/2003	6140	6530	6735
06/09/2003	6155	8485	6705
07/09/2003			
08/09/2003			
09/09/2003			
10/09/2003	6090	6480	6710

11/09/2003	6090	6490	6725
12/09/2003	6155	6520	6750
13/09/2003	6185	6580	6780
14/09/2003			
15/09/2003	6225	6580	6825
16/09/2003	6220	6590	6825
17/09/2003	6275	6675	6900
18/09/2003	6325	6775	6995
19/09/2003	6400	6775	7025
	OCT	NOV	DEC
20/09/2003	6740	7000	7145
21/09/2003			
22/09/2003	6730	7010	7170
23/09/2003			
24/09/2003	6730	7040	7215
25/09/2003	6745	7125	7310
26/10/2003	6700	7125	7315
27/09/2003	6695	7135	7320
28/09/2003			
29/09/2003	8600	7105	7305
30/09/2003			
01/10/2003	6520	7015	7275
02/10/2003			
03/10/2003	6545	7040	7310
04/10/2003			
05/10/2003			
06/10/2003	6630	7130	7370
07/10/2003	6670	7170	7405
08/10/1002	6610	7130	7380
09/10/2003	6610	7125	7375
10/10/2003	6595	7090	7365
11/10/2003	6620	7115	7390
12/10/2002			
13/10/2003	6650	7120	7405
14/10/2003	6640	7090	7385
15/10/2003	6630	7060	7355
16/10/2003	6685	7015	7350
17/11/2003	6610	6980	7320
18/10/2003	6520	6990	7310
19/10/2003			

	NOV	DEC	JAN
20/10/2003	6935	7290	7270
21/10/2003	6900	7255	7190
22/10/2003	6900	7250	7205
23/10/2003	6880	7225	7116
24/10/2003			
25/10/2003			
26/10/2003			deewali
27/10/2003	6820	7260	7150
28/10/2003	6885	7225	7095
29/10/2003	6815	7170	7010
30/10/2003	6830	7190	7030
31/10/2003	6825	7175	6995
01/11/2003	6775	7090	6920
02/11/2003			
03/11/2003	6770	7075	6865
04/11/2003	6690	6980	6765
05/11/2003	6590	6880	665
06/11/2003	6555	6855	6715
07/11/2003	6565	6810	6675
08/11/2003	6565	6815	6690
09/11/2003			
10/11/2003	6600	6815	6715
11/11/2003	6540	6725	6615
12/11/2003	6550	6625	6515
13/11/2003	6500	6540	6415
14/11/2003	6520	6525	6325
15/11/2003	6530	6495	6295
16/11/2003			
17/11/2003	6525	6425	6215
18/11/2003	6425	6325	6115
19/11/2003	6350	6225	6015
	DEC	JAN	FEB
20/11/2003	6125	5915	5540
21/11/2003	6225	6015	5635
22/11/2003			
23/11/2003			
24/11/2003			
25/11/2003			
26/11/2003	6170	5965	5580

27/11/2003	6115	5925	5510
28/11/2003	6100	5910	5500
29/11/2003	6100	5920	5490
30/11/2003			
01/12/2003	6160	5945	5550
02/12/2003	6060	5860	5485
03/12/2003	5960	5765	5425
04/12/2003	5875	5750	5450
05/12/2003	5850	5740	5450
06/12/2003	5890	5830	5515
07/12/2003			
08/12/2003	5990	5930	5615
09/12/2003	6090	6030	5700
10/12/2003	6190	6130	5780
11/12/2003	6290	6230	5840
12/12/2003	6390	6330	5900
13/12/2003	6455	6250	5800
14/12/2003			
15/12/2003	6325	6165	5710
16/12/2003			
17/12/2003	6310	6065	5615
18/12/2003	6375	6035	5525
19/12/2003	6450	6090	5565
	JAN	FEB	MAR
20/12/2003	6090	5550	5345
21/12/2003			
27/12/2003	6055	5510	5325
28/12/2003			
29/12/2003	6010	5460	5285
30/12/2003	5935	5400	5250
31/12/2003	5975	5450	5295
01/01/2004			
02/01/2004	5960	5450	5280
03/01/2004	5975	5475	5280
04/01/2004			
05/01/2004	5965	5465	5285
06/01/2004			
07/01/2004	5970	5465	5295
08/01/2004	5925	5450	5285
09/01/2004	5925	5525	5320

