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An Economic Analysis of the Coconut Industry in Thailand

by

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AN ECONOMIC ANALYSIS OF THE COCONUT INDUSTRY IN THAILAND*

Chapter 1

PRODUCTION ANALYSIS

1.1 Production

The major coconut producing countries are concentrated mainly in Asia and Oceania. More than 90 percent of the total area planted is found in these two regions of which Asia accounts for about 80 percent. The Philippines, at present, is the largest coconut producer followed by Indonesia, India, Sri Lanka, Malaysia and Thailand. (see tables 1.1 & 1.2)

In 1970, the coconut production in Thailand was estimated at 1,000 million nuts,[1/] which was far short of the amount demanded. A substantial quality of coconut products, mainly coconut oil and copra was secured from outside sources. The reason is over 90 percent of the domestic production was directly consumed as water nuts or fresh nuts, resulting in a considerable shortage for industrial purposes. The situation was in contrast to the Philippines where 97 percent of the coconut produced was utilized for industrial uses and only 3 percent was directly consumed.

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* Appreciations are hereby expressed to the Ford Foundation for providing a research grant in 1974-75 and to the Food Institute, East-West Center, for its valuable technical advices concerning the research proposal.

1/ ADB "Study of the Coconut Industry in the ADB Region" Volume II Part Two, p. 229.

Table 1.1

APPROXIMATE LAND AREAS PLANTED TO COCONUTS-1971

(Thousand Hectares)

Asia		
Philippines	2,048	
Indonesia	1,800	
India	1,046	
Sri Lanka	446	
Thailand	272	
West Malaysia	213	
East Malaysia	80	
Republic of Vietnam	33	
Rest of Asia (estimated)	162	
Total Asia		6,100
Oceania		
Papua New Guinea	251	
Fiji	72	
Tonga	32	
Western Samoa	22	
Rest of Oceania (estimated)	153	
Total Oceania		530
Africa (estimated)		270
Latin America (estimated)		450
TOTAL WORLD		7,350

Source: ADB, "Coconut Industry," Volume 2.

Table 1.2

WORLD PRODUCTION OF COCONUTS, 1966-1971

(Million Nuts)

	1948-52[a]	1961-65[a]	1966	1967	1968	1969	1970	1971
ASIA								
Philippines	4,453	7,293	7,090	7,925	7,412	7,244	7,745	7,814
Indonesia	4,217	5,924	5,594	5,117	4,950	5,121	5,805	5,900
India	3,656	4,828	4,999	5,192	5,231	5,430	5,440	5,800
Sri Lanka	1,975	2,484	2,460	2,240	2,416	2,601	2,369	2,617
Malaysia	1,006	1,044	1,014	1,050	1,058	1,107	1,064	1,100
Thailand	413	891	936	950	950	1,000	1,000	1,000
Rest of Asia	185	345	389	372	383	352	368	370
Sub-Total	15,905	22,809	22,482	22,846	22,400	22,855	23,791	24,601
OCEANIA								
Fiji	215	235	190	169	164	181	208	208
Tonga	100	67	53	56	56	70	75	75
Papua New Guinea	377	628	679	621	643	740	671	673
Western Samoa	107	109	99	106	60	99	102	102
Rest of Oceania	552	677	650	667	705	647	679	679
Sub-Total	1,351	1,716	1,671	1,619	1,628	1,737	1,735	1,737
AFRICA	1,155	1,347	1,289	1,307	1,397	1,394	1,438	1,440
LATIN AMERICA	1,055	2,068	2,103	2,257	2,327	2,241	2,197	2,190
WORLD TOTAL	19,466	27,940	27,545	28,029	27,752	28,227	29,161	29,968

[a] Annual averages.

Source: FAO Production Yearbook, 1970 P.24. However, much revised data based on findings of the Study are included. Approximated and confirmed data are not distinguished.

Recently, the expansion of the coconut production in terms of area planted has been quite noticeable. In the past, coconut was the product of the South where commercialized plantations in a great number were found. However, the rapid growth rate of the production and hence a greater market share during these recent years have been recorded elsewhere in the North and Northeast. Nevertheless, the South still remains as the most important producer, accounting for about 40 percent of the total planted area. There are two main reasons for the recent expansion. Firstly, its price has been continously rising both in absolute term and in comparison with other agricultural products. This trend will obviously accentuate at an even more rapid rate in the future when the demand from various expanding industries is forthcoming. Secondly, the coconut is climatically suitable to Thailand. It grows anywhere and needs very little care.

In terms of the actual number of coconut production, the statistics available are quite confusing and may be even unreliable. According to the Office of the Undersecretary of State, Ministry of Agriculture,[1/] the average growth rate during 1957-1973 is put at only 0.45 percent per annum. Surprisingly, despite the increase in area planted, the production actually decreased from 936 million nuts in 1965 to only 576 million nuts in 1966. It increased again to 595 and 642 million nuts in 1970 and 1971 respectively, but then decreased again during 1972-1973 to only 561 and 533 million nuts.

1/ See Table 3 and 4.

Table 1.3

COCONUT AREA PLANTED AND YIELDS

Year	Area Planted (1,000 Rais)	Bearing Trees (1,000 Trees)	Yields (1,000 Nuts)	Average Yields Per Tree
1957	850	17,631	1,047,773	59.43
1958	845	17,224	920,112	53.42
1959	836	14,152	723,731	51.14
1960	1,029	16,717	832,186	49.78
1961	1,157	17,923	834,264	47.05
1962	1,322	19,622	878,557	44.77
1963	1,400	20,459	919,600	44.85
1964	1,400	20,500	877,600	42.81
1965	1,550	20,800	936,000	45.00
1966	1,545	20,850	854,850	41.00
1967	1,700	22,248	859,305	38.62
1968	1,786	22,440	580,074	25.85
1969	1,855	25,025	576,845	23.05
1970	1,978	25,970	595,526	22.93
1971	2,056	26,555	642,631	24.20
1972	2,166	26,980	561,913	20.82
1973	-	28,100	633,000	19.00

Source: Agricultural Economics Division, Office of the Undersecretary of State, Ministry of Agriculture.

Table 1.4

COCONUT AREA PLANTED AND YIELDS BY REGION-THAILAND

(area = 1,000 rais
yield = 1,000 nuts)

Year	North		Northeast		Central		South	
	Area	Yield	Area	Yield	Area	Yield	Area	Yield
1958	7	7,251	88	48,356	290	262,835	459	601,670
1959	8	7,335	76	35,764	296	147,366	456	533,266
1960	10	7,814	121	66,817	386	204,219	512	533,336
1961	20	13,110	127	71,498	458	219,948	552	538,708
1962	29	19,287	171	95,486	557	249,186	556	514,598
1963	31	23,470	182	102,704	586	264,379	601	527,047
1964	31	24,000	182	104,000	586	264,000	601	485,600
1965	85	28,000	185	105,600	600	280,000	680	522,400
1966	80	26,240	188	96,000	610	282,000	667	450,610
1967	77	31,115	218	115,197	706	275,107	699	437,886

