

**TREND AND FLUCTUATIONS IN PRICES OF
COCONUTS AND COCONUT OIL**

DISSERTATION SUBMITTED
IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF
THE DEGREE OF MASTER OF PHILOSOPHY,
JAWAHARLAL NEHRU UNIVERSITY, NEW DELHI.

JACOB MATHEW

CENTRE FOR DEVELOPMENT STUDIES
ULLOOR, TRIVANDRUM
KERALA
1978

ACKNOWLEDGMENTS

I acknowledge my gratitude to Professor D. Krishnaji for his valuable guidance and encouragement at each stage of this study. I also thank Professor A. Vaidyanathan and Professor T.N. Krishnan, for their useful suggestions during the course of this work.

I am indebted to the Director, Central Plantation Crops Research Institute, Kasaragod, Kerala for permitting me to undergo this course and sanctioning study leave for the purpose.

My thanks are also due to the officials of the Bureau of Economics and Statistics, Kerala, Trivandrum, who allowed me to use some of their unpublished data, for purposes of this study.

The Director, Registrar, Librarian and other members of staff at the Centre for Development Studies have also been helpful to me. My thanks are especially due to Mr. T.A. Varghese, who has done an excellent job of typing the manuscript.

Trivandrum,
October 1, 1978.

Jacob Mathew

CONTENTS

		Pages
Chapter 1	THE COCONUT ECONOMY	1 - 14
1.1	The Coconut Palm	1
1.2	Characteristics of Coconut Farm Holdings	4
1.3	Changes in the Cropping Pattern	5
1.4	Coconut Products, their uses and utilization	7
1.5	Market structure	10
1.6	Scope of the present study	12
Chapter 2	LONG-TERM MOVEMENTS IN PRICES IN SELECTED MARKETS	15 - 34
2.1	Prices of Coconuts in relation to Prices of Copra and Coconut oil	15
2.2	Comparison of Prices of Coconut Oil in Different Markets	17
2.3	General Trends in the Movement of Prices in Coconut oil	19
2.4	Determinants of the Price of Coconut oil	20
2.5	Price of Coconut Oil in Relation to the Markets for other Oilseeds and Oil	29
Chapter 3	PRICE TRENDS IN KERALA	35 - 45
3.1	Economic Importance of the Crop to the State	35
3.2	Determinants of the Price of Coconut Oil in Kerala	36
3.3	Intra-State Variations in Prices	41
Chapter 4	SHORT TERM FLUCTUATIONS IN PRICES	46 - 55
4.1	Production Cycle of Coconuts	46
4.2	Seasonal Indices for Prices	46
4.3	Seasonal Variations in relation to the production Cycle of Coconuts and Pattern of Rainfall	52
4.4	Effects of Price Rise on Producers	54
Chapter 5	SUMMARY AND CONCLUSIONS	56 - 57

Chapter 1

THE COCONUT ECONOMY

1.1 The Coconut Palm

The coconut palm is one of the most useful trees in the world. It perhaps yields more products of use to the mankind than any other tree. It is no wonder that the palm is looked upon with reverence and affection by the inhabitants of the coconut producing countries and given such eulogistic epithets, such as Kalpa Vriksha (Tree of Heaven).

While the coconut palm is found growing in widely scattered areas of the world, the major producing regions are concentrated mainly in Asia. About 81 per cent of the total production of coconuts and 84 per cent of the total production of copra is from the Asian region (Table 1.1). With 14.8 per cent of the production of coconuts and 7.5 per cent of the production of copra, India ranks third in the world map of coconuts and copra, the first and second places being occupied by Philippines and Indonesia, respectively. The share of the country in the production of copra is low compared to the production of coconuts because a sizable portion of the crop of nuts is consumed in the raw form itself.

In India, the crop is confined to the coastal states only (Table 1.2). Even among the coastal States, there is regional imbalance in the distribution of the crop. Kerala - the land of coconuts - accounts for nearly 65 per cent of the area under the crop in the country and about 60 per cent of the production. Nearly 94 per cent

Table 1.1
World Production of Coconuts and Copra
(Annual average for the triennium
ending 1976)

(Quantity in '000 m.tons)

Country/Region	Coconut	Copra
World	30234 (100.0)	4388 (100.0)
Africa	1542 (5.1)	164 (3.7)
N.C. America	1479 (4.9)	192 (4.4)
South America	523 (1.7)	32 (0.7)
Asia	24532 (81.2)	3688 (84.2)
Philippines	10051 (33.2)	2108 (48.2)
Indonesia	6291 (20.8)	851 (19.4)
India	4475 (14.8)	328 (7.5)
Sri Lanka	1550 (5.1)	154 (3.5)
Others	2165 (7.3)	247 (5.6)
Oceania	2158 (7.1)	308 (7.0)

(Notes: Figures in parenthesis denote the production, expressed as percentage of world total.)

Source: "FAO Production Year Book", Rome, 1976, Vol.30.

of the total production is shared by the four southern States of Kerala, Tamil Nadu, Karnataka and Andhra Pradesh together.

To the national economy also coconut makes a significant contribution. The average annual value of the production of the crop is around Rs.5000 million, and this is about 1.8 per cent of the gross value of output from agriculture, at current prices.^{1/} While coconuts

^{1/} The gross value of output from coconut has been estimated to be Rs.5427 million during 1973-74 and Rs.5588 million during 1974-75 at current prices. The proportionate share of coconut in the gross value of output from agriculture are 2.01% and 1.83% respectively, during these two years. At 1960-61 prices, the corresponding percentages are 1.43 and 1.53, respectively ("National Accounts Statistics: 1960-61 to 1974-75" page 90).

Table 1.2

State-wise area and production of coconuts in
India (1976-77)Area: '000 hectares
Production: million nuts

State	Area	Production
Andhra Pradesh	39.3 (3.7)	162.54 (2.8)
Assam	4.9 (0.5)	25.07 (0.4)
Karnataka	153.3 (14.3)	777.88 (13.3)
Kerala	694.6 (64.6)	3443.37 (59.0)
Maharashtra	9.3 (0.9)	50.64 (0.9)
Orissa	13.2 (1.2)	53.03 (0.9)
Tamil Nadu	108.9 (10.1)	1094.90 (18.7)
Tripura	0.8 (0.1)	1.13 (nog)
West Bengal	6.7 (0.6)	22.00 (0.4)
A & N Islands	20.0 (1.9)	64.07 (1.1)
Goa, Daman and Diu	18.7 (1.7)	104.00 (1.8)
Lakshadweep	2.8 (0.3)	21.80 (0.4)
Pondicherry	1.6 (0.1)	16.68 (0.3)
All India	1074.1 (100.0)	5837.11 (100.0)

(Note: Figures in paranthesis show the area/production, expressed as percentage of all-India total)

Source: "Agricultural Situation in India", Vol.32, No.11, Feb.1978.

and coconut products such as copra and coconut oil do not figure in the export trade of the country, in a significant way, as the indigenous production is not sufficient even to meet the internal demand,^{2/} foreign

^{2/} The estimated requirements of coconuts in the country, during the end of the Fifth Five Year Plan is put at 7700 million nuts. ("Coconut Bulletin", Vol.2, No.2, page 3). During 1976-77, the production has reached only 5800 million nuts and the requirements are to fall short by about 25 per cent.

exchange amounting to over 230 million rupees annually is earned, mainly through the export of coir and coir products.^{3/} It has also been estimated that about 10 million people depend directly or indirectly on coconut culture and industries based on the processing of coconut products such as coir, for their livelihood.^{4/}

1.2 Characteristics of coconut farm holdings

Coconut is essentially a small holder's crop in the major coconut-producing countries of the world.^{5/} India is not an exception. Unlike most other commercial crops, it is grown mostly in homestead gardens and small holdings. More than 90 per cent of the holdings in the major coconut growing States of the country are one hectare or less in size and hardly two per cent have an area of at least two hectares (Table 1.3). The average size of a holding is reported to be only 0.20 ha.^{6/} The estimated number of coconut holdings for the country as a whole is about 5 million, of which about half are in Kerala State alone.^{7/}

-
- ^{3/} "Coir News" Vol.7, Nos.4 and 5. The total exports of coir and coir products from India during 1977-78 amounted to 43196 tons valued at Rs.238.56 million, compared to 44357 tons valued at Rs.227.76 million exported during 1976-77.
- ^{4/} "The Coconut Profile of India"- P.K. Thampan (Directorate of Coconut Development, Cochin - 11) (mimeo) page.3.
- ^{5/} "The Coconut Industry of Asia" (United Nations, 1969), page 11.
- ^{6/} "Coconut Bulletin", Cochin, Vol.1, No.1 (May 1970), page 4.
- ^{7/} "The Coconut Profile of India" P.K. Thampan (Directorate of Coconut Development, Cochin - 11) (Mimeo.) page 3.

Table 1.3
Distribution of coconut-holdings by size
in India

Size of holding (in hectares)	Percentage of holdings of different sizes			
	Kerala	Tamil Nadu	Karnataka	Andhra Pradesh
Less than 0.2	37.1	69.1	52.5	56.5
0.2 - 1.0	52.8	26.0	42.9	41.7
1.0 - 2.0	7.9	3.2	3.6	1.8
2.0 and above	2.2	1.7	1.0	..

Source: "Coconut Bulletin", Cochin, Vol.1, No.1.

1.3 Changes in the cropping pattern

During the period 1952-53 to 1976-77, the area under coconut in the country has gone up by about 65 per cent. The changes that have taken place during the past two decades in the area under oil seed crops and commercial crops can be seen in Table 1.4. The area under coconut was increasing at the compound growth rate (of 2.75) per cent per annum and it was almost double that of the growth rate for the five major oil seeds (groundnut, sesamum, rapeseed and mustard, castor seed and linseed) taken together. The area under groundnut, which is considered to be the most important oil seed crop in the country, ^{8/} was increasing at a rate of only 1.80 per cent. All these

^{8/} In estimating the all-India Index Numbers for total agricultural production, oil seeds as a group, has a weight of 10.96 points, of which groundnut has 4.82, coconut 1.87 and rapeseed and mustard 1.75 (Agricultural Situation in India⁷, Vol.32, No.11, page 732).

show the importance of coconut as an oil seed crop. Among the commercial crops also, coconut has an important place. Only in the case of rubber, the area was increasing at a higher rate and this is not unexpected, because rubber is comparatively a new crop with higher profit margins. The changes in the cropping pattern in Kerala resulting from high growth rates of acreage under coconut are discussed briefly in Chapter 3.

Table 1.4
Changes in the area under oilseed crops and commercial crops

Crop	Area: '000 hectares		Compound Growth Rate (%)
	Mean area under the crop for the triennium ending 1955-56	1975-76	
Groundnut	4973.7	7012.6	1.80
Castorseed	558.0	503.6	-0.51
Sesamum	2496.3	2263.3	-0.49
Rapeseed and mustard	2413.0	3492.1	1.87
Linseed	1425.7	2075.9	1.90
Total (five major oil seeds)	11866.7	15515.3	1.35
Coconuts	650.3	1114.7	2.73
Black Pepper	86.3	121.7	1.75
Tea	315.0	360.3	0.67
Coffee	96.9	156.0	2.44
Rubber	169.0	221.0	5.99

Source of basic data: "Estimates of Area and Production of Principal Crops in India, 1975-76" Directorate of Economics and Statistics, Ministry of Agriculture.

1.4 Coconut Products, their uses and utilization

Coconut provides man with a variety of products, which are of economic value in their food and industrial uses. The nuts are either consumed fresh in a wide variety of ways, or processed to yield desiccated coconut or dried to produce copra which, after crushing, yields coconut oil and oil cake. Coconut husks and shells yield coir and other by-products, such as shell charcoal.

Coconut products derived from practically all parts of coconut palm may be grouped into:

(i) Those which come from the meat of the nut, and used in the fresh state as a food or for culinary purposes and in the dried state (copra) for extraction of oil and other by-products.

(ii) The fibrous products which are derived from the husk of the coconut. This group comprises the coir fibre which is useful mainly in the manufacture of coir yarn, matting, carpets, brushes, brooms, rubber coated fibres and hardboards and in stuffing and padding cushions and mattresses.

(iii) Miscellaneous products originating from the coconut shell, the leaves, the flowers and other parts of the plant. This third group includes the shell charcoal, the shell itself, coconut water, toddy, and the products from the leaves and the trunk.