10/01/2004	5900	5505	5310
11/01/2004			
12/01/2004	5850	5505	5310
13/01/2004	5860	5515	5310
14/01/2004	5860	5500	5300
15/01/2004	5800	5410	5210
16/01/2004	5810	5405	5225
17/01/2004	5795	5390	5185
18/01/2004			
19/01/2004	5695	5300	5100
	FEB	MAR	APR
20/01/2004	5250	5060	4850
21/01/2004	5350	5160	4945
22/01/2004			

10/01/2004	5900	5505	5310
11/01/2004			
12/01/2004	5850	5505	5310
13/01/2004	5860	5515	5310
14/01/2004	5860	5500	5300
15/01/2004	5800	5410	5210
16/01/2004	5810	5405	5225
17/01/2004	5795	5390	5185
18/01/2004			
19/01/2004	5695	5300	5100
	FEB	MAR	APR
20/01/2004	5250	5060	4850
21/01/2004	5350	5160	4945
22/01/2004			

APPENDIX XII

Export of Coir and Coir Products from India

(Year April - March)

Product Name	1999-2000		2000-2001		2001-2002	
	Qty in Tonnes	Value in Rs.Lakhs	Qty in Tonnes	Value in Rs.Lakhs	Qty in Tonnes	Value in Rs.Lakhs
Curled Coir	657.28	114.57	533.56 (-18.82)	80.33	572.53 (+7.30)	80.63
Coir fibre	809. 88	117.15	1053.98 (+30.14)	148.17	1010.30 (-4.14)	122.15
Coir rugs	2889.64	2259.62	2720.44 (5.85)	1958.63	1329.97 (-51.11)	1039.76
Coir pith	6501.59	562.77	9926.98 (+52.68)	752.79	13725.65 (+38.26)	1014.30
Coir rope	286.63	73.41	482.12 (+68.20)	145.22	348.64 (-27.68)	108.04
Coir other sorts	925.99	328.29	488.23 (-47.27)	164.49	272.91 (-44.10)	106.82
Coir yarn	13052.58	3738.40	14607.30 (-11.91)	4187.50	13206.90 (-9.58)	3728.59
Geo-textiles	1711.25	808.41	1402.29 (-18.05)	625.38	1752.05 (+24.94)	780.13
Handloom mats	24292.92	15688.72	24716.44 (+1.36)	15917.69	26147.89 (+5.79)	17009.85
Handloom mattings	6238.58	4338.55	6323.37 (+1.36)	4287.87	4423.27 (-30.04)	2921.04
Powerloom mats	1042.61	699.12	606.97 (-41.78)	442.72	686.50 (+13.10)	458.19
Powerloom mattings	531.35	395.05	410.71 (-22.70)	284.05	274.04 (-33.27)	226.10
Rubberised coir	522.88	387.52	385.06 (-26.35)	267.24	454.64 (+18.07)	350.38
Tufted mats	1567.70	793.77	3835.63 (+144.66)	2104.17	7129.54 (+85.87)	4112.38
Total	61030.88	30305.35	67493.08	31366.25	71334.81	32058.35

Source: Coir Board, Annual Report: 2000-2001 (Figures in parenthesis show increase/decrease percentage of previous year)

APPENDIX XIII

Number of toddy shops and employment potential

District	No. of Registered Employees	No. of Non-registered Employees	No. of Toddy shops
Thiruvananthapuram	848	143	116
Kollam	1279	52	238
Pathanamthitta	987	52	192
Alleppey	2464	72	362
Kottayam	3666	445	452
Idukki	2994	26	356
Ernakulam	5439	1014	448
Thrissur	6667	915	710
Palakkad	4576	1629	606
Malappuram	1117	103	206
Kozhikode & Wynad	1443	166	222
Kannur	3919	172	284
Kasargod	1136	195	156
Total	36535	5004	4348

Source: Kerala Toddy workers Welfare Board Diary 2003, Thiruvananthapuram.