Source: Department of Agriculture

Figure 1.1
Coconut Area Planted : Production
1957 - 1973

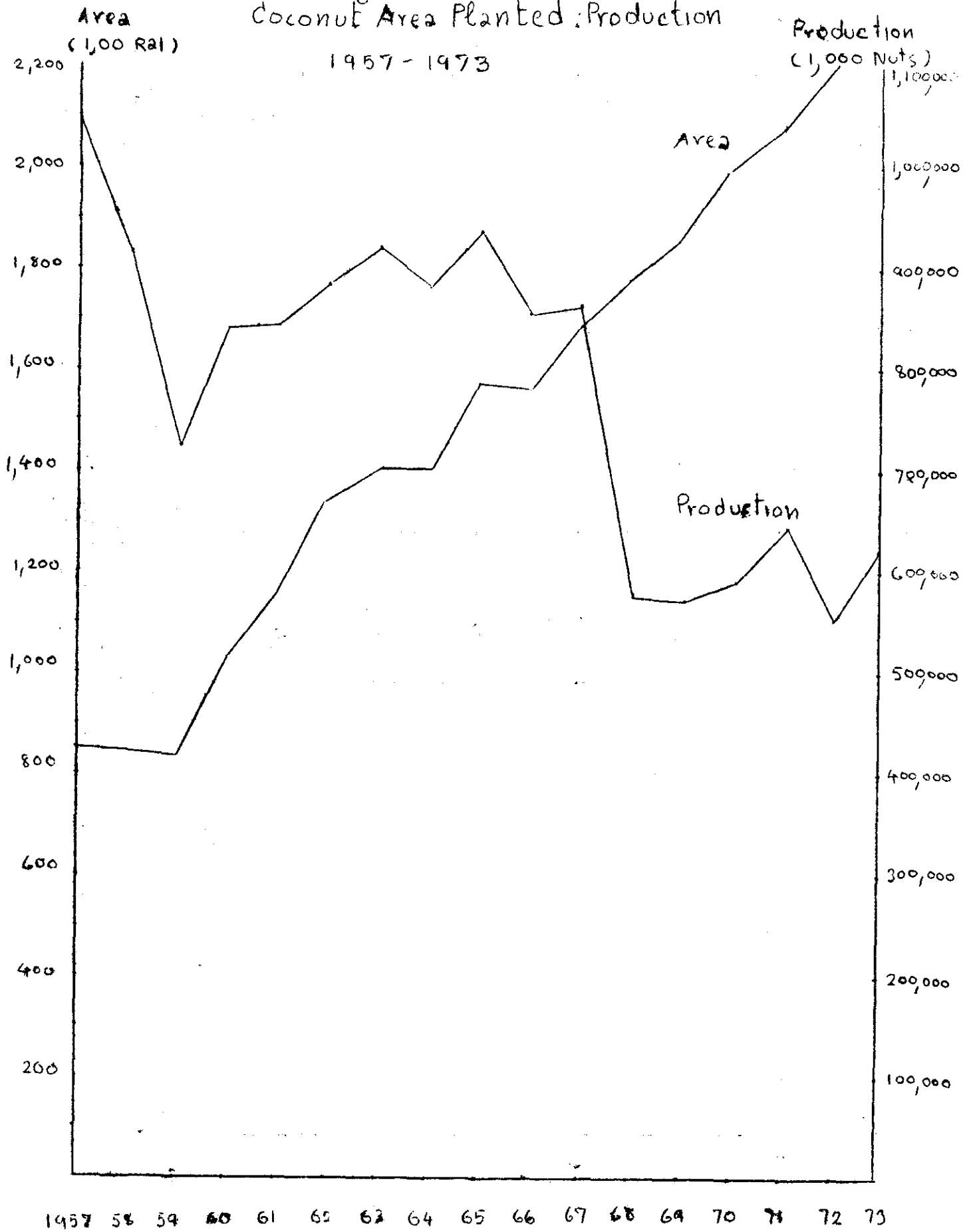


FIGURE 1.2
Coconut Area Planted Production, by Region

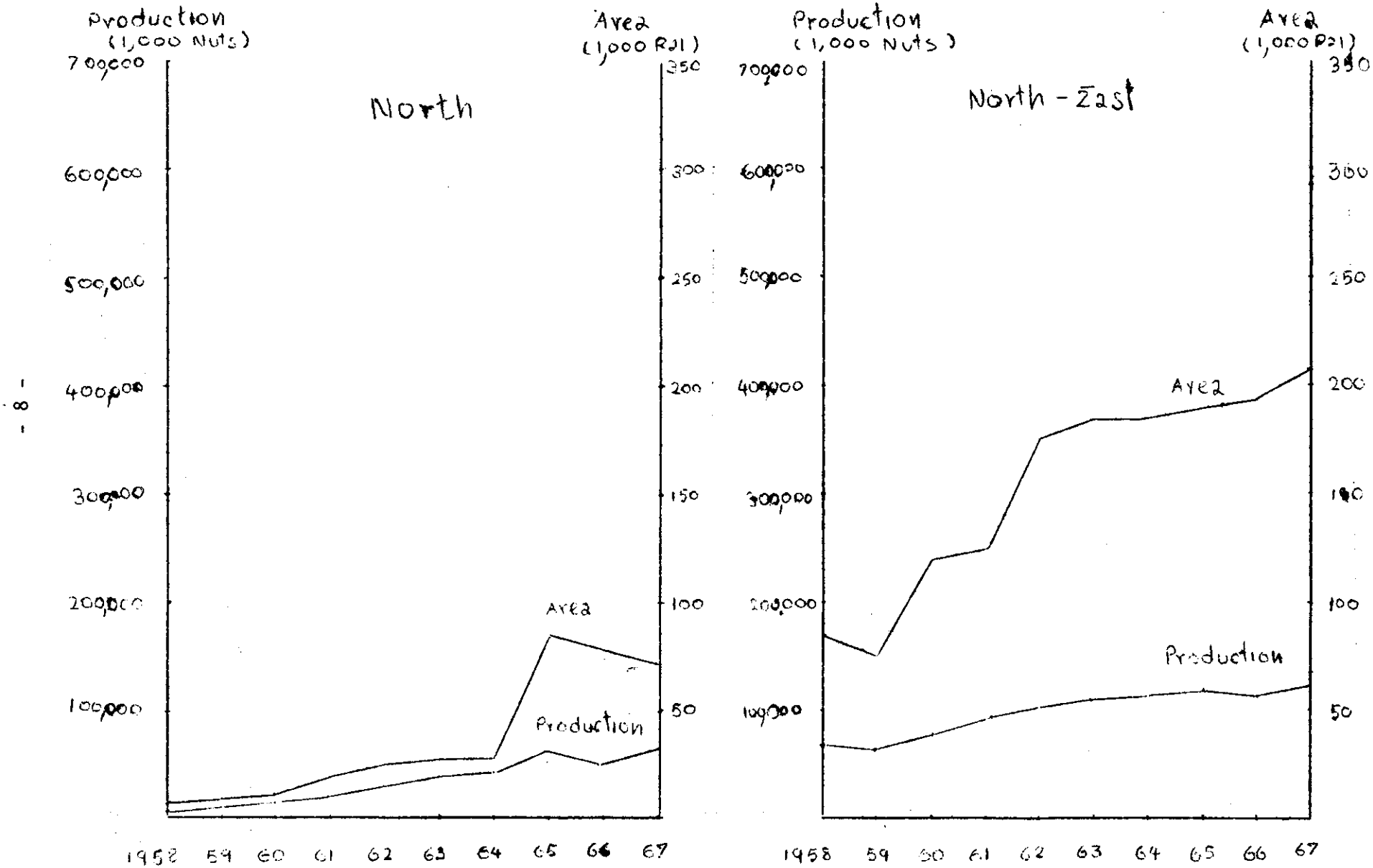
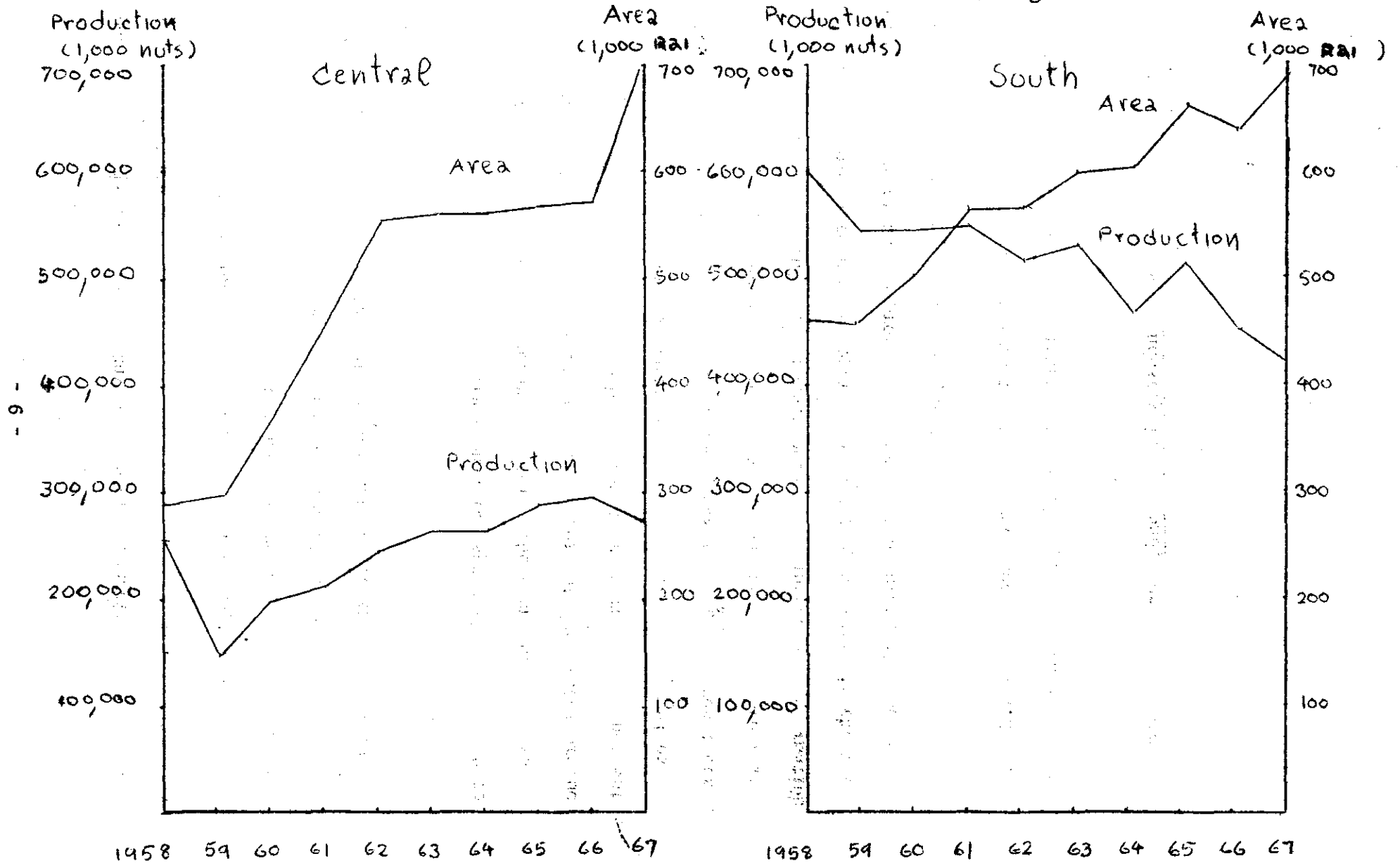


Figure 1.3
Coconut Area Planted Production, by Region



Basing upon this information, the pattern of production can be characterized as follows:

(1) The period of expansion during the years 1950 to 1965. During this period both area planted and its production were rapidly increasing, i.e., at the average annual rates of 7.4 percent and 3.3 percent respectively. Note that the production growth rate always lags behing the planting rate.

(2) The period of contraction which spans the years 1966 to 1973, an unusual phenomenon occurred. While the planting area was increasing at the average annual rate of 5.3 percent, the total production rate was disturbingly declining at the average rate of 11 percent a year. If this statistic is correct, there is only one logical explanation. That is the existence of the excessively old barren trees, which naturally depresses the overall production rate. To prove this point is a very difficult task mainly because of inadequate information. However, according to Rhee's report[1/] on a survey of farms in the two biggest coconut producing provinces, Chumpon and Surathani, such a hypothesis cannot be possibly accepted.

From Table 1.5, barren trees were recorded at only 4.2 and 9.8 percent in Chumpon and Surathani respectively. Less than 12 years

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1/ Rhee, Jao Han, Coconut Industry in Thailand, (Draft 1972) UNDP/FAO. Technical Report.

old trees accounted for the 48.7 percent (25.4 percent for those less than 5 years plus 23.3 percent of those between 6 to 12 years) and 27.9 percent in Chumpon and Surat Thani respectively. Groups of trees were lumped together under an unusually too long interval period of 13 to 50 years of age. These groups accounted for 45.0 percent of the total in Chumpon