Of the varied products of coconut, husk and copra alone are commercially exploited in India. Coir manufacture and copra crushing are traditional industries in the country. The manufacture of desiccated coconut and the commercial utilisation of the shell are yet to be developed. Copra is the dried meat of the mature nut from

which the moisture content has largely been removed by sundrying or by artificial heating with the use of smoke or hot air. It is useful mainly as the source of coconut oil, and its by-product oil cake. In the case of copra with moisture content of 5 to 7 per cent, the oil content is generally between 65 and 70 per cent, of the total material. The processing of coconuts into milling copra is concentrated in Kerala State and to a lesser extent in the island groups of Lakshadweep, Andaman and Nicobar and also in the State of Tamil Nadu.

Coconut oil may be produced from fresh undried meat or from copra, either from pressing or by solvent extraction methods. The uses of coconut oil may be divided into two main categories, namely for food purposes, or as a technical raw material in soap manufacturing etc.^{9/}

According to a survey^{10/} conducted by Bureau of Economics and Statistics, Trivandrum, during the four year period 1962-66, the cultivating households were using 11.5 to 19.7 per cent of the produce

^{9/} At present in developed countries, coconut oil is more important as an ingredient for margarine than as a cooking fat or as cooking oil. Another utilisation is for special purposes in confectionery, mainly as cheap substitute for cocoa butter. The oldest technical use of coconut oil is probably for cosmetic purposes in hot countries and as a raw material for soap. It is used in almost every household both for bathing and for dressing the hair. It is also extensively used in the manufacture of toilet and cosmetic preparations, such as face creams and shampoos. Coconut oil is an almost ideal raw material for soap manufacture, because of its hardness and free lathering properties. Furthermore, the oil is easily saponified, even in the cold, so that cold process soaps made with it. A large percentage of coconut oil is now-a-days used for the manufacture of synthetic detergents, especially in the United States. ("Coconut Oil Processing" Thime J.G., FAO, Rome, 1968).

^{10/} Comprehensive Report on the Survey for correct estimation of area under and production of coconut crop in Kerala, 1962-65" and "Report on the Seventh round of the Sample survey to estimate the area under and production of coconut crop in Kerala 1965-66" (Bureau of Economics and Statistics, Trivandrum)(1967).

for home consumption in the different years; 74.6 to 78.1 percent is sold as coconuts and 1.5 to 5.2 per cent of the nuts were being converted to copra by them and the remaining were being utilised for other purposes. The pattern of utilization may be slightly different in the other States. Reliable information on the current end use pattern in the country is not available. According to studies made by the Directorate of Coconut Development, Cochin,^{11/} the annual production of milling copra in Kerala State is estimated at 2.94 lakh tons which is about 90 per cent of the total production in the country. Only about 50 per cent of the copra produced in Kerala is utilised for crushing in the local milling sector and the balance is exported to upcountry markets, mainly in Maharashtra. The production of coconut oil in the country is around 2.00 lakh tons, of which Kerala State accounts for about 95,000 tons. It has been estimated that nearly 55,000 tons of oil are marketed from Kerala annually and the balance utilised for consumption within the State, of which 50,000 tons is for edible purposes in households and 10,000 tons for non-edible toiletary uses. The combined output of oil from all the centres outside the State has been estimated at a little over 1.00 lakh tons. Thus the total availability of coconut oil for various end uses outside Kerala ranges from 1.30 lakhs to 1.40 lakh tons. Unlike in Kerala, coconut oil is not used for edible purposes in the households in the other States except where there is sizeable Malayalee population. The official estimate of the current consumption of coconut oil in soap manufacture is only 15,000 tons, against an annual output of 7.00 lakh tons of toilet and

^{11/} Thanpan P.K. and Pankajakshan A.S. (1976): Coconut Oil in India: Its Price behaviour in the last decade", "Coconut Bulletin," Vol.7, Nos.6 & 7.

laundry soaps. However, a sizable quantity may be in use in the unregistered units. Taking the country as a whole, the consumption of coconut oil for edible end use is estimated to be 80,000 tons or 40 percent of the total production and for non-edible end uses 1.20 lakh tons, or 60 per cent of total production.

1.5 Market structure

As has been already stated in section 1.4, about three-fourths of the nuts produced in Kerala are disposed of in the form of nut itself by the cultivators, after retaining about 15 per cent for their own home consumption. The number of coconut cultivators in the country has been estimated to be five million and a very large percentage of them are sellers of the produce, though in many cases, what they produce is not sufficient to meet their own needs. Possibly to meet their immediate cash needs at harvest time these poor cultivators sell a part of their output in the market or exchange it against commodities they require.

The growers sell their produce to the village merchants or to the agents of the wholesale merchants. Sales generally take place at the garden itself. Although the producers sell the bulk of the crop as unhusked nuts, a considerable part of it reaches the market and the consumers in the form of husked nuts. Copra milk makers generally purchase coconuts at the garden and unless the nuts are to be stored for making edible copra, they are usually husked on the spot. Copra makers also buy at markets and from village merchants. They often give advances to producers and village merchants, which they are adjusted against the price of the nuts brought. The relative importance of the

different agencies varies in the different areas.^{12/} For instance, in Kerala, copra makers are, by far, the most important agency in the assembling of coconuts. In Maharashtra, commission agents are the chief assembling agents. In Tamil Nadu, much of the assembling is done by the producers themselves. In Karnataka, producers and village merchants or commission agents do most of the assembling.

The main agencies concerned in assembling of copra are coconut growers, copra makers, village merchants, wholesale merchants and oil millers. Coconut growers who make copra from nuts produced in their gardens and village copra makers who assemble coconuts and make copra on a small scale, sell their copra to oil millers, or take it for sale to assembling markets. Big copra makers, having regular copra making establishments for making copra on a large scale, generally dispose of their copra to millers or wholesale merchants.

The agencies concerned in the distribution of coconut oil are the oil mills, wholesale merchants, commission agents and brokers. Oil mills dispose of their oil by selling direct, through their own sales organisations, or through brokers to wholesale merchants. Mills also send their oil for sale through commission agents at various centres

It has been stated earlier that coconut oil is produced mainly in the coconut growing areas in the west coast and at Maharashtra. Some of the oil produced in these areas is consumed locally and the surplus is sent by coastal steamers, country boats, rail and road, to various

^{12/} "Report on the Marketing of Coconuts and Coconut Products in India" (Directorate of Marketing and Inspection, Ministry of Agriculture, Nagpur) (1962).

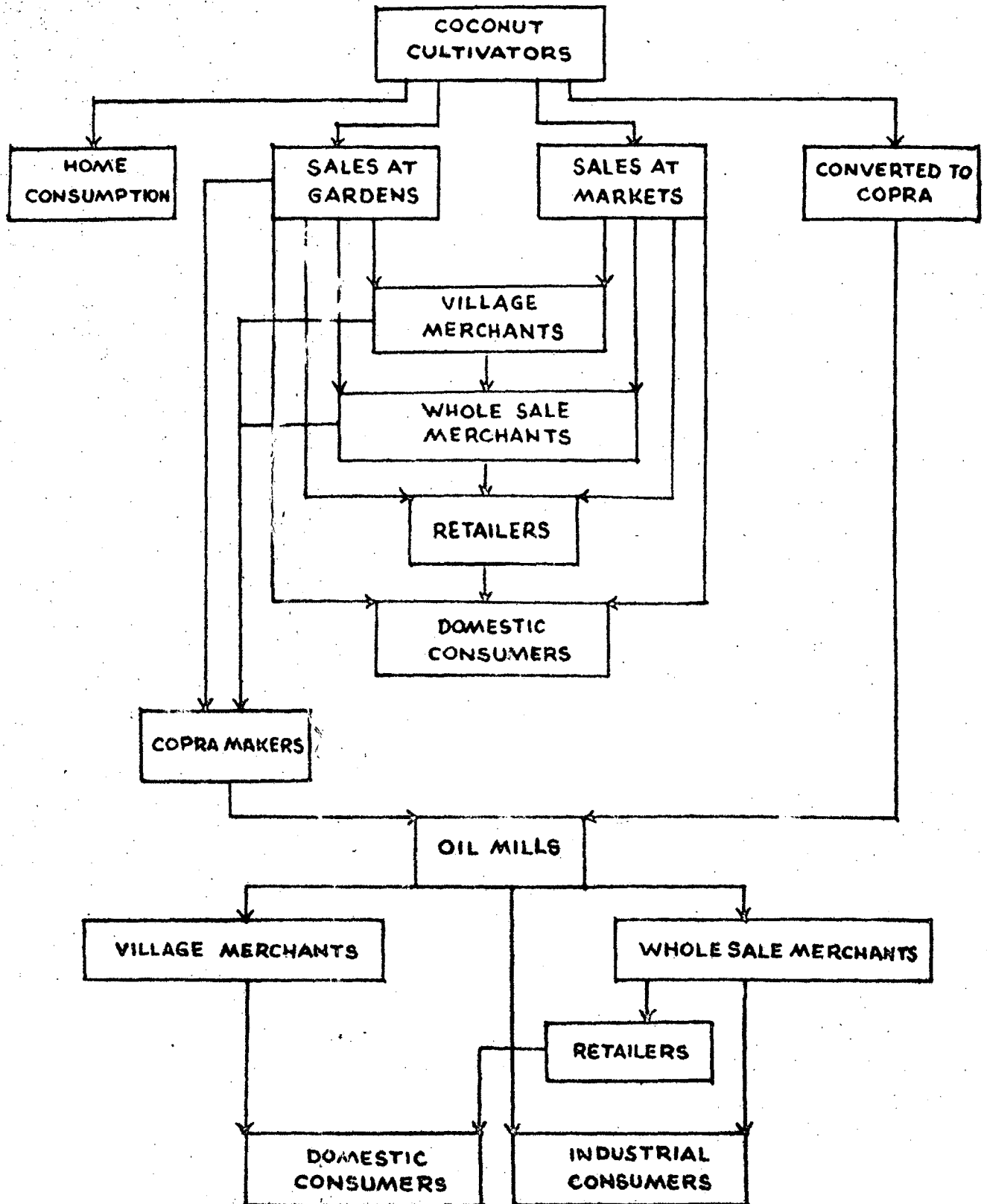
parts of the country. Similarly some of the coconut oil imported from abroad at Calcutta, Madras and Bombay is consumed at these ports and the rest sent, mainly by rail to various inland markets. Bombay is the most important centre for coconut oil trade both for imports and exports, whereas Kerala and Tamil Nadu are the main exporting blocks.

A general idea about the market structure for coconuts and coconut products can be had from Fig.1. Trade in coconuts is monopsonistic in nature, there being a large number of cultivators to sell their produce and only a few village merchants and wholesale merchants acting as the agents of the millers. Thus the poor cultivators are not in a good bargaining position. Similarly the trade in coconut oil is also controlled by a handful of traders, most of whom are the millers themselves, whereas the retail market for coconut oil is spread all over the country. In the absence of a good number of traders at the wholesale level, competition is weak and prices are not always determined on the basis of supply-demand relationships.

1.6 Scope of the present study

As we have seen Kerala accounts for about two-thirds of the total production of coconuts in the country and a sizable portion of it is exported to other States, in the form of copra and coconut oil. Since the growers are mostly small peasants, large in numbers, and about one-third of the State's agricultural income is derived from coconuts, the factors determining the price structure of coconuts and coconut products are of importance not only to the State as a whole but also to levels of income of poor cultivators.

Fig. 1. Market structure for Coconuts and Coconut products



The present study is undertaken mainly to examine the trends in the prices of coconut products since the 1950's and the underlying factors. The relationship between the prices of coconut, copra and coconut oil in some of the important markets has been studied and an attempt is made to explain the price movements in a supply-demand framework. The intra-State variations in the prices of coconut products in Kerala, which is the major producing State, have also been examined briefly. Besides these, seasonal changes in prices have been discussed in the light of the production cycle of the crop and the rainfall pattern in the State. Finally some remarks are made on the impact of these seasonal variations on the coconut growers and traders.

Chapter 2

LONG-TERM MOVEMENTS IN PRICES IN SELECTED MARKETS

2.1 Prices of Coconuts in relation to prices of copra and coconut oil

Alleppey, Cochin and Calicut are among the important markets for coconuts and coconut products in Kerala. Bombay and Calcutta are the two important markets for coconut oil, outside the State.