APPENDIX XIV

Name of Diseases/pests and infestation level

(in per cent)

Infestation percentage / Name of disease/pest	Not affected	0-10	10-20	20-30	30-40	40-50	Above 50	Total
Mandari	0.00	0.00	0.83	2.08	20.83	44.58	31.68	100
Root (wilt)	30.82	45.42	16.25	5.42	1.67	0.42	0.00	100
Thanjavurwilt	93.83	6.67	-	-	-	-	-	100
Stem bleeding	71.67	24.58	3.75	-	-	-	-	100
Tatipaka	89.58	10.42	-	-	-	-	-	100
Bud rot	37.50	51.25	9.58	0.42	1.25	-	-	100
Lethal yellowing	55.00	35.00	9.58	0.42	-	-	-	100

Source: Compiled from survey data.

APPENDIX XV

Impact of Minimum Support Price for Copra on Market Price (in Rupees for Quintal)

Year	Price of Copra per quintal									
	M.S.P	Peak season Average	Difference in price over M.S.P.		Off season Average	Difference in Price over M.S.P.		Yearly Average	Difference in Price over M.S.P.	
				%			%			%
1990	1600	1585	-15	-1	2019	419	26	1802	202	13
1991	1700	2341	641	38	2979	1279	75	2660	960	56
1992	N.D	2912	--	--	3058	--	--	2985	--	--
1993	2150	2813	663	31	2346	196	9	2580	430	20
1994	2350	2118	-232	-10	2212	-138	-8	2165	-185	-8
1995	2500	2131	-369	-15	2502	2	0	2316	-184	-7
1996	2500	2686	186	7	3247	747	13	2967	467	19
1997	2700	3629	929	34	3338	638	24	3484	784	29
1998	2900	2827	-73	-3	3028	128	4	3194	294	10
1999	3100	3376	276	9	3636	536	17	3825	725	23
2000	3250	2710	-540	-17	2126	-1124	-35	2418	-832	-26
2001	3300	1952	-1348	-41	2124	-1176	-36	2038	-1262	-38
2002	3300	2432	-868	-26	3172	-128	-4	2802	-498	-15
2003	3320	3610	290	9	4025	705	21	3818	498	15

Source: For data up to 2000, C.D.B, Kochi, For data from 2001-2003, C.O.M.A.