and 66.5 percent in Surat Thani. Admittedly, these old trees (over 25 years) do not yield satisfactorily but in no way can they fluctuate the overall production drastically from year to year as indicated by the statistics published by the Bureau. Moreover, the coconut trees in these two provinces happen to be among the oldest in the Kingdom and since Rhee's finding is not applicable to the situation in other regions, we cannot accept the explanation of the "old age" theory. Instead, we cast a great doubt on the validity of the official data.

Regarding farm size, there exist some problems in securing accurate data. It has been a consensus of opinion that there is only a handful of big farms in the form of commercialized plantation in Thailand. Most of the coconut farms are small in size, consequently, coconut does not constitute the principal income of the farmers. Rather, it is regarded as a supplementary source of income. Hence, we generally find a mix-farming in the area where coconut is extensively grown. According to Rhee's report,[1/] in the densest coconut-growing area, only

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1/ Rhee, J. Han (1972), op.cit., p. 5.

73 percent of the land is for coconut farming averaging about 28.8 rai per family. The rest of the land is for other cash crops mainly rice and vegetables.

The 1963 Census on Agriculture[1/] also reveals the same finding. Less than one percent of the holdings are greater than 24 hectares where 80 percent of the holdings are under 7.2 hectares as shown in Table 1.6

Table 1.5

DISTRIBUTION OF COCONUT TREES BY AGE AND BEARING STATUS IN CHUMPON AND SURATHANI

Percent

Age of Tree	By Province		By Farm Size: Rai			All Farms
	Chumpon	Surathani	15	15-45	45	
Less than 5 years	25.4	9.8	20.7	13.9	17.3	16.5
6 to 12 years	23.3	18.1	22.1	21.6	18.4	20.4
13 to 50 years	45.0	5.6	6.7	6.3	5.1	5.7
Over 50 years	6.3	5.6	6.7	6.3	5.1	5.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
Barren Trees*	4.2	9.8	5.8	8.3	7.1	7.4

1/ National Statistical Office, Census of Agriculture 1973.