In Table 2.1 has been presented the data for wholesale prices of coconuts (with husk), copra (dried) and coconut oil (clean, ready) at Calicut market, for the period 1950 to 1977 (see also Fig. 2).

Coconut oil being the end product, if we consider its price as the independent variable, the following mathematical relationship could be obtained for the prices of coconuts and copra.

$$\begin{aligned} (i) \quad Y_1 &= 7.96 + 0.0039 X_1 & R^2 &= 0.99153 \\ & \quad (0.014968)^1 \\ (ii) \quad Y_2 &= 7.26 + 0.6324 X_1 & R^2 &= 0.99898 \\ & \quad (0.023455)^1 \end{aligned}$$

where X_1 represents the whole^{sale} price of coconut oil and Y_1 and Y_2 are the wholesale prices of coconuts and copra. (Figures in parenthesis denote the standard errors of the regression coefficients).

From the above equations, it can be seen that the wholesale prices of coconuts and copra were moving in close sympathy with that of coconut oil (this is the impression conveyed by Figure 2 also) and most of the variations in the prices of coconuts/copra could be explained by the variations in the prices of coconut oil. This is generally true of prices in the other two markets, viz. Alleppey and Cochin for which some data are available on the prices of nuts and copra as well as oil.

Fig. 2. Average annual whole sale prices of Coconuts,
Copra and Coconut oil at Calicut market
(1950-1977)

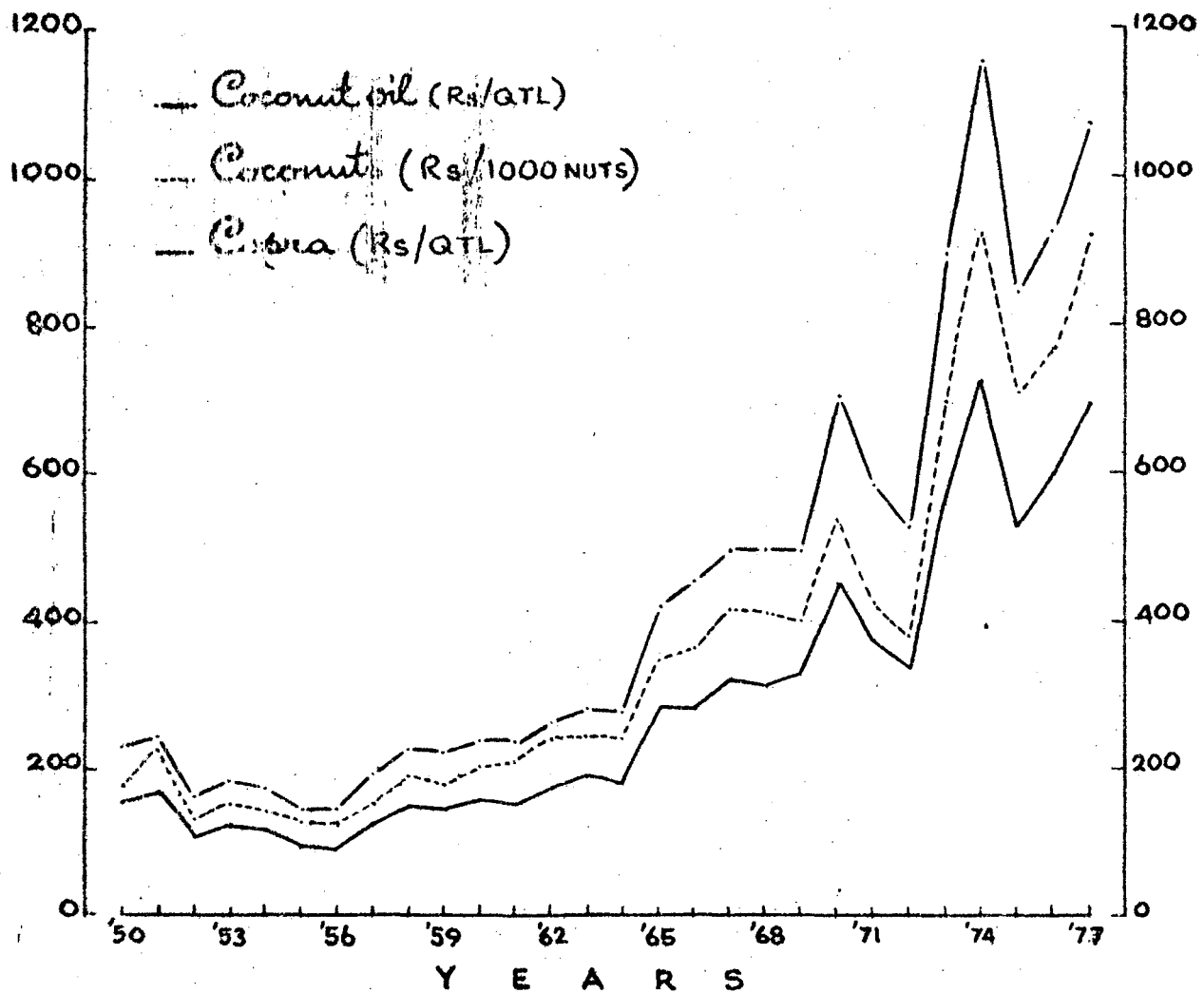


Table 2.1

Average Annual Wholesale Prices of Coconuts and Coconut Products at Calicut (1950-1977)

Year	Coconuts (Rs./1000 nuts)	Copra (Rs./quintal)	Coconut Oil (Rs./quintal)
1950	179	152	229
1951	242	164	244
1952	133	110	164
1953	152	125	185
1954	144	118	175
1955	128	98	143
1956	128	95	148
1957	154	128	193
1958	190	150	230
1959	185	149	226
1960	205	158	240
1961	215	155	236
1962	247	177	264
1963	249	195	284
1964	242	183	277
1965	351	287	422
1966	366	285	456
1967	417	322	498
1968	411	315	497
1969	397	331	497
1970	543	456	702
1971	424	371	581
1972	374	335	521
1973	689	557	864
1974	923	730	1153
1975	708	527	846
1976	764	601	931
1977	921	694	1072

Sources: (i) "Report on the marketing of coconut and coconut products in India" (1962) for the data upto 1960.
(ii) Bureau of Economics and Statistics, Kerala, Trivandrum, for the data since 1960.

2.2 Comparison of Prices of Coconut Oil in different markets

Annual average wholesale prices of coconut oil at Cochin, Alleppey, Calicut and Bombay markets, during the period 1950 to 1976 have been presented in Table 2.2. In view of the close relationship observed between the prices of oil on the one hand and nuts and copra on the other within the same market (see section 2.1), it is

Table 2.2

Average Annual Wholesale Prices of Coconut oil at
different markets

(Price: Rs./Quintal)

Year	Cochin	Alleppey	Calicut	Bombay
1950	223	223	229	250
1951	235	234	244	241
1952	162	158	164	204
1953	178	179	185	190
1954	165	166	175	166
1955	138	139	143	148
1956	138	140	148	152
1957	173	179	193	188
1958	218	217	230	231
1959	222	212	226	230
1960	238	235	240	248
1961	234	233	236	254
1962	261	259	264	273
1963	277	282	284	290
1964	268	274	277	289
1965	412	423	422	448
1966	443	443	456	467
1967	487	483	498	519
1968	488	484	497	519
1969	490	487	497	524
1970	686	684	702	730
1971	569	564	581	605
1972	514	508	521	555
1973	861	864	864	942
1974	1151	1154	1153	1219
1975	845	839	846	907
1976	935	927	931	1031

Sources: For Cochin, Alleppey and Calicut "Report on the Marketing of Coconuts and Coconut Products" (1963), for the period upto 1960 and Bureau of Economics and Statistics, Kerala, Trivandrum for 1960 onwards. For Bombay - "FAO Production Year Book." (Different issues).

sufficient if we analyse the movements in oil prices and the factors underlying them.

The markets for oil seem to be spatially well integrated. The close inter-relationship in the prices of coconut oil at these markets can be seen from Table 2.3, showing the coefficients of

correlation between the prices at different pairs of markets.

Table 2.3

Coefficients of correlation between the prices of coconut oil at different pairs of markets during 1950-1956

		Wholesale price of coconut oil at		
		Alleppey	Calicut	Bombay
Wholesale price of coconut oil at	Cochin	0.999978	0.999861	0.998778
	Alleppey		0.999027	0.998594
	Calicut			0.998571

While the Alleppey and Cochin market prices were always on par, with Bombay prices were always higher by 5 to 10 per cent and this is possibly because of the freight charges involved in the transportation of the commodity from the producing centres in Kerala and other places. The Calicut prices were also slightly higher than the prices at other Kerala markets and this was probably due to its nearness to the upcountry markets. These latter differences were of the order of 4 to 5 per cent during the 1950's and they have come down to less than 3 per cent from the middle of 1960's, because of the better and quicker transport facilities now available from Cochin.

2.3 General trends in the movement of prices of coconut oil

It can be seen from the data in Tables 2.1 and 2.2 as well as Fig.2 that for analysing the price trends, the period 1950 to 1977 can be conveniently broken up into three sub-periods: (i) 1950 to 1956, (ii) during which the prices of coconuts as well as related products declined in a fairly continuous manner; (ii) 1956 to 1965, during which

the prices generally increased with moderate fluctuations, and (11) 1965 to 1973, during which prices not only increased very sharply but also tended to fluctuate more widely than in the preceding period.

It would be interesting to examine the factors responsible for the sharp increase in prices during the last of the above three phases. We shall later see, however, that the differential behaviour of prices in the three sub-periods is explained to a large extent by the same set of factors.

Apart from the sharp increase in prices in the last phase, fluctuations in the prices of coconut oil within the year have also increased (See Table 2.4). Generally speaking, the highest price in any year was received during the period November to January whereas prices tended to decline during the peak monsoon months (June-July) or the months immediately preceding it. The difference has tended to increase somewhat, since 1973.

We thus see that the period under consideration is characterised by differential trends in prices as well as some changes in the seasonal variations in prices. We now turn to factors underlying ^{the} trend in prices and shall deal with seasonal fluctuations in Chapter 4.

2.4 Determinants of the price of coconut oil

Since the production of coconut involves large investment and long gestation period, stability in coconut prices is necessary to promote long term investment for the development of the crop. Further stability in prices is important for the consumer, as coconut products constitute a major item of consumption of the all sections of the population in Kerala, over 80 per cent of the coconut oil consumed

Table 2.4

Wholesale price of coconut oil at Cochin (1963-1977) -
Maximum and Minimum prices quoted within the year

Price: Rs./Quintal

Year	Minimum price		Maximum price		Difference	
					Actual	Percentage
1963	261	(June)	306	(Feb.)	45	17.2
1964	240	(May)	311	(Dec.)	63	25.4
1965	314	(Jan.)	534	(Nov.)	220	70.1
1966	414	(June)	492	(Jan.)	78	18.8
1967	415	(Apr.)	604	(Nov.)	189	45.5
1968	438	(June)	600	(Jan.)	162	37.0
1969	407	(May)	644	(Dec.)	237	58.2
1970	559	(Mar.)	777	(Octo.)	218	39.0
1971	515	(Dec.)	701	(Jan.)	186	36.1
1972	440	(May)	583	(Nov.)	143	32.5
1973	576	(Jan.)	1268	(Dec.)	692	120.1
1974	1061	(Mar.)	1281	(Jan.)	220	30.7
1975	717	(Jul.)	1095	(Jan.)	378	52.7
1976	733	(Mar.)	1354	(Dec.)	621	84.7
1977	940	(June)	1291	(Jan.)	351	37.3

Note: The month to which the price refers to has been given in parentheses.

Source of basic data: Bureau of Economics and Statistics, Trivandrum.

in the State being used for edible purposes. Therefore, an attempt has been made here to identify the factors that determine the prices of coconut products in the country, within the supply-demand framework.

From the analysis in sections 2.1 and 2.2, it is evident that the markets for coconut products are well integrated. The prices of coconuts, copra and coconut oil are found to move together very closely.