APPENDIX XVI

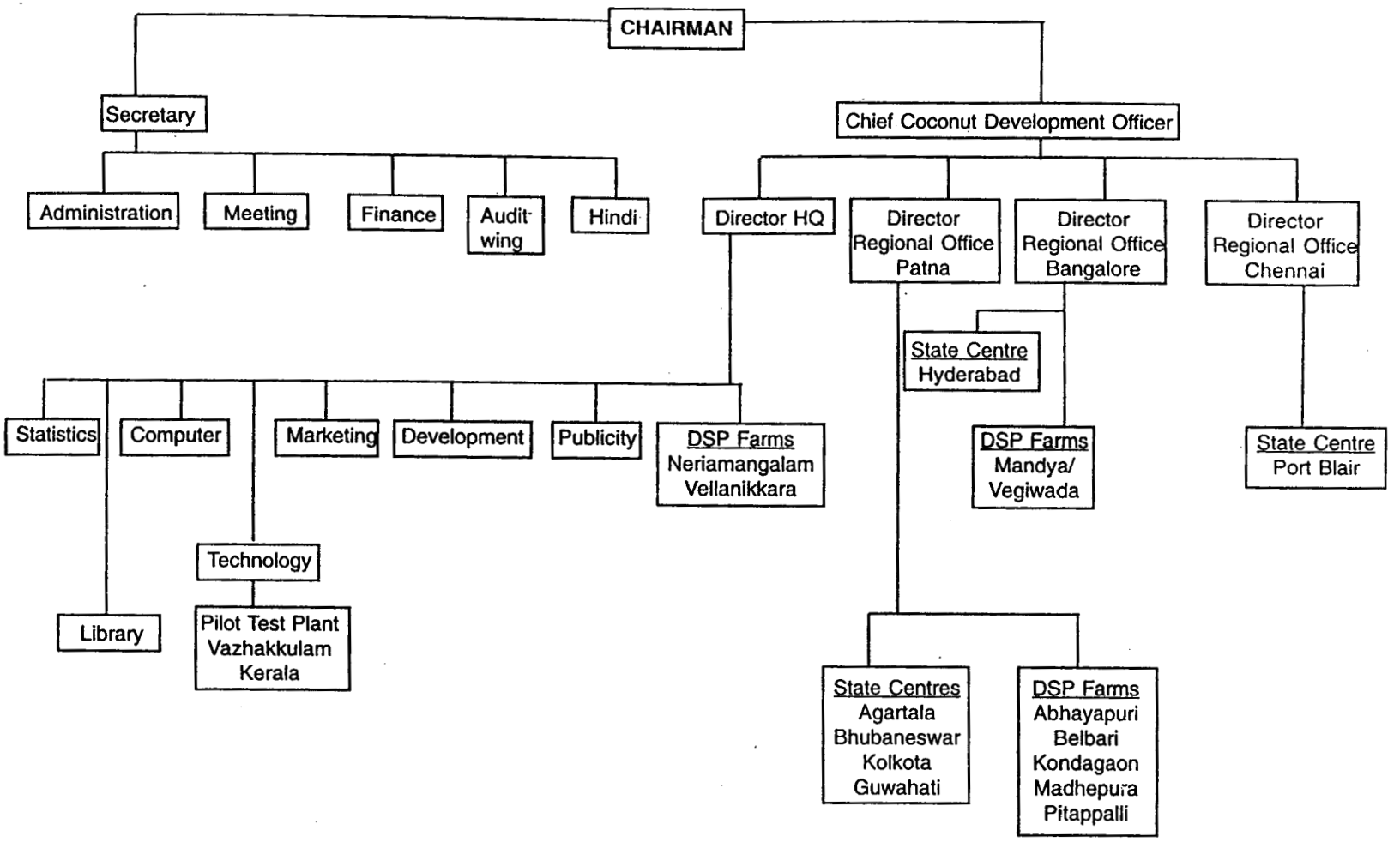
Assistance Offered by Various Institutions

(in per cent)

Institution / Assistance for	C.D.B	Co-op: Society	Dealer	K.A.U	C.P.C.R.I	Krishi Bhavan	Friends	Total
Seedlings	13.97	1.25	8.47	11.34	7.81	42.63	14.53	100
Manure	2.69	0.42	27.83	1.67	0.93	65.95	0.51	100
Pesticides	3.03	-	5.15	1.26	0.43	89.28	0.85	100
Sprayer	2.25	-	-	1.81	0.91	88.46	6.57	100
Pumpset	-	-	1.52	-	-	98.48	-	100
Modern dryer	22.22	11.11	-	50.00	11.11	5.56	-	100
Moisture metre	16.67	5.56	-	43.05	16.67	18.05	-	100
Climbing Machine	20.00	3.33	-	35.76	9.09	28.79	3.03	100
Inter cropping	34.00	-	3.17	20.85	15.80	24.59	1.59	100
Mixed farming	22.20	3.02	-	39.85	10.00	17.73	7.20	100

Source: Compiled on the basis of Survey data.

Organizational Chart - Coconut Development Board



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