* Included in Total

Source: Rhee, Jao Han (1972) op.cit.

Table 1.6

COCONUT CULTIVATION

1963

Size of Holding	Percent of Total
Under 2.4 Hectares	40.8
2.4-7.2 Hectares	41.0
Over 7.2 Hectares	18.2
Total	100.0

N.B. Less than 1 percent of holding are greater than 24 hectares.

Source: Census of Agriculture, 1963, National Statistics Office

There are two ways to expand the coconut farm, by acquiring the existing farm through buying and by clearing the forest. Since the cost of clearing the virgin land is considerably less than the former method (about 500 baht per rai for clearing), it became a popular means of farming and a large area of forest has been cleared both for this purpose and for other agricultural products. However, due to the rapidly vanishing rate of the virgin land, acquiring more cultivated area by this method is becoming more difficult. One reason for high demand for newly opened land is the high productivity of the land itself. More fertilizer and other cares are needed to have a

high yield. But since the opportunity of getting more of such land is decreasing, more farmers have turned to the replanting of the old trees in an effort to obtain high yield. There exists a clear evidence that old rubber plantations have been turned to coconut farms at an increasing rate.

The growth rate of coconut production by region has been given in Table 1.7

Table 1.7

ANNUAL GROWTH RATE IN COCONUT FARMING 1967-68

(Growth rate in Percent)

Region	Area	Production
Northern	29	13
Northeastern	7	5
Central	5	3
Southern	4	3

Source: Department of Agriculture

According to this official data, the overall growth rate had been spectacular in the northern region where the expansion in planting area and the increase in production were registered as 29 and 13 percent per year respectively. In contrast to the situation

in the North, the South which is the main producing region finds itself lagging behind all other regions in terms of growth rates, as evidenced by 4 percent growth rate in area planted and 3 percent in the actual yield. This statistic in no way indicate the relative role of the South as the biggest coconut producer.

In terms of yield per tree, Table 1.8 summarizes the general story.

Table 1.8

ANNUAL AVERAGE YIELD PER TREE: BY REGION

(1969-70)

Northern	18 nuts
Northeastern	31
Central	27
Southern	20

Source: Department of Agriculture

The highest average yield per tree was found in the Northeastern region where 31 nuts was recorded and the lowest yield was in the Northern region. The biggest producer, the Southern region recorded a mediocare productivity, where the Central Plain was a little above average with 27 nuts per tree.

If these yields do not fluctuate from year to year but instead hold their own trend smoothly, it is very difficult to rely on the official statistic on the swinging overall production mode as already discussed in Section 1.4.

However, these yields are still considered too low compared with those in other countries. The reason for this sub-standard productivity is a result of many factors. Major ones are:

1. Too many old trees with very low yield.
2. The present trees are of low quality, there is no system in selection of seeds.
3. Lack of scientific method of farming and care.
4. Insufficient application of fertilizer.

1.2 Processing

1.2.1 Copra and Coconut Oil

As it has already been mentioned, over 90 percent of the total coconut production in Thailand is used for immediate consumption such as for water nuts or as food preparation. The rest which goes to industrial uses is of a relatively low quality since it commands less income to the growers. Especially copra, most of it is made from undersized or broken nuts left after the primary fresh nut marketing. Therefore, it is quite safe to say that the amount available for industrial purposes is in fact "residual" of the total

coconut production in Thailand.

The key answer to this pattern of distribution is the structure of coconut prices for various kinds. Fresh nuts always command a higher price than any other forms of coconut products. This results in a poor quality of output in general. Only copra for some specific areas, such as Narathiwat where a good standard of copra equivalent to that from Sri Lanka is produced, can earn its producers a better price, i.e., above average.

However, in general its quality is still sub-standard. Over 80 percent of copra is produced by an old fashioned smoke-drying process and the rest is mainly by sun-drying method. A more sophisticated hotair dryers are not common in Thailand and this accounts for a negligible amount of copra. Consequently, the average quality is poor. It contains a relatively high percentage of moisture, an average of 10-12 percent or sometimes as high as 35 percent in rainy season. Moreover, a substantial amount of copra is lost or unmarketable because of contamination. High-moisture content copra tends to be rotten easily by some micro-organisms brought about by various kinds of insects.

As shown in Table 1.8, over the past 8 years, copra production has been around 21,000 tons annually on average. The year 1969 was an exception. Its low quantity was the direct result of the drought in 1967/68 season which did a great deal of damage to the overall coconut farming.

Table 1.9

THAILAND COPRA: DOMESTIC PRODUCTION
IMPORT & EXPORT 1960-1970

Year	Domestic Production (Tons)	Imports (Tons)	Exports (Tons)	Value (Baht)	Net Domestic Supply (Tons)
1960	28,000	-	3,439	n.a.	24,570
1961	19,000	-	178	n.a.	18,822
1962	20,000	-	15	n.a.	19,985
1963	21,000	-	58	n.a.	20,943
1964	21,000	380	16	n.a.	21,364
1965	21,000	569	342	843,900	21,227
1966	20,000	-	1,439	3,507,220	18,561
1967	15,000	508	-	-	15,508
1968	20,800	-	16	35,330	20,798
1969	8,500[b]	2,247	-	-	10,247
1970	21,002[a]	-	-	-	21,000[a]
1971	-	210	-	-	-
1972	28,830[c]	4.5	-	-	-
1973	-	18.0	1,805	2,124,973	-
1974	-	2.4	-	-	-

[a]Estimated by ADB

[b]Drought in 1967-1968 seriously affected production in 1969.

[c]From survey 1972-1973 in 13 provinces.

Source: Department of Customs, Bangkok.

Table 1.10

THAILAND'S CRUDE COCONUT OIL: DOMESTIC PRODUCTION IMPORTS AND EXPORTS, 1960-1970

Year	Domestic Production (Tons)	Imports (Tons)	Exports (Tons)	Value of Export (Baht)	Net Domestic Supply (Tons)
1960	13,513	264	7	n.a.	13,770
1961	10,035	51	2	n.a.	10,084
1962	10,992	471	-	-	11,463
1963	11,519	169	1	n.a.	11,687
1964	11,750	1,470	-	-	13,220
1965	11,675	676[b]	120	n.a.	12,231
1966	10,208	-	18	81,260	10,190
1967	8,528	603[c]	65	294,577	11,375
1968	11,440	-	-	-	5,636
1969	5,636	-	-	-	20,000[a]
1970	20,000[a]	-	-	-	-
1971	-	-	-	-	-
1972	15,902[d]	-	-	-	-

[a]Estimated by ADB

[b]Value at 4,675,815 baht

[c]Value at 3,067,511 baht

[d]From survey 1972-1973 in 13 provinces

Source: Department of Customs - Bangkok

However, the copra production in any one year is estimated to be far below the actual demand which seems to be increasing at a rapid rate in the recent year. An estimate[1/] put it that the actual demand for copra in Thailand runs about 36,000 tons annually. This estimate was rather conservative as compared to our own figure presented later in this study. But even with this conservative estimate there is still a deficient supply of copra at about 75 percent of the existing supply. Consequently, this deficient amount has to be imported. The rate of smuggling is said to be rather high in the past.