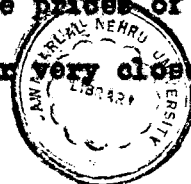
DISS
338.436413461
M4219 Tr



TH241

XX

1H-241



Similarly, between markets also, there is strong association. In view of this close relationship between the prices of different coconut products and the prices at different markets, further analyses are restricted to the price of the product alone, viz. coconut oil, which is the end product, and that too, for Cochin market alone. In this chapter, we shall treat this price as a proxy for the all-India price (data on which were not readily available for the whole period analysed in this study). In the next chapter, however, we shall analyse the movement of all-Kerala prices.

The supply of coconut oil can be expected to be relatively price inelastic for the following reasons: (a) The pre-bearing period of the crop is long (about 5 to 8 years) and so is the time taken (2 to 3 years) for the manifestation of the beneficial effects of better management practices on yield of nuts. (b) Coconut oil cannot be stored or hoarded for too long, as it becomes rancid. Thus, whatever be the supply, the demand has to adjust and the equilibrium brought about through changes in the price of the commodity, rather than quantities. There is dearth of information on the demand for coconut oil, both in the domestic and industrial sectors. Thus, it would be very much appropriate to consider price of coconut oil as the dependent variable and supply/demand factors, viz., per capita production of coconuts, per capita imports of copra/coconut oil, per capita real income and per capita production of major oilseeds, as the independent variables in the price equations. One more independent variable has been added, viz., time 't', to represent the net effect of factors left out.

The data used for regression analysis (both simple and multiple) have been presented in Table 2.5.

Table 2.5
Data used for the regression analysis

Year	Coconut	Imports per capita		Per	Per	Per	t	
	production percapita	Copra	Coconut oil	Copra, co- conut oil & coconuts (in terms of copra)	capita availa- bility (produc- tion + imports) (in terms of copra)	capita production of major oilseeds		capita Real Income (1960-61 prices)
	(nos.)	(gms.)	(gms.)	(gms.)	(gms.)	(gms.)	(Rs.)	
1950	9.83	24.5	51.0	107.2	1559	14.52	258.0	0
1951	9.89	32.3	84.1	168.3	1629	14.01	260.9	1
1952	10.96	52.9	56.7	147.0	1765	13.21	266.5	2
1953	12.16	82.4	63.8	186.3	1982	13.43	277.5	3
1954	11.83	174.1	68.8	272.8	2019	15.37	279.1	4
1955	11.07	213.2	57.4	306.4	1941	15.55	279.1	5
1956	10.82	251.3	53.3	337.5	1935	15.21	287.3	6
1957	10.89	310.1	34.9	366.5	1974	15.67	278.6	7
1958	10.91	237.5	11.3	255.7	1867	16.47	291.9	8
1959	11.01	212.5	6.6	223.2	1849	16.36	291.0	9
1960	10.83	229.6	2.4	233.4	1832	15.64	305.6	10
1961	10.31	200.4	-	200.4	1723	16.12	309.2	11
1962	10.48	202.6	6.8	213.6	1761	16.20	308.2	12
1963	10.54	185.2	5.7	194.3	1750	15.72	318.3	13
1964	10.35	158.7	0.2	159.0	1687	16.62	335.1	14
1965	10.44	100.9	0.3	101.4	1643	15.50	311.0	15
1966	10.37	68.6	-	68.6	1600	13.00	307.4	16
1967	10.43	46.4	-	46.4	1586	14.61	325.4	17
1968	10.54	34.6	-	34.6	1591	14.70	327.0	18
1969	10.82	42.4	-	42.4	1640	13.83	340.6	19
1970	11.07	29.9	2.7	34.3	1669	15.77	353.0	20
1971	11.07	14.8	-	14.8	1649	16.34	349.0	21
1972	10.78	15.9	-	15.9	1608	13.87	337.1	22
1973	10.32	2.2	-	2.2	1526	13.68	349.1	23
1974	10.08	0.1	-	0.1	1488	14.69	343.2	24
1975	10.10	-	-	-	1491	15.28	366.2	25
1976	9.81	4.3	-	4.3	1453	14.56	363.8	26

Note on Table 2.5:

- (1) Coconut Production figures are available on the basis of agricultural years only. Two consecutive figures have been averaged to get the data on calendar year basis. Thus the production figure for 1950 has been taken as the average production for 1949-50 and 1950-51, and so on.

Notes of Table 2.5 (Contd..)

- (ii) Mid-year all-India population figures, available in "Statistical Abstract - India" published regularly by C.S.O., New Delhi has been made use of for calculating the per capita production/imports.
- (iii) Import figures are available on financial year basis only. The import shown against 1950 actually represents the imports for 1950-51 and so on.
- (iv) Total import/availability figures have been expressed in terms of copra, by using the following conversion factors:
- Coconuts to copra, one ton of copra = 6775 nuts
Coconut oil to copra crushed = 62 per cent
- (Ref: "Indian Agriculture in Brief", Eleventh Edition, DES, Ministry of Agriculture, 1971, Appendix I).
- (v) Major oil seeds: Groundnut, rapeseed and mustard, sesamum, castorseed and linseed.
- (vi) Real Income: Figures are available on financial year basis only. Data for the period from 1960-61 onwards have been taken from the "National Accounts Statistics" various issues. Data for the period prior to 1960-61, available in "National Income of India: Trends and Structure" - M. Mukherji (Statistical Publishing Society, Calcutta) (1969) at 1948-49 prices have been suitably deflated. Similarly the data for 1975-76 and 1976-77, available at 1970-71 prices, have also been suitably adjusted.
- (vii) Data for the dependent variable: wholesale price of coconut oil at Cochin - has been presented in Table 2.2.
- (viii) Production figures for coconuts and major oil seeds have been taken from "Estimates of Area and Production of Principal Crops, 1975-76" (DES, Ministry of Agriculture, New Delhi (1977)). Data for 1976-77 have been taken from the different issues of "Agricultural Situation in India" (DES, Ministry of Agriculture, New Delhi).
- (ix) Import figures, for the period upto 1962-63 have been taken from the "Report on the Marketing of Coconuts and Coconut Products" (Directorate of Marketing and Inspection, Nagpur) (1965) and for the period 1963-64 to 1968-69, from different issues of "Bulletin on Commercial Crop Statistics". Data for the subsequent years have been taken from the various issues of "Coconut Bulletin" (Directorate of Coconut Development, Cochin).

Table 2.6 (a) and (b) gives the price equations for Coconut oil, showing constant terms, regression coefficients for the variables, with their standard errors and R^2 values.

Table 2.6
 Estimated Price Equation for the Wholesale
 Price of Coconut Oil at Cochin
 (Period: 1950-1976)

(a) Simple Linear Regression Analysis

Independent variable	Constant term	Regression Coefficient	S.E. of Coeff.	R^2
1. Per capita production of coconuts	3025.26	-242.6243*	97.4220	0.1988
2. Per capita imports of copra	672.05	-2.160749**	0.4347	0.4970
3. Per capita imports of coconut oil	551.47	-6.164293**	1.8189	0.3147
4. Per capita imports of copra, coconuts and coconut oil (in terms of copra)	119.42	-2.300431**	0.2505	0.7712
5. Per capita availability (internal production of coconuts + imports of copra, coconuts and coconut oil) (in terms of copra)	2704.32	-1.422289**	0.2239	0.6173
6. Per capita production of five major oil seeds	1342.09	-60.149534	54.4162	0.0466
7. Per capita real income at 1960-61 prices	-1922.0375	7.567913**	1.0563	0.6724
8. t	11.5397	32.787545**	3.6421	0.7642

*significant at $P = 0.05$ **significant at $P = 0.01$

(b) Multiple Regression Analysis

Sl. No.	Constant term	Least square estimates of coefficients of				R ²
		Per capita production of coconuts	Per capita Imports of copra, coconut oil & coconuts (in terms of copra)	Per capita availability (internal production + imports, in terms of copra)	Per capita Real Income at 1960-61 prices	
1.	1335.639	-55.8158 (88.9302)	-2.1901** (0.3918)			0.7801
2.	-445.877		-1.5683** (0.3712)	3.5299* (1.3473)		0.8395
3.	383.677		-1.3169** (0.3008)		18.1795** (4.4421)	0.8653
4.	124.165		-2.4624** (0.2606)			43.5298 (28.2509)
5.	255.024			-0.7935* (0.3461)	4.9458* (1.9428)	0.7839
6.	1173.568			-0.6107 (0.3359)		23.8761** (8.2678)
7.	1122.516		-1.2737** (0.3068)		2.8812 (2.8368)	30.0219* (12.4453)
8.	-411.133		-1.5086** (0.4346)		3.7022* (1.4119)	-6.4302 (31.6876)

* Significant at P = 0.05 ** Significant at P = 0.01

(Numbers in parentheses are the standard errors of the coefficients)

Let us consider the results of the price equations presented in Tables 2.6 (a) and (b). Among the different variables considered, per capita imports into India of copra, coconut oil and coconuts (total, in terms of copra) has turned out to be the single most important factor influencing the price behaviour of coconut oil.^{1/} Nearly 77 percent of the variations in prices of coconut oil was found to be explained by the variations in per capita imports alone.^{2/} We can now see that the differential behaviour in price movements in the three sub-periods, referred to earlier, is to a large extent explained by trends in imports. Imports of copra and coconut oil (in grams per capita of copra equivalent) steadily increased from 107.2 in 1950 to 366.5 in 1957, bringing a steady decline in the prices during this period; they have declined thereafter to 101.4 in 1965 and reduced practically to a trickle in recent times (Table 2.5); the moderate increase in price during 1957 to 1965 and the very sharp increase thereafter can thus be attributed to the decline in imports.

Per capita production of coconuts in the country was found to have had only limited influence on coconut oil prices. When this variable was considered alone, it could explain only 20 per cent of the variations

1/ When the imports of copra and coconut oil were considered separately in single variable regressions, R^2 values were not high, though both the regression coefficients were significantly high at one per cent level. It is necessary to consider the import of copra and coconut oil together, as imported copra is also meant for crushing to extract oil. Since 1955 onwards, there has been decline in oil imports, but during the immediately succeeding years, this was compensated by increased imports of copra.

2/ Thampan P.K. and Pankajakshan A.S. (1976): "Coconut Oil in India: Its Price behaviour in the last decade", "Coconut Bulletin", vol.7, nos. 6 & 7. It has been stated here that stoppage of import of coconut oil alone by itself have only little influence on the price behaviour. The present study contradicts this result.

oil in/prices and when it was considered along with per capita imports of copra, coconuts and coconut oil, its coefficient turned out to be non-significant. This is not unexpected, because coconut is a deficit crop, as far as our country is concerned. Hence, marginal changes in production cannot be expected to exercise any influence on the prices; in fact production trends have been steady in contrast to wild fluctuations in prices. Thus, prices are to a large extent determined by excess demand as reflected in the quantum of imports.

Per capita real income at 1960-61 prices was another factor which had significant influence on the movement of coconut oil prices. We can thus see that demand factors have also exerted some influence on price trends.

When the total availability of coconuts in the country (that is, internal production plus imports) was considered as a variable in this analysis (as an alternative to production), R^2 was only 0.6173. But, when internal production and imports were considered separately, R^2 went up by about 17 per cent (Table 2.5 (b)).

Curiously enough, the per capita production of the major oil-seeds (groundnut, linseed, rapeseed and mustard, sesamum and castorseed) had no influence on coconut oil prices. This may be because of the limited substitutability of coconut oil by these oils, mainly in the edible oil sector, due to the differential tastes and food habits of the population (Table 2.6 (a)). Further, it may be excess demand, rather than production, of oil seeds in general, which exerts a strong influence on prices (see section 2.5).

The variable 't' representing miscellaneous factors was also found to be equally important, as the imports of coconut products, in influencing the prices (Table 2.6 (a) and (b)).

Per capita imports of coconut products (in terms of copra) and per capita real income together could explain 84 per cent of the variations in prices of coconut oil. With the introduction of the variable t, along with the above two, R^2 went up to 0.8718. (Table 2.6 (b)).

From the above analysis, it is clear that the fluctuations in the prices of coconut oil cannot be fully explained by levels of production (of either coconut or of all major oil seeds put together) alone. Other factors reflecting the excess demand, such as imports and income influence the price behaviour of coconut oil, to a considerable extent.

2.5 Prices of Coconut oil in relation to the markets for other oil seeds and oils

We have seen that a large part of the variation in coconut oil prices is explained by the trend in imports of copra and coconut oil. However, the markets for different oilseeds (groundnut being the most important one) can be expected to be well integrated since they can be substituted for each other in industrial uses. Further there is considerable international trade in both oil seeds and vegetable oils. We expect these factors to influence the movement of coconut oil prices.

First let us consider the price movements of other edible oils (Table 2.7) and see how well they are related to the price of coconut oil. Table 2.8 gives these correlations. It can be seen that the prices of all other edible oils move very closely to those of coconut oil.

It follows that shortages in the oilseed and oil markets in general will produce impulses in the market for coconut oil. We thus have to reinterpret our results of the last section: the abnormal

Table 2.7

Economic Adviser's Index Numbers of Wholccole Prices (Annual averages)

(Base: 1961-62 = 100)

Mible oilc	Years	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Groundnut oil		86.7	109.7	132.3	190.9	194.3	146.3	204.0	232.0	203.7	209.5
Sesamum		78.0	102.9	123.6	164.6	164.7	131.7	174.5	196.1	185.8	204.5
Mustard oil		105.4	147.3	164.3	185.6	226.4	184.5	200.2	239.0	235.9	251.8
Linseed oil		87.2	111.6	139.1	104.5	231.6	155.8	195.2	238.8	237.4	224.1
Castor oil		98.1	106.0	129.8	199.4	218.3	165.9	175.4	222.9	239.1	225.0
Coconut oil		120.2	110.6	179.6	193.2	206.3	209.3	208.9	209.5	255.7	227.7
Vanaspathi		96.9	111.9	123.6	172.2	167.5	140.0	166.9	190.7	170.9	182.4
Mible oils (group)		95.3	117.9	141.4	185.3	199.2	158.5	195.3	230.0	209.5	214.3

Source: "Bulletin on Commercial Crop Statistics" Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi) - different issues.

rise in prices of coconut oil during the post 1965 period must be attributed to excess demand in the edible oil market in general and not that of coconut oil alone.

As we have already suggested the supply demand imbalances in the edible oil markets, and the consequent price changes, are determined to a certain extent by the inter-national trade in these commodities. A full-scale analysis of these markets is beyond the scope of this study.

Table 2.8

Coefficients of Correlation (r) between the prices of coconut oil and other edible oils (Period: 1963-1972)

Edible oils	Coefficient of correlation with the price of coconut oil
Groundnut oil	0.8980
Sesamum oil	0.8853
Mustard oil	0.8852
Linseed oil	0.8466
Castor oil	0.8832
Vanaspathi	0.7409
Edible oils (group)	0.9276

Table 2.9 shows, however, that India not only imports coconut and other vegetable oils but is also involved in the export of groundnuts as well as vegetable oils. A feature of this trade that is of relevance to us here is that during late 'sixties and later while imports of oilseeds have declined and the imports of oils have fluctuated wildly exports of groundnut and vegetable oils have tended to increase steadily. This could have generated internal imbalances in the oil markets and resulted in sharp price increases of all edible oils.

Table 2.9

Foreign Trade in Edible Oil Seeds and Vegetable Oils
by India

(Quantity: '000 m.tons)

Year	Edible Oilseeds				Vegetable Oils			
	Imports		Exports		Imports		Exports	
	Coconuts, in terms of copra	Total	Groundnut oil	Total	Coconut oil	Total	Groundnut oil	Total
1959	89.97	90.03	27.41	29.27	2.80	31.28	42.17	103.73
1960	99.33	99.35	41.12	42.48	1.03	36.32	1.68	75.05
1961	88.65	88.69	38.77	40.72	..	36.66	1.49	32.72
1962	91.76	92.35	43.25	44.60	3.09	36.20	33.09	68.06
1963	85.55	85.75	34.41	38.07	2.62	39.87	78.53	127.14
1964	74.92	80.51	36.62	37.47	0.08	36.81	58.49	96.86
1965	48.70	54.04	0.23	0.93	0.15	67.20	0.02	24.05
1966	33.86	40.13	0.25	0.79	..	44.43	1.14	14.03
1967	23.38	30.57	0.31	0.89	..	60.04	0.01	13.30
1968	17.83	24.42	20.88	21.53	..	37.64	0.06	47.38
1969	22.32	27.52	38.40	40.15	..	84.36	0.06	23.17
1970	16.09	20.38	25.83	26.34	1.47	84.08	0.18	24.80
1971	8.13	96.40	28.48	29.32	..	77.99	0.06	20.57
1972	8.94	44.13	25.32	28.25	..	67.60	0.10	47.88
1973	1.27	79.19	30.72	35.70	..	153.24	0.08	50.41
1974	0.05	34.03	88.22	95.54	..	72.87	0.07	54.42
1975	..	18.69	70.07	101.81	..	30.22	0.08	76.05

Source: "Bulletin on Food Statistics" -
different issues

The extent to which international trade influences price movements by integrating world markets can be gauged by the price movements of coconut oil in such widely different markets as Bombay, Manila (Philippines) and Colombo (Sri Lanka) (See Fig. 3 and Table 2.10, for the data). We see in particular that the sharp rise in prices during the 'seventies is a feature of important coconut oil markets the world over.

The edible oil markets all over the world thus appear to be well integrated and shortages can quickly propagate their effects to the domestic coconut oil market and consequently to the coconut market itself.

Table 10
Prices of Coconut Oil in World Markets
(Price: US \$/100 kg.)

Year	India	Philippines	Sri Lanka
1950	52.5	34.0	29.1
1951	50.6	35.0	33.4
1952	42.8	23.0	20.1
1953	39.9	34.5	26.4
1954	34.9	28.5	23.1
1955	31.0	24.0	19.5
1956	31.9	22.5	20.2
1957	39.4	23.5	21.3
1958	48.6	32.5	25.3
1959	48.3	40.0	30.6
1960	52.0	31.8	23.9
1961	53.3	24.6	18.5
1962	57.3	23.0	18.5
1963	60.9	25.1	21.3
1964	60.6	27.4	22.5
1965	84.0	31.4	26.2
1966	77.7	25.2	24.1
1967	69.2	27.9	23.3
1968	69.2	33.3	24.9
1969	69.9	29.0	24.0
1970	97.4	43.3	24.9
1971	80.7	38.5	23.3
1972	72.6	17.9	18.0
1973	121.3	45.6	22.8
1974	150.5	95.2	56.0
1975	108.3	36.6	29.0
1976	115.1	38.7	34.4

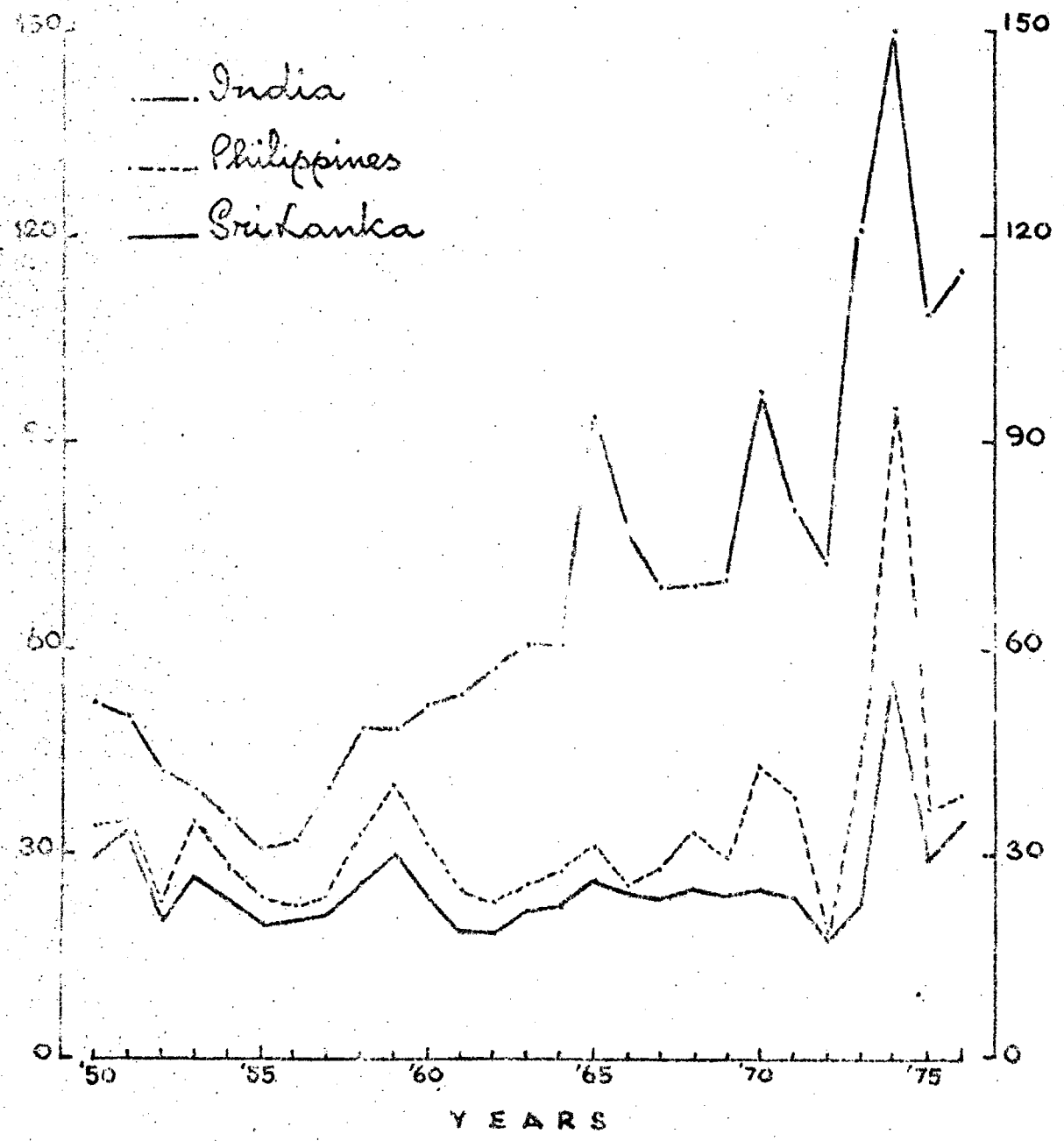
Note: India - Wholesale price, Bombay.

Philippines - Wholesale price, Manila.

Sri Lanka - Export prices, delivered to wharf, Colombo.

Source: FAO PRODUCTION YEAR BOOK. (Rome) different issues.

Fig. 3. Price of Coconut oil (u.s. \$/100 kg.) in world markets



Chapter 3

PRICE TRENDS IN KERALA

3.1 Economic Importance of the crop to the State

We have seen that Kerala accounts for nearly 65 per cent of the area under the crop in the country and about 60 per cent of the total production (section 1.1). During 1975-76, 6.95 lakh ha. were under coconuts and this was about one-third of the net cropped area in the State. No other crop is grown to such a large extent. The share of the crop in the agricultural income of the State is over 30 per cent.^{1/} The coconut crop thus occupies a place of unique importance in the economy of the State.