The shortage of coconut for industrial purposes does not only act as the barrier to the industrial growth but also does a lot of damage to the coconut processing industry. For example, there were altogether 97 oil mills in Thailand, 5 of which were in Bangkok area in 1970, but the business was so bad that only 26 of them are still in business in 1975 and only 2 in Bangkok. The rest have to close down mainly because of the shortage of raw materials and the continuously rising production cost. The ones still remaining operate for less than their usual capacity.

Table 1.10 shows the amount of crude oil produces domestically in Thailand. In 1970, 20,000 tons of crude coconut oil was produced. About the quarter of it was oil used mainly in margarine production which utilized about 500 tons annually. About 1,800 tons were

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1/ ADB - Study of the Coconut Industry in ADE Region, Vol. II, p. 235.

refined coconut oil for cooking and since the domestic supply was insufficient, a major portion had to be imported from the neighbouring countries.

1.2.2 Coir Fiber

In the past, coconut husk in Thailand was used only for fuel especially for copra-making process. Just only since the last decade or so that it has become an important raw material for industrial production. The transformation was first tried into the bale fiber but later was switched to cured rope because of the drop in the demand for bale fiber. It was in early 1962 that the first coir factory was estiblished at Pandon in Surathani. The second one was built a year later on the island of Kosamui by the Thai Coconut Industry, Ltd. The products from these two factories were for export only. They turned out on the average of about 3,300 tons each year. At the present, these two factories are facing a lot of difficulties. The raw material is hard to obtain and most of their machines are very much obsolete.

Newer factories established recently are better equipped with domestically-designed machines at a much lower cost and higher efficiency rate. But the problem of over-production still remains. The lack of a sizeable market forces some of them to close down for several months, notably those in Chumpon. The remainders are still in operation simply because they can secure a long-term contract with the Thai Coconut Industry, Ltd. Also, it is generally accepted that the coconut husk from

other places especially from Prachuab-Kerikan has better quality than that in Chumpon.

Exports to Japan and Europe are of small quantity and not significant enough to accommodate the available output as evident in the Table 1.9.The main reason for such a low level of export is that these products are internationally sub-standard and dishonesty in the Thai export trade practices.

Domestic consumption of coir fiber is also small. There exists only three small factories producing mattresses and bristle fibers and turning out only small quantity of products.

1.2.3 Other Coconut Products

Over 90 percent of the coconut related products are consumed domestically such as coconut fresh, milk and grated coconut. Nearly all of them are for home consumption. For example, coconut sugar-evaporated fresh unfermented coconut sap-is popularly used as an ingredient in Thai food and sweet. It is estimated that around 10,000 tons are used for these purposes.

1.3 Coconut Varieties

Coconut found in Thailand can be generally classified into three main categories.

1) Dwarf or Light Coconuts - The tree is short and its nuts' weight is Light. They bear fruits precociously around three or four years. Popularly consumed as water nuts when they are young. The fruit is a little smaller than the average coconut but its water has a unique and pleasent smell. This is a special variety not suitable for food preparation. Therefore, they are marketed only while they are young.

The physical appearance is easily noticeable. It tends to have narrow stems and short leaves. When it bears the first nut, the tree is only 1 to 1.5 meters tall, and capable of yielding fruits up to 40 years continuously. After that the yield is declining sharply. The color of the fruits can be sub-categorized as follows.[1/]

1.1 "Nok-Koom" or just "Koom" which has green color and very small.

1.2 "Mu-See-Keo" also of a green color but the fruit is of medium size.

1.3 "Nam-Hon-Bia" a very distinctive coconut with aromatic young leaves and aromatic coconut water.

1.4 "Nar-Ri-Key" a round nut with a yellowish-orange color.

1.5 "Ma-Prao-Phai" a dwarf variety with half yellow-half red color. This type is similar to the wellknown Malaysian yellow drawf.

1/ See Hunting Team (1974) Coconut, p. 18.

This kind of coconuts are grown mostly around Bangkok and other big cities near the market. The quantity grown is unknown and difficult to estimate but they are seemingly on the expanding trend since the market for this type of coconut is still far from saturating point and the price is still good.

2) Tall or Heavy Coconut

This type is characterized by the large size of nut and the weight is rather heavy. The tree is very tall and its leaves are long. It bears fruits within 7 or 8 year after planting and lasts for more than 80 years. Various names are given to this type such as Ma-Prao-Yai, Park-Choke, Ka-Loke, Ma-Prao-Ploak-Hwan, etc. These names are not scientifically distinctive in characteristic, as they are actually the same type but with different names.

This variety is normally consumed when they are fully ripe. The meat is thick and hard suitable for food preparation. All kind of processed coconut products are made from this type. Its water is more sour than sweet hence it is not popularly marketed as drinking nuts.

Coconut farms and products in Thailand are largely of this type. Its market share are estimated to be over 90 percent of the total. The major area grown is found in the South along both east and west coasts.

3) Intermediate Coconut or Ma-Prao-Klang.

This type of coconut is very similar to the second type but the difference is visible. The fruit is of medium size, a little smaller than the heavy nut but larger than the light nut. It starts to bear fruits after 5 years of planting. Marketed as a ripe nut for food processing. A couple of names are well-known, they are Ma-Prao-Mu-Su-Klai and Ma-Prao-Ta-Lai-Leo.

1.4 Production Practices

Many possibilities are available to traditional farmers in an attempt to increase the production.

a. through the selection of high yield varieties
b. through the use of fertilizer
c. through an intensive control of diseases
d. through the possibility of intercropping

1.4.1 Selection of Seeds

Most of the farmers raise their own seedings using selected nuts from their own plantation or sometimes from their neighbouring farm. The method of selection is simple. They choose seedings from the highest possible yielding trees. New farmers are reportedly more cautious about their seedings and such only high yield varieties are used. However, there exists numerous factors determining the coconut productivity such as location, climate or soil condition which affect

the yield considerably. Therefore, there is no guarantee that good seeds from one farm will definitely produce satisfactory outcome in another farm in the different locality.

Producing a new higher yield variety is quite technical and time consuming. Without government assistance, the task is nearly impossible. At the present, there are four nursery stations, all belong to the government, for the development of high yield coconuts. These are located in Phun Phin, Klong Than, Songkhla and Sawii Agriculture Experiment Station. The last one has been established for a little more than a decade but the rest are very still new and their management need to be further improved.[1/] As a whole, the farmer cannot make use of this facility for quite sometime. The establishment of these nurseries is a part of the rural accelerated development plan of the government. Apparently, what has been done so far is still far from adequate to improve the coconut industry as a whole, more effort and money is needed if a definite result is to be expected in the near future. As to date, less than 100,000 nuts annually can be supplied to the farmers from these stations.

1.4.2 Use of Fertilizer

There is a rare use of fertilizer in the coconut farming. Virtually no chemical fertilizer is used at all in small farms. There is no general consensus on the benefit of fertilizer to the

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1/ See Hunting Team "Coconut" 1974, pp. 27-28.

coconut farms. Some believe that it can increase the productivity if properly applied but because of the lack of working funds of the farmers, it has not been used extensively enough. But there are some who do not believe at all that fertilizer is of any good to coconut. The confusion on this matter needs to be singled out straight and the outcome of the analysis has to be publicized effectively. In the later part of this section, an economic analysis of the use of fertilizer will be made. But before going to that let us review some of the findings undertaken by the government recently.

Basing on the report made by the Agricultural Economics Section, Office of the Undersecretary of State, Ministry of Agriculture, Thailand in 1971 used 289,950.06 tons of fertilizer but only 1,494.50 tons are used for coconut. Classification by region reveals that the South which is the main growing area used only 805.54 tons and the rest is used in the Central Plain. Out of the total growing area of 2,056,000 rais, only 70,214 rais are under fertilization. The detail information is as shown in the Table below.[1/]

Table 1.11

AREA UNDER FERTILIZATION

	Total Area Cultivated (Rai)	Area Under Fertilization
Southern Region	1,274,897	44,849
Central Region	575,500	15,313
Northern Region	18,319	N
North Eastern Region	187,284	N

N = Negligible amount of fertilizer is used.

1/ Agricultural Economics Division

On average, on 21.29 kg. of fertilizer is used for one rai of coconut which is considerably far less than the minimum amount required. Hence, it is tantamount to only 0.51 percent of the total fertilizer used for agriculture of the entire Kingdom.

According to the survey, only 1,493.50 tons of fertilizer was applied to the coconut plantation in 1971 and nearly all of it was of the formula 12:12:17.2. It was a different type of fertilizer as recommended by Swaii Station which was 8:8:18:2.7. However, it is believed that the recommended formulas may not be effectively applicable to all type of soil. But again, to test the actual effectiveness of different formulas for different types of soil would take a long time and certainly non-conformable to our objective of a short run improvement of the coconut productivity. The most practical way out is to use the rule of thumb by recommending the type of fertilizer according to the laboratory chemical analysis of the coconut leaves from various parts of the country to determine the nutrients deficiencies and then find the proper formulas for them. Anyhow, regardless of the methodology, what is more important is whether the use of the chemical fertilizer does really improve the farmers' net earnings.

To answer this question, let us analyse the results obtained from the Sawaii experiment for they may shed some light on the problems of income and productivity of the coconut industry in Thailand.

1.4.3 Economic Analysis of the Sawii Experiment

Our economic analysis is based on the actual technical data obtained from Sawaii Agriculture Experiment on the effect of

fertilizer in 1974.

The experiment was conducted at 4 different locations, two of which were in Chumpon and another two plots were in Tub-Sa-Kae. The experiment was aimed to measure the effect of fertilizer on the coconut yield, therefore, three types of treatment were established for the purpose of comparison.

a. Ploughing + planting bean crop cover soil + digging hole for husk + chemical fertilizers (Treatment I)

b. Ploughing + planting bean crop cover soil + digging hole for husk (no fertilizer) (Treatment II)

c. Ploughing only at the first time of treatment and control weeding all year long (Treatment III)

The summary of the cost and benefit of these three treatment are summarized in the following tables.

To measure the effect of fertilizer we transform everything into money terms using ฿2.50 for the price of a coconut.[1/] According to Table 1.12, after three years of treatment, the outcome was somewhat surprising. The best method in terms of profit was found in the simplest treatment that is Treatment III where no fertilizer and other cares were needed. Method II with a little more make-up but still no fertilizer produced a better result than the first complicated technique. The profit ratio were ฿773.6, 561.2 and 297.2 per rai respectively for Treatment I, II and III during the three years of experiment. What has

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1/ See The Table 1.18 following Chemical Fertilizer's Price.

Table 1.12

COMPARATIVE COCONUT YIELD IN THE PLOT WHERE TREATMENT ARE DIFFERENT AT TAB-SA-KAE

Farmer: Mr. Prayoon Petdee

Palm Tree Ages: 22 Years

	SEPT. 72 - AUG. 73			SEPT. 73 - AUG. 74			SEPT. 74 - AUG. 75 1/		
	Treatment I	Treatment II	Treatment III	Treatment I	Treatment II	Treatment III	Treatment I	Treatment II	Treatment III
Yield per year	22.19*	29.11	28.30	31.64**	37.24	37.06	39.37***	46.82	38.57
Increment:									
Annual Yield/Year				9.45	8.13	8.76	17.18	17.71	10.27
Value/Rai 2/				37.8	325.2	350.4	687.2	708.4	410.8
(1 Rai has 16 trees)									
Invested Cost	500	300	200	214	-	-	214	-	-
NET PROFIT	-500	-300	-200	-336	25.2	150.4	297.2	773.6	561.2

1/ Counting nut on tree

2/ Average coconut price annually 2.50 ฿/nut

I Treatment I: Chemical fertilizer, crop cover soil, husk ploughing.

II Treatment II: Crop cover, husk, ploughing

III Treatment III: Ploughing, control weeding

* Fertilizer formula 12:6:18 and 3 kg./tree/year

** 2 kg. of ammonium sulphas, 1 kg. of magnesium sulphas total 3 kg./tree/year

*** 2 kg. of ammonium sulphas, 1 kg. of magnesium sulphas total 3 kg./tree/year

Source: Annual Report 1974 of Sawii Experiment Station, Department of Agriculture.

Table 1.13

COMPARATIVE COCONUT YIELD IN THE PLOT WHERE TREATMENT ARE DIFFERENT AT CHUMPON

Farmer: Mr. Cheaw Poak-no-po
Palm Ages: 10-15 years

	Jan. - Dec. 1973			Jan. - Dec. 1974			Jan. - Dec. 1975 1/		
	Treatment I	Treatment II	Treatment III	Treatment I	Treatment II	Treatment III	Treatment I	Treatment II	Treatment III
Yield per Year	12.60*	9.85	4.37	21.88**	12.80	5.58	20.40***	13.55	12.68
Increment:									
Annual Yield/Year				9.28	2.95	1.21	780	3.70	8.31
Value/Rai 2/				371.20	118	48.4	312	14.8	332.4
Invested Cost	500	300	200	214	-	-	214	-	-
NET PROFIT	-500	-300	-200	-342.8	-18.20	-151.6	-246.8	-32.4	180.8

1/ Counting nut on tree

2/ Average Coconut Price Annually 2.50 baht/nut

I Treatment I: Chemical fertilizer, crop cover soil, husk, ploughing.