Before considering the price trends, we shall take a brief look at trends in production and productivity. During the period 1957-58 to 1974-75, the area under coconut in the State was increasing at the compound annual rate of 3.26 per cent, whereas the production of nuts was growing at the rate of 1.38 per cent only. The productivity of palms was declining at the rate of 1.66 per cent per annum. This declining trend in productivity was partly due to the method of calculation. When productivity is expressed in terms of yield of nuts per hectare, palms in both bearing and pre-bearing stages are considered together. When the number of palms added increases at a higher rate compared to the palms removed the proportion of bearing palms in the population comes down and this indirectly has brought down the productivity also. Since

^{1/} "Distribution of Agricultural Income in India, 1960-61 and 1970-71" - Majumdar A.G. (Economic and Scientific Research Foundation, New Delhi) (1972.) The Estimated production during 1970-71 was 3981 million nuts and the share of the crop in the agricultural income of the State was 34.6 per cent. The actual share may be little less than this because crops like tea, coffee and rubber have not been included in this study.

the increase in prices of coconuts have always been higher than that of other crops, the area under coconuts was also increasing at a higher rate. In this process, marginal lands have also been brought under cultivation. This is another reason for the declining trend in productivity. The prevalence of a root (wilt) disease has also affected the productivity of palms.^{2/}

3.2. Determinants of the price of coconut oil in Kerala

In the last chapter we had analysed the price movements/ⁱⁿ selected markets. In the present one, we shall be concerned with trends of prices in Kerala. There we had treated the Cochin price as essentially a proxy for the all-India price and related it to demand and supply factors at the all-India level. We showed that imports of copra and coconut oil and levels of income are two of the most important determinants of prices. Since Kerala is a net exporter of coconuts and coconut products, the quantum of export of these commodities can be expected to largely determine the variations in prices in the State. However, this line could not be pursued further, due to non-availability of reliable data. According to the estimates prepared by the Directorate of Coconut Development, Cochin (see section 1.4), only about 50 per cent of the total production of 2.94 lakh tons of milling copra produced in the State is utilised for crushing in local milling sector and the balance is transacted in other States. The quantity of copra thus sent out of the State is the equivalent of about 1000 million nuts. Similarly, production of coconut oil in the State is estimated to^{2/} be of the order of 95,000 tons, of which about 35,000 tons is marketed outside the State. In terms of nuts, this is about 380 million

^{2/} Jacob Mathew (1978): "Pattern of Production and Productivity of Coconuts in Kerala" (Paper presented at the First Annual Symposium on Plantation Crops, held at Kottayam, March 1978).

nuts. Current estimates are not available about the quantity of fresh coconuts sent out of the State. During the late 'fifties, coastal trade in coconuts was to the tune of about 110 million nuts^{5/} On this basis we can say that a total of over 1500 million nuts (about 45 percent on the total production in the State) is transacted outside, in one form or another.

"Bulletin on Food Statistics" regularly publishes data on the inland movement of cereals, pulses, oilseeds, etc. by rail and river, trade-block-wise (See Table 3.1). Only coconut oil is listed here and coconuts and copra have been excluded. Similarly, reliable information on the road movement of all these commodities is not available. Administration reports of the Agricultural Income Tax and Sales Tax Department of Kerala do give information on the value of these commodities sent out (contd. on page 38)

Table 3.1

Inland movement (export) of coconut oil from Kerala,
by rail and river

Year (April- March)	Kerala excluding ports (m. tons)	Cochin port (m. tons)	Other Kerala ports (m. tons)	Total Kerala (m. tons)
1964-65	4294	2123	10878	17067
1965-66	1607	2665	10812	15011
1966-67	2518	5461	13134	21102
1967-68	1286	4327	9688	15288
1968-69	2708	6421	10687	19809
1969-70	3788	5570	7094	16399
1970-71	1849	5674	6031	13548
1971-72	3408	5932	9415	18750
1972-73	6745	4272	6724	17738
1973-74	5222	2962	3147	11351
1974-75	3787	1964	1352	7102

Notes: Totals have been arrived at by excluding the inland trade between constituent trade blocks.

Source: "Bulletin on Food Statistics" - different issues.

^{5/}"Report of the Marketing of Coconuts and Coconut Products in India" (Directorate of Marketing and Inspection, Ministry of Food and Agriculture, Nagpur (1962) Appendix XVIII.

of the State (also, brought into the State), through the checkpoints. But these data seem to be totally unreliable because of the sharp variations in figures noticed between years, and hence, not used for this analysis. For example, from Table 3.1 it can be seen that during 1967, 1970 and 1974, when the prices were ruling high in markets outside Kerala (see chapter 2), the quantities exported through rail and river were low. We have no information on road movements, as already mentioned. We cannot, therefore, analyse the relationship between exports and prices in a satisfactory manner. However, the influence of domestic demand and supply factors on prices can be analysed on the basis of existing data.

Coconuts and coconut products form an important part of the diet of the Keralites. They also use it for massaging the body and for dressing the hair. According to the estimates prepared by the Directorate of Coconut Development, Cochin, 30 per cent of the total production of coconut oil in the country is consumed in the household sector in Kerala (see section 1.4). Accordingly, in the price equations, the average annual wholesale price of coconut oil was taken as the dependent variable and per capita production of coconuts in Kerala, per capita real income in Kerala and time "t" as the independent variables. Data used for regression analysis and the results of regression analysis have been presented in Tables 3.2 and 3.3 respectively.

All the three variables considered were found to have significant influence on the price behaviour of coconut oil. Per capita production of coconuts in Kerala and per capita real income in the State together could explain nearly 90 per cent of the variations in prices of coconut oil. We thus see that while the levels of production in the country as a whole do not influence price changes (see section 2.4), output variations

Table 3.2
Data used for regression analysis

Year	Wholesale price of coconut oil (Rs./quintal)	Per capita pro- duction of coconuts (#bs.)	Per capita real income (Rs.)	t
1960	233	197.6	259	0
1961	234	189.6	256	1
1962	261	187.6	260	2
1963	280	183.6	259	3
1964	271	178.8	264	4
1965	417	175.6	261	5
1966	454	175.4	268	6
1967	490	183.2	280	7
1968	494	185.3	286	8
1969	497	189.9	292	9
1970	696	189.1	298	10
1971	579	187.1	304	11
1972	520	181.5	304	12
1973	868	169.6	301	13
1974	1143	152.6	299	14
1975	874	152.3	297	15

- Notes: (i) Wholesale price of coconut oil in Kerala has been taken as the simple average of district-wise figures. Basic data was collected from the publications of Bureau of Economics and Statistics, Trivandrum.
- (ii) To obtain the production figures on calendar year basis, averages of the data available in agricultural year basis have been taken. Population figures have been computed from the Census figures for 1961 and 1971, assuming constant compound growth rate.
- (iii) Per capita real income, at 1960-61 prices, have been taken from the publications of Bureau of Economics and Statistics, Trivandrum.

Table 3.3

Estimated Price equations for the wholesale
price of coconut oil in Kerala

(Period: 1960-1975)

Sl. No.	Constant term	Least square estimates of coefficients of		R ²
		Per capita pro- duction of coco- nuts in Kerala	Per capita real income in Kerala	
1	3391.525	-15.9626** (3.5327)		0.5928
2	-2575.543		11.0338** (2.2621)	0.6296
3	144.956		49.9309** (6.3057)	0.8175
4	278.731	-11.3729** (2.0063)	8.1532** (1.3458)	0.8876
5	1353.362	-6.2538* (2.6972)	38.8378** (7.1846)	0.8681
6	1649.904		-5.9574 (4.2260)	72.0784** (16.7823)

*Significant at P = 0.05. ** significant at P = 0.01

(Numbers in parentheses are the standard errors of the coefficients).

do explain price trends in Kerala to a large extent. This cannot be satisfactorily explained in terms of our simple formulations. For a fuller analysis, it would be necessary to examine the simultaneous determination of Kerala's domestic consumption, exports and prices (which appear to be uniform everywhere) for given levels of domestic production and deficits in the edible markets elsewhere. Such an analysis is not attempted here for want of reliable data on Kerala's exports of copra and coconut oil, as already remarked.

3.3 Intra-State variations in price

Coconut is grown in all the eleven revenue districts of Kerala (See Table 3.4). Except in the two interior districts, viz. Idukki and Palghat, the crop is more-or-less equally distributed in the remaining districts. Calicut district is the largest producer of coconuts in the State, accounting for about 15.2 per cent of the total production, followed by Quilon (14.1%) and Trivandrum (12.5%) districts (Table 3.4).

Table 3.4

District-wise area and Production of coconuts
in Kerala State

(Year: 1975-76)

District	Area ('000 ha.)	Production (million nuts)
Trivandrum	74.07 (10.7)	428 (12.5)
Quilon	98.07 (14.1)	485 (14.1)
Alleppey	72.82 (10.5)	404 (11.7)
Kottayam	58.17 (8.4)	288 (8.4)
Idukki	11.47 (1.7)	61 (1.8)
Ernakulam	50.73 (7.3)	269 (7.8)
Trichur	50.70 (7.3)	299 (8.7)
Palghat	16.99 (2.5)	56 (1.6)
Malappuram	70.27 (10.1)	311 (9.0)
Calicut	97.45 (14.1)	523 (15.2)
Cannanore	92.20 (13.3)	315 (9.2)
Kerala State	692.95 (100.0)	3439 (100.0)

Note: Figures in parenthesis show the area/production expressed as percentage of the State total)

Source: "Statistics for Planning" (Bureau of Economics & Statistics, Trivandrum (1977)).

An attempt has been made here to study the inter-district variations in prices of coconut oil and coconuts. Only six revenue districts were considered for this study. Trivandrum district had to be excluded because price data for coconut oil are not available for this district. The other districts had to be excluded because of the changes that have taken place in their geographical area, with the formation of new districts. The study was confined to two periods of time, viz. 1959 to 1964 (Period 1) and 1971-76 (Period 2). During Period 1, though the prices were slowly rising, it was devoid of wide year to year fluctuations. Period 2 was conspicuous for the violent fluctuations in prices. Thus in both the periods, data for six districts were used for this study. Results of an analysis of variance have been presented in Table 3.5 (a) and (b) (See also Fig.4). The following points have emerged out of this analysis:

(i) Coconut Oil:

During period 1, the inter-district variation in prices of coconut oil was significant at 5 per cent level. During Period 2, these differences narrowed down and were not statistically significant. The absence of inter-district variations in prices in oil is not unexpected in the light of our earlier finding that the oil markets are well integrated. At Alleppey and Calicut, which are the two important markets for coconut oil, catering to the needs of the upcountry buyers, the prices were generally higher. During Period 1, the prices at Trichur and Alleppey were on par. But during Period 2, the average price at Alleppey was the highest and that at Trichur, the lowest, among the districts considered. This is probably due to the abundant supply of coconut oil at Trichur District during the latter period, consequent on the setting up of many expeller units there, for the extraction of oil.

Table 3.5
Inter-district variations in prices of coconut oil
and coconuts

(a) Summary of ANOVA Table

Source	d.f.	Period 1: 1959-1964		Period 2: 1971-1976	
		N.S.S.	F	N.S.S.	F
(i) Wholesale price of Coconut oil (Rs./qtl.)					
Due to years	5	3546.04		324459.11	
Due to districts	5	23.08	3.23*	1492.45	2.28
Residual	25	7.152		653.191	
(ii) Wholesale price of coconuts with husk (Rs./1000 nuts)					
Due to years	5	2539.30		260796.09	
Due to districts	5	574.00	13.56**	30824.69	38.22**
Residual	25	42.328		806.428	

*Significant at P = 0.05 **Significant at P = 0.01

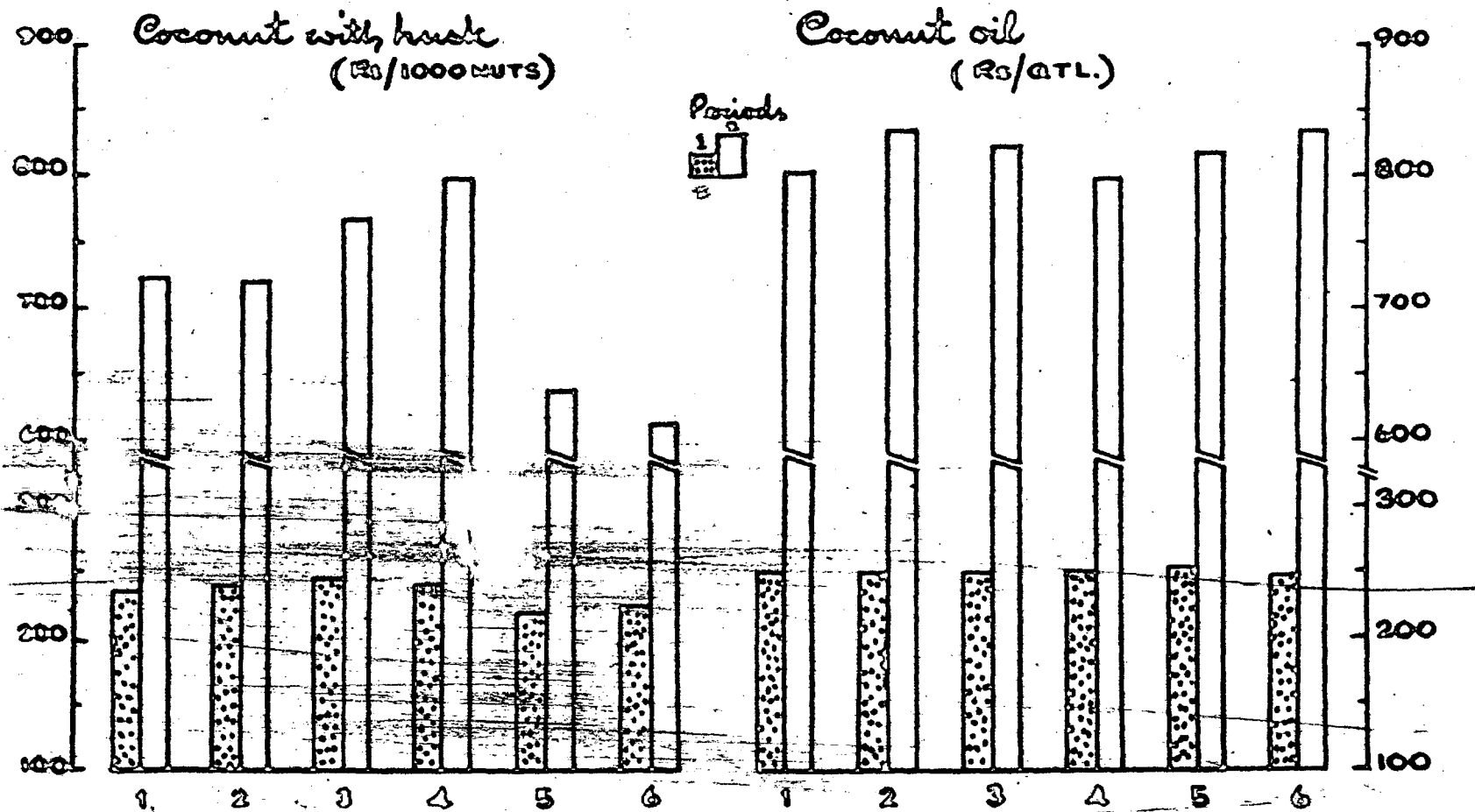
(b) Table of means - average annual wholesale prices

District	Coconut Oil (Rs./Quintal)		Coconut with husk (Rs./1000 nuts)	
	Period 1 (1959-64)	Period 2 (1971-76)	Period 1 (1959-64)	Period 2 (1971-76)
Quilon	249.18	803.21	236.38	722.04
Alleppey	249.90	835.78	239.53	720.30
Ernakulam	248.92	823.72	245.38	766.75
Trichur	249.75	797.71	241.07	797.59
Calicut	253.51	818.97	221.18	638.54
Cannanore	247.72	834.41	223.98	612.88
Gen. mean	249.83	818.97	234.59	709.72
C.V. (%)	1.07	3.12	2.77	4.00

Source of basic data: Bureau of Economics and Statistics, Trivandrum.

Fig. 4. Inter-District variations in average annual wholesale prices in Kerala State.

1. QUILON 2. ALLEPPEY 3. ERNAKULAM 4. TRICHUR 5. CALICUT 6. CANNANORE



(ii) Coconuts:

In contrast to coconut oil prices, inter-district variations in wholesale prices of coconuts (with husk) were statistically significant in both periods, the variations being higher in the latter period. Price of coconuts was highest in Trichur district, during Period 2, possibly due to the heavy demand for the commodity from the oil millers there. Compared to the northern districts (Calicut and Cannanore), the prices were generally higher in the southern districts (Quilon and Alleppey), in both the periods. This is because of the high price coconut husk fetches in these areas. The backwaters of south Kerala are suitable for the retting of the husk, which is required for the coir industry.

Since we do not have data on the inter-district movement of coconuts, it is not possible to analyse the inter-district variations in greater detail. However, the striking fact that emerges from our analysis of the price data is that inter-district variations in the prices of coconuts have tended to increase during the 'seventies, consequent to the sharp increases in the prices of both oil and nuts in all markets. Table 3.6 shows that while the coefficient of variation (inter-district) in coconut oil has remained at a lower level throughout the time period of our analysis, that of coconut prices has increased from about 4-5 percent during late 'fifties to about 8-11 percent during the early 'seventies. It can be seen from the Fig.4 that this has come about through relatively small increases in the northern districts where the prices are usually lower and large increases in southern districts, where the prices are usually higher.

Table 3.6
 Inter-district coefficients of variation (%)
 for wholesale prices of coconut oil and
 coconuts (with husk)

Year	Coconut Oil	Coconuts
1957	1.93	4.67
1958	2.23	5.95
1959	0.80	6.33
1960	1.05	6.38
1961	1.29	5.46
1962	1.41	3.48
1963	0.88	7.56
1964	1.51	6.86
1965	2.26	5.47
1966	3.24	5.71
1967	1.09	9.84
1968	1.10	5.00
1969	0.92	11.49
1970	0.78	3.48
1971	1.76	11.37
1972	1.32	11.03
1973	0.26	11.71
1974	1.61	8.84
1975	1.69	7.29
1976	1.20	9.32

Source of basic data: Bureau of Economics and Statistics,
 Trivandrum.

Chapter 4

SHORT TERM FLUCTUATIONS IN PRICES

4.1 Production cycle of coconuts

Unlike most other agricultural commodities, coconuts are harvested several times a year. From regular bearing palms, a bunch of nuts can be harvested almost every month. The number of nuts plucked at each harvest varies and proportionately more nuts are obtained during summer months. Table 4.1 gives the percentage of total yield obtained in the different months of the year. The month of April has the maximum share of production and the first six months of the year account for about 60 per cent of the total yield. The large harvests during the summer months are due to the combined effects of larger number of yielding trees, larger number of bunches harvested and larger number of nuts per bunch. October has the minimum share of production. It is also reported^{1/} that the nuts harvested during the months of January to May are generally big in size and those harvested during the period from September to November are small. Those harvested in other months are intermediate in size.

4.2 Seasonal Indices for Prices

In Chapter 2, we had discussed the long term trends in the price movements of coconuts and coconut oil and the determinants of the price of coconut oil. Since coconuts are harvested almost every month of the year (and can be stored in husk for many months), prices are not affected very much by the pressure of supplies at any one particular time of the

^{1/} "Report on the Marketing of Coconuts and Coconut Products in India" (Directorate of Marketing and Inspection, Ministry of Agriculture, Nagpur) (1962) Page 31.

Table 4.1

Percentage of nuts harvested in the different months of the year

Month	1	2	3	4	Mean
January	6.4	6.4	7.1	9.0	7.2
February	7.7	8.9	9.6	10.2	9.1
March	9.8	10.8	11.5	12.2	11.1
April	14.1	14.1	11.8	12.1	13.0
May	11.7	11.4	9.3	9.6	10.5
June	9.8	9.7	7.6	9.5	9.2
July	8.2	8.3	8.1	4.7	7.3
August	7.7	7.8	7.7	6.1	7.3
September	6.5	5.9	7.4	6.1	6.5
October	5.6	4.8	6.3	6.2	5.7
November	6.5	6.3	6.2	6.4	6.4
December	6.0	5.6	7.4	7.9	6.7

Notes: Col.1 - Reproduced from "The Coconut Palm - A monograph" - Menon KPV and Pandarai KI (1958). This had been calculated from the monthly records of harvest and yield of nuts ~~maintained~~ maintained for a series of years at CFCRI, Kasaragod, which had at that time over 6000 bearing trees.

Col.2 - Reproduced from the "Report on the marketing of coconuts and coconut products in India", Directorate of Marketing and Inspection, Nagpur (1962). Data presented is the mean of three consecutive years (1951-53) and relates to 141 trees.

Col.3 - Source, same as that of Col.2 above. Data relates to a farm of about 6000 trees, for 1959.

Col.4 - Reproduced from the "Comprehensive Report on the Survey for the correct estimation of area under and production of coconut crop in Kerala, 1962-65" and "Report on the Seventh round of the Sample Survey to estimate the area under $\frac{1}{2}$ and production of coconut crop in Kerala, 1965-66", Bureau of Economics and Statistics, Trivandrum. Data presented is the mean of four consecutive years, 1962-66, and relates to over 4 3500 palms, spread all over the State.

year. In this section, it is proposed to look into the seasonal variations in the wholesale prices of coconuts and coconut oil as well as the farm price of coconuts. The study has been carried out for two periods of time, viz. 1958-59 to 1964-65 (Period 1) and 1970-71 to 1976-77 (Period 2). During the former period, prices were generally lower and devoid of wide fluctuations. During Period 2, the prices had shot up by three to four times compared to Period 1 and was conspicuous for the violent fluctuations in prices.

Month-wise price data, obtained from the Bureau of Economics and Statistics, Kerala, Trivandrum, were used for this analysis. The wholesale price of coconuts (with husk) relate to the Alleppey market and that of coconut oil is for Cochin. In the case of farm prices, published data were available on district basis only, and hence the mean figure for the State as a whole was used for this analysis. The multiplicative model ($O = T \times S \times C \times I$, where O represents the original data, T the trend, S the seasonal variation, C the cyclical variation and I the irregular component) was assumed for the estimation of seasonal variation, as this model gives the seasonal movements as a ratio to the trend values. In the present analysis, comparison between two periods is intended for and since these two periods are conspicuous for the sharp price differences, multiplicative model was preferred to the additive model, as the latter method gives the seasonal movements as a deviation from trend, and not as ratio to trend. The trend value corresponding to each month was first obtained by taking the 12-month moving averages and the averages of the successive pairs. The relative deviations from that trend value were taken by taking the ratios of the original series from the corresponding trend values. Thus for both the periods, month-wise figures for six consecutive (contd.. on page 49)

years were available, viz. 1959-64 and 1971-76, for periods 1 and 2 respectively. Finally, the January deviations were averaged, then the February deviations and so on. The trend is eliminated at the first stage and the residual variations, in the averaging process at the third stage. The final result is an average deviation for each month, representing the seasonal variation for the period considered. Seasonal indices thus calculated for the prices of coconut oil and coconuts, for both the periods, are given in Table 4.2 and Fig.5.

The seasonal indices for coconut oil prices were more-or-less showing the same pattern of variation in both the periods. The amplitude of the fluctuations were, however, higher during the latter period and this was due to the violent fluctuations in prices. The coefficient of variations (%) for the estimates were also higher during Period 2. Prices were generally below normal during February-March to September-October. In both the periods, highest price was recorded in November. During Period 1, the lowest price was recorded in April and for Period 2, it was low during March and May, April prices being slightly higher than these two, though below the normal price. The prices showed a rising tendency from August-September onwards. It started declining from November only.

Seasonal indices were more-or-less similar for the wholesale price as well as the farm prices of coconuts. As in the case of coconut oil, amplitude of the fluctuations were higher during Period 2. Similarly the coefficients of variations were also higher during this period. In both the cases (wholesale prices as well as farm prices), during both the periods, the highest price was received during December and the lowest in August. During the monsoon months, the prices were generally lower.