II Treatment II: Crop cover soil, husk, ploughing

III Treatment III: Ploughing, control weeding

* Fertilizer formulas 8:8:18:2.7 and 2.5 kg./tree/rai

** Fertilizer formulas 8:8:18:2.7 and 2.85 kg./tree/rai

*** Ammonium sulphas 1.2 kg. double super phostate 0.5 kg. potassium chloride 1.15 kg. totally 3.35 kg./tree/rai/year.

Source: Annual Report 1974 of Sawii Experimental Station, Department of Agriculture

Table 1.14

COMPARATIVE COCONUT YIELD IN THE PLOT WHERE TREATMENT ARE DIFFERENT AT CHUMPON

Farmer: Mr. Jamroon Suwanapak

Palm Age: 15 years

	Nov. 72 - Oct. 73			Nov. 73 - Oct. 74			Nov. 74 - Oct. 74 1/		
	Treatment I	Treatment II	Treatment III	Treatment I	Treatment II	Treatment III	Treatment I	Treatment II	Treatment III
Yield per Year	11.91*	42	12.19	17.58**	7.10	14.03	52.9***	26.8	30.51
Increment									
Annual Yield/Year				5.61	-2.32	1.24	45.93	17.38	18.32
Value/rai 2/				224.4	-92.8	73.60	1,837.2	695.2	73.28
Invested Cost	500	300	200	214	-	-	214	-	-
NET PROFIT	-500	-300	-200	-499.6	-392.8	-126.4	1,153.6	392.8	606.4

1/ Counting nut on tree

2/ Average coconut price annually 2.50 baht/nut

I Treatment I: Chemical Fertilizer, Crop cover soil, husk, ploughing

II Treatment II: Crop cover soil, husk, weeding

* 8:8:18:2.7 totally 3.1 kg./tree/year

** 8:8:18:2.7 totally 3.1 kg./tree/year

*** Ammonium sulphas 1.5 kg. double super phosphate 0.5 kg., potassium chloride 1.1 kg. magnesium phosphate 0.5 kg. totally 3.6 kg./tree/year

Source: Annual Report 1976 of Sawii Experiment Station, Department of Agriculture.

Table 1.15

COMPARATIVE COCONUT YIELD IN THE PLOT WHERE TREATMENT ARE DIFFERENT AT TAB-SA-KAE

Farmer: Mrs. Wanida Jarusee

Palm Age: 22 years

	Oct. 72 - Sept. 73			Oct. 73 - Sept. 74			Oct. 74 - Sept. 75 1/		
	Treatment I	Treatment II	Treatment III	Treatment I	Treatment II	Treatment III	Treatment I	Treatment II	Treatment III
Yield per Year	19.78*	25.53	-	28.83**	16.56	-	38.77***	26.33	-
Increment									
Annual Yield/Year	-	-	-	7.05	-8.97	-	18.99	0.80	-
Value/Rai 2/	-	-	-	2.82	-358.8	-	759.6	32	-
Invested Cost	500	300	-	214	-	-	214	-	-
NET PROFIT	-500	-300	-	-432	-658.8	-	133.6	-628.8	-

1/ Counting nut on tree

2/ Average coconut price annually 2.50 baht/nut

I Treatment I: Chemical fertilizer, crop cover soil, husk, ploughing

II Treatment II: Crop cover soil, husk, ploughing

III Treatment III: Ploughing, control weeding

* 12:6:18, 3 kg./tree/year

** Ammonium sulphas 2 kg. magnesium oxide 1 kg./tree/year

*** Ammonium sulphas 2 kg. magnesium oxide 1 kg./tree/year

Source: Annual Report 1974 of Sawii Experiment Station, Department of Agriculture.

revealed here forced us to seriously question the logic of the general belief that higher productivity hence more profits can be had by the increase in the use of fertilizer. The fact is just the contrary. Using more fertilizer may very well increase the yield per rai but with the existing price of fertilizer and coconut, the farmers cannot reap the benefit from the increase yield in this way at all. Since after the final verdict has thrown in terms of net profit, the farmers stand to lose more than to gain if he consistently applies fertilizer as a means to achieve higher yield.

Worse is yet to come, when we consider the structure of the coconut price in detail. Our calculation which based on the baht 2.5 per nut does not always hold in reality. First of all, let us consider the past structure of our coconut as shown in the table.

It is clear that the real average price of coconut is far below baht 2.50 as used in our foregoing analysis, standing at the highest around baht 1.50 in 1970. Further analysis reveals that the farmers usually give away the additional 10 nuts to the traders free of charge at every 100 nuts purchase. Therefore, the real effective price must be considerably less than what are given in the table. Moreover, only the large size nuts command better price, if there are assorted sizes, the average price may be very well below the quoted price. In addition, there exists some cost that has not been taken into the account that is the cost of harvesting which goes at a standard ฿10 per 100 nuts harvesting. Taken all these into account, it becomes

clear why the cost of improvement through the proper use of fertilizer is too high such that it does not improve the farmer's final monetary position.

Table 1.16

AVERAGE REGIONAL COCONUT PRICE TREND

(Whole Kingdom)

(Baht per 100 nuts)

Year/Month	1967	1968	1969	1970	1971
January	143.33	136.69	116.61	179.30	138.92
February	140.70	134.24	109.97	171.10	135.27
March	145.86	134.72	114.03	157.26	133.94
April	148.86	139.52	118.15	160.43	130.69
May	140.55	135.58	123.33	159.57	120.00
June	128.25	121.81	116.45	152.35	106.85
July	127.69	127.39	116.14	147.87	106.44
August	122.87	121.56	118.10	135.41	103.97
September	116.25	121.17	131.49	149.11	102.60
October	144.56	119.47	150.22	140.59	106.20
November	133.23	103.12	161.61	144.56	109.71
December	125.98	118.72	162.71	135.37	103.54
AVERAGE	134.84	126.02	128.23	151.67	116.5

Source: Agricultural Economics Division, Office of the Under-Secretary of Ministry of Agriculture.

Table 1.17

AVERAGE REGIONAL COCONUT PRICE TREND

(13 Provinces)

Baht/Nut

Provinces	1972							1973				
	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Rajburi	0.77	0.79	0.83	0.87	1.20	1.49	1.87	2.04	2.11	1.74	1.50	1.22
Cholburi	0.70	0.71	0.81	1.16	1.26	1.37	1.43	1.56	1.58	1.49	1.29	1.07
Phuket	0.70	0.80	0.80	1.10	1.20	1.20	1.50	1.50	1.40	1.30	1.20	-
Chumpon	0.80	0.89	0.96	1.02	1.15	1.26	1.47	1.59	1.66	1.60	1.36	1.20
Prachaub	0.97	0.83	0.93	1.11	1.29	1.63	1.90	2.16	2.04	1.99	1.80	1.72
Narathiwaj	0.84	0.93	1.03	1.03	1.04	1.05	1.06	0.90	0.98	0.97	1.04	-
Surajthani	0.73	0.75	0.85	0.88	0.90	1.01	1.11	1.23	1.37	1.43	1.21	-
Songkla	1.06	1.06	1.07	1.10	1.50	2.00	2.00	2.00	2.00	2.00	1.70	-
Pangnga	1.10	1.10	1.10	1.10	1.10	1.20	1.20	1.30	1.30	1.50	1.	-
Pattani	1.00	1.00	1.00	1.10	1.20	1.60	1.60	1.50	1.50	1.50	1.3	
Samutsakorn	0.58	0.68	0.73	0.84	1.10	1.30	1.88	1.86	1.95	1.83	1.68	1.13
AVERAGE	0.85	0.88	0.92	1.02	1.16	1.34	1.50	1.58	1.59	1.55	1.44	-

Source: Agricultural Economics Division, Office of the Undersecretary of Ministry of Agriculture.

To make the picture clearer, let us calculate the approximate cost of the investment on fertilizer which comes to about ฿928 as a result of investing ฿500, ฿214, ฿214 in the first, second and third years respectively.

The opportunity cost of this amount can be easily calculated as follows, using the annual rate of interest of 8 percent per annum.