Table 4.2

Seasonal Indices for the Prices of Coconut
oil and Coconuts

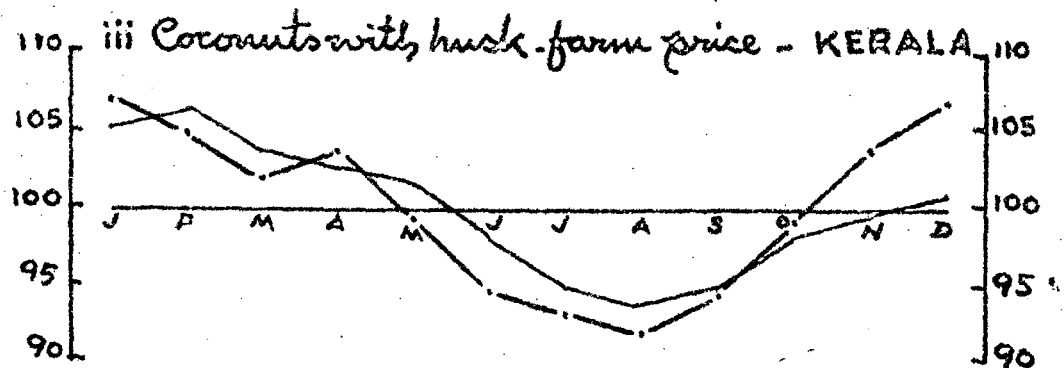
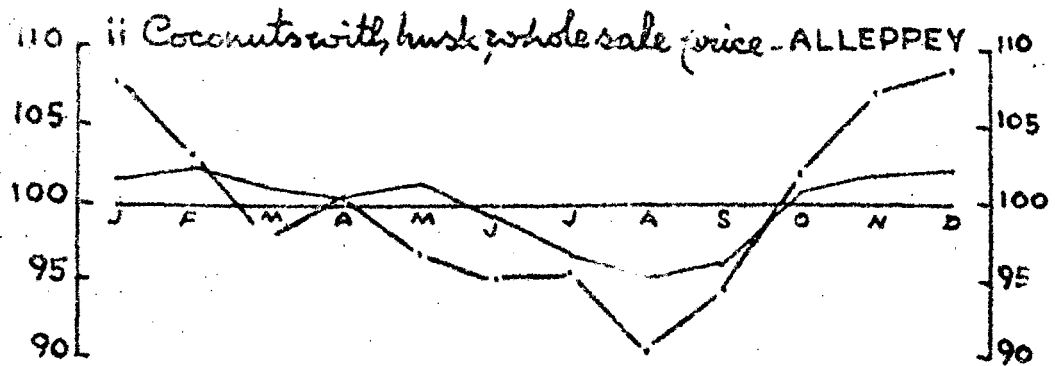
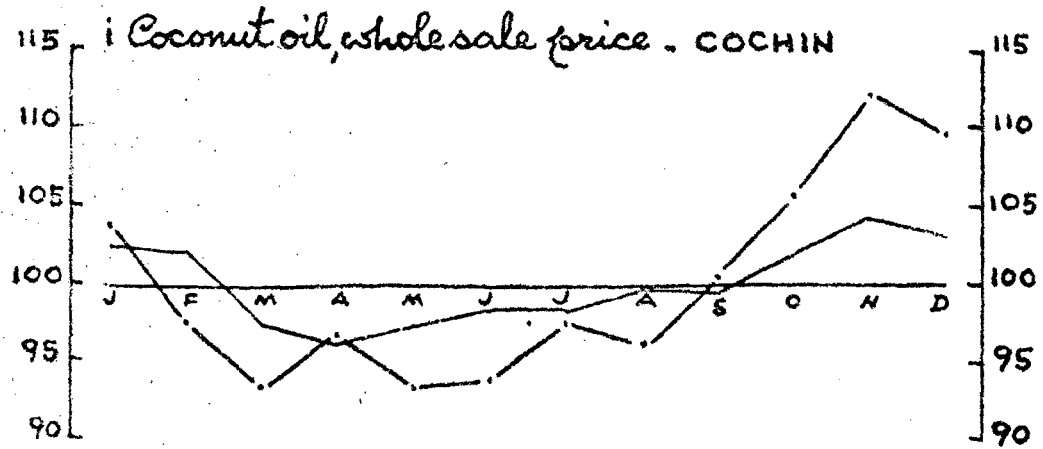
Month	Wholesale price of coconut oil at Cochin		Wholesale price of coconuts at Alleppey		Farm price of coconuts in Kerala	
	Period 1	Period 2	Period 1	Period 2	Period 1	Period 2
January	102.4 (4.4)	103.5 (7.8)	101.8(1.4)	107.9 (9.1)	105.1 (2.5)	106.7 (6.7)
February	101.9 (4.3)	97.3 (5.1)	102.3 (2.9)	103.3 (6.5)	106.5 (1.6)	104.7 (4.5)
March	97.3 (1.8)	93.4 (2.2)	101.1(2.7)	97.9 (3.1)	103.8 (0.7)	102.0 (2.9)
April	96.2 (1.0)	96.4 (2.8)	100.5(2.3)	100.4 (2.4)	102.8 (1.2)	103.5 (2.1)
May	97.2 (2.4)	93.3 (5.4)	101.1(1.7)	96.8 (3.3)	101.6 (1.2)	99.2 (3.1)
June	98.3 (2.6)	94.0 (4.5)	99.4(2.0)	95.2 (4.8)	98.4 (1.1)	94.6 (5.8)
July	98.2 (2.7)	97.5 (7.7)	96.9(1.9)	95.5 (9.3)	94.9 (2.0)	93.0 (8.2)
August	99.7 (1.6)	95.0 (7.9)	95.5(2.9)	90.5 (3.2)	93.8 (2.6)	91.9 (6.3)
September	99.5 (4.2)	100.5 (4.7)	96.3(5.6)	94.5 (7.9)	94.8 (2.8)	94.5 (5.3)
October	102.0 (3.2)	105.8 (5.6)	100.7(3.1)	102.1 (10.8)	98.2 (3.3)	99.0 (6.6)
November	104.1 (4.2)	112.3 (7.7)	102.0(4.6)	107.2 (7.0)	99.7 (4.2)	104.0 (9.1)
December	103.2 (3.9)	109.8 (9.5)	102.4 (4.1)	100.7 (8.8)	100.7 (3.9)	106.9 (7.9)

Note: Numbers in parentheses denote the coefficient of variations (%).

Source of Basic data: Bureau of Economics and Statistics, Trivandrum.

Fig. 5. Seasonal variations in the prices of Coconut oil & Coconuts

— Period 1 - - - - Period 2



4.3 Seasonal Variations in relation to the production cycle of coconuts and coconut oil and pattern of rainfall

It has been explained in Section 4.1 that coconuts, though harvested in almost every year, show seasonality in production, with about 60 per cent of the nuts harvested during the first six months of the year. Similarly in the production of oil also a seasonal trend can be observed. The oil mills are generally having brisk business during the summer months as they start getting the copra (sun-dried) by January-February. Though the arrival of copra will stop by May-June with the onset of monsoon, their stocks will be sufficient to run the mills for few months more.

In Kerala, two monsoons are received - South-west monsoon during June-August and North-East monsoon during September-November. A picture about the distribution of rainfall in the different months can be had from the following table. The period from June to October can be said to be the monsoon months, with the rains starting in the latter half of May.

Table 4.3

Pattern of distribution of rainfall in Kerala,
1970-75

Months	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Percentage of total	0.3	0.4	0.8	4.3	9.4	20.6	22.8	16.6	9.7	9.8	3.8	1.5

Source of basic data: "Statistics for Planning (1977)" - Bureau of Economics and Statistics - Kerala, Trivandrum.

Because of the abundant availability of oil in the market, the prices are generally low during the summer months and during the early periods of the monsoon. During the latter half of the year, the production of coconuts and availability of copra are low and this causes

the market price of coconut oil to rise.

During the monsoon months of June to October, the price of ~~conversion~~ coconut is low. This is due to the lack of facilities for conversion of nuts to copra during this period. The prices rise from October onwards, because of the heavy demand from the oil millers, and the low supply position. Though there is abundant supply of nuts during the first half of the year, the prices have not fallen below normal, because of the heavy demand from the oil millers. Therefore, it is clear, that the seasonality in price of coconuts is more due to demand factors, than due to supply factors.

The relationship of the production cycle of coconuts and pattern in of rainfall with the seasonal variations/ prices can be seen from the following table of correlation coefficients.

Table 4.4

Seasonal variations in prices, in relation to the production cycle and weather factors

	Coefficient of correlation with	
	Production cycle of nuts	Distribution of rainfall
Wholesale price of Coconut oil		
Period 1	-0.7564	-0.3861
Period 2	-0.6873	-0.3652
Wholesale price of Coconuts		
Period 1	-0.2015	-0.2505
Period 2	0.2107	-0.7280
Farm price of Coconuts		
Period 1	0.4872	-0.7921
Period 2	0.1542	-0.9043

4.4 Effect of price rise on producers and traders

Increase in the price of coconut products has been accompanied by fluctuations in prices, not only between years, but within years also. For the eight year period 1970-77, the coefficient of variation (5) for the average annual ~~and~~ wholesale price of coconut oil at Calicut has been 25.02, the range of values being Rs.521 to Rs.1153, for the different years. During this period, there are years when the prices rose by as much as 66 per cent (1972 to 1973) and fell by 27 per cent (1974 to 1975), over the previous year (See Table 2.4). Within the year fluctuations are also of no lesser magnitude. The year 1973 witnessed the doubling of prices of in the course of few months (Rs.976 in January to Rs.1260 in December) for coconut oil at Cochin (See Table 2.2). This uncertainty in price developments always breeds an element of risk for the people connected with the cultivation and trade of the commodity.

In the preceding section it has been stated that the period of price rise has been marked by an increase in the amplitude of seasonal fluctuations also. In the case of wholesale prices, of coconuts and coconut oil, the range for the indices more than doubled during Period 2, compared to Period 1 (from 7.9 to 18.9 points for coconut oil and from 6.9 to 18.2 for coconuts). Such increases is of help only to traders with sound financial backing, who can stock the commodities (coconut and copra) for a better morrow. The average seasonal index for wholesale price of coconuts for the period November to January (lean period in the production cycle, accounting for about 20 per cent of

total production) was only 102.0 during Period 1, compared to 107.9 during Period 2. It is only the big farmers who store the nuts from the first half of the year who can reap benefit from this kind of price change. Similarly the sharp fall of the index for August from 95.5 in Period 1 to 90.5 in Period 2 affects the majority of coconut cultivators, who resort to distress sales. More-or-less similar argument applies in the case of wholesale price of coconut oil also.

During the first half of the year, when 60 per cent of the total production of nuts is harvested, the seasonal index for farm price was 103.0 for Period 1 and it fell to 101.8 for Period 2, showing thereby that the full benefits of price rise are not received at the farm level. It is true that the price index has shown an increase of about 3 points, for the period September to December. But only about 25 per cent of the total produce is harvested during this period and hence is not of much significance to the ordinary cultivators, unless they keep stocks for about six months.

Chapter 5

SUMMARY AND CONCLUSIONS

The present study has shown that the markets for coconuts and coconut products are well integrated. The prices of coconuts and copra are determined by the coconut oil prices. (sections 2.1 and 2.2)

For analysing the price trends, the period 1950-1977 could be divided into three phases - 1950 to 1956, when the prices showed a declining trend, 1956-65, when the prices were slowly rising with moderate fluctuations and the period from 1965 onwards, when the prices not only increased rapidly, but also tended to fluctuate widely. The differential behaviour in price movements could be explained to a large extent by the trends in imports of coconuts, copra and coconut oil to the country. (section 2.3)

At the all-India level, the price movements of coconut oil could not be satisfactorily explained by the levels of production (of either coconut, or of the major oilseeds put together) alone. Other factors representing excess demand, such as imports and income, influence the price behaviour of coconut oil to a considerable extent. Since the prices of other edible oils are also found to move closely with those of coconut oil, the abnormal rise in prices since the mid-'60s has been attributed to excess demand in the edible oil market in general, and not of coconut oil alone. World markets for coconut oil are also seen to be well integrated. Shortages in one or more of the oilseeds in the World market appear to have their effects on the domestic coconut oil market also. (section 2.4)

Since Kerala is a net exporter of coconuts (about 45 per cent of the total production of nuts in the State is considered to be exported to other States, in one form or another), the possible influence of exports of the commodity in the price movements has been indicated. The internal production and the real income of the people in the State are

found to influence the prices at the State level. (section 3.2)

In Kerala, while the intra-State variation in prices of coconut oil tended to diminish with increase in prices in the early 'seventies, an opposite trend was noticed in the case of coconuts. Since the oil markets are well-integrated, inter-district variations in that commodity are negligible. In the case of coconuts, the increasing divergence in prices between districts has come about through relatively small increases in the northern districts where the prices are usually lower and large increases in southern districts, where the prices are usually higher, because of the demand for coconut husk. (section 3.3)

With the increase in prices, though the pattern of seasonal variation remained more-or-less the same, the amplitude of the fluctuations had increased, in the case of prices of coconut oil and coconuts. (Section 4.2)

Seasonal indices for coconut oil prices are found to be influenced by the availability of oil in the markets and those for coconuts (wholesale as well as farm level prices) were found to be influenced by the demand for coconuts from copra makers and oil mills, which in turn depended upon the pattern of rainfall. The influence of supply factors on the price of coconuts is of a limited nature. (section 4.3)

The increase in the amplitude of fluctuations with increase in prices is of help only to traders with sound financial backing, who can afford to stock the commodity. In the case of price of coconuts, the indices have shown an increase during the lean periods of production and a decrease during the peak harvesting season. This adversely affects the majority of cultivators, who are poor and distress sellers. Thus, the increases in prices of the commodity might not have benefitted ordinary cultivators. (section 4.4)