1st year	=	40 x 3	=	฿ 120.00
2nd year	=	17.12 x 2	=	34.24
3rd year	=	17.12 x 1	=	17.12
TOTAL				฿ 171.36

By this calculation, the farmers have actually made a lost of ฿171.36-137.20 = ฿ 34.16 if they follow the Treatment I.

Now what will happen if the farmers in question does not have the investible funds at hand and have to borrow? Certainly, they will be much worse off. The market rate of interest is very high around 50-80% per annum if they do not have an access to the commercial bank facilities.

Moreover, the price of fertilizer is not fixed as we assumed in the calculation, but has a tendency to increase with time, as shown in the table 1.18 on Chemical Fertilizer's Price.

Table 1.18

CHEMICAL FERTILIZER'S PRICE

(Baht : Kilogram)

Year	Formula 12:13:17.2 for Coconut	Average All Formulas	Index Average All Formulas
1967	2.94	2.60	104.8
1968	2.71	2.47	99.6
1969	2.59	2.35	94.8
1970	2.59	2.42	97.6
1971	2.65	2.31	93.1
1972	2.71	2.46	99.2
1973	4.16	3.91	157.7
1974*	6.00	6.00	241.9

*Chemical fertilizer price in June 1974.

Source: Agricultural Economics Division, Office of the Under-secretary of Ministry of Agriculture.

Note: Price index calculated by average price of year 1967-1968-1969 as base years (100)

Looking at the overall result of all three methods again, we find that by using method I in which chemical fertilizer is intensively used. Out of four samples, only two farmers, Mr. Janroon and Mrs. Wanida managed to get some profits.

The case of Mr. Jamroon is questionable, his productivity increment was recorded at 45.93 nuts per tree and consequently, his net profit was shown as being ฿1153.6. We question here the accuracy of the data collecting and hence refuse to endorse this finding. For Mrs. Wanida's case, she would not make any profit at all if the price of the coconut is between ฿.50-2.00.

Method II, if pursued, would yield a similar doubtful results.

As to the Method III which was simple and low cost, the outcomes were more definite. None of the four farmers incurred negative profit although on some cases, these profits were less than those using other methods.

In summary, from our economic analysis, we firmly believe that there is not yet a concrete proof or evidence to substantiate the claim that higher productivity through the intensive application of fertilizer benefits the farmer. At the existing market price structures of both coconut and fertilizer, the traditional method normally found practised in Thailand at the moment seems to fit the situation best. In other words, it does not pay to invest in fertilizers.

However, this conclusion is derived purely from the Sawii experiment only and does not mean that in the future, the use of

fertilizer in the coconut industry has to be ruled out. A substantial doubt in the validity of this experiment has to be established when serious policy is to be formulated.

1. The technique of experiment may be improper. Numerous other factors may insert their influences on the yield.
2. Time period covered by this experiment may be too short. A longer period might brighten the issue more.
3. The fertilizer used in this experiment may be improper to plant grown.
4. The data collection and recording may not be accurate.
5. The procedure set may not be strictly followed and hence the outcome may notreflect the working of the true hypothesis of the experiment.

Therefore, what we are trying to say here is that more experiments of different varieties are badly needed to obtain a definite answer of the effectiveness of the fertilizer and to facilitate the government policy in this respect.

However, a definite clue can be found in this analysis that if the price of the coconut is still presently low, while the price of the fertilizer is moving up the scale, the farmers' future in seeking higher income at the mercy of fertilizer is very dim. Without the government intervention to increase the price of the coconut and

to stabilize the fertilizer price, the farmers stand no chance of survival but greater chance of getting worse off and deeper in debts let along the chance of betterment.

1.5 Pest and Disease Control

The coconut plantation in Thailand is relatively disease-free. The only major damage in this respect come from a certain kind of bug notably Rhinoceros beetle and Red Weevil. Generally, these bugs do not cause much problem to the growers except in some particular places in Surat-Thani.[1/] It is believed that the number of these bugs has a close relationship with the number of poultry farms, for bugs breed well in decaying debris and poultry manure. However, the control and preventive methods are easy and well-known to these growers. The use of the standard DDT for insect to prevent breeding and careful disposal of dead trees are all effective. More cautions are placed on the planting technique where only some care is required to nurse the plant up to the size where it is strong enough to survive the damage done by these insects.

1.6 Crop Diversification

There has not yet been a systematic interplanting nor has it enough research thoroughly done on the type of suitable crops for coconut farms in Thailand. Existing interplantings are few in number and they arise from necessity of self dependency rather than deliberate

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1/ Hunting Team Report "Opcit" p. 39.

for commercial purposes. As such, one normally find some perennial crops such as mangoes, durian and mangoesteen grown in the midst of coconut trees in Sawii Island. Grass is grown and cattle are raised in plantations in Songkla. A few other crops normally fruit trees are known to grow well under the coconut shed.

At Sawaii Experiment Station, a research on intercropping has started since April 1973 and scheduled to produce some results in 1975. About 28,080 square-meter plot is used for this purpose wherein various kind of grasses are being experimented together with other perennial fruit trees. It is expected that the coconut farmers' income will be greatly improved if cattle can be grazed in the farm. At the continuously increasing meat price, the government has laid down a policy to accelerate cattle raising for both domestic consumption and for export. Hence, unused surface in coconut plantations has received serious consideration for this venture. However, only a certain kind of grasses can be grown in a shaded area, the plan for cattling will not be realized in the near future until the Sawaii experiment is through and the grass growing technique is successfully made known to all coconut farmers.

Chapter II

MARKETING ANALYSIS

Marketing is said to be the heart of agriculture. Without good marketing system and strategies, farmers will never secure high enough income to maintain a reasonable standard of living. The fact that most of agriculturists in developing countries are still among the poorest people, is because their productivity cannot command high enough payment. The reason is clear, because farmers in these countries are typically very poor marketers and the available facilities provided by the government are far less than adequate for them to dispose their produce at a reasonable price.

Coconut marketing like other agricultural products, is a complex operation. The price is firmly under the control of middlemen who exist in a spectrum of layers, producing a chain of transactions starting from the growers until the ultimate consumers - a process in which contains many sub-markets. Most of the time, the farmers are only price takers at the level so far less than the retail price. The reason why coconut plantations in Thailand are of low quality and less proliferating can be partially found in the marketing process. In this Chapter, we will look closely to this activities of marketing and pricing practices.

2.1 Marketing Characteristics

We will follow the market classification made by the

Ministry of Agriculture[1/] as a guideline for our analysis. Therein three markets are categorized.

1. local grower's market
2. assembly wholesale market
3. terminal market

2.1.1 Local Grower's Market

The local grower's market is normally located in villages where coconut plantations are predominant such as in Sawaii district, Chumpon Province, etc. The marketable goods are generally in crude form and non-processed such as fresh nuts and copra. This type of market is characterized by informal arrangement and irregular price setting depending on individual bargaining tactic and preference. The communication facilities from this market to other business centers in big towns are very poor and also very costly. Middlemen who buy goods from the farmers are not the entire single linkage between producers and final consumers, as they nearly always resale these goods to another group of traders in other markets known as the assembly wholesale market. No retail trade for coconut exists in the local market level as most of the inhabitants are coconut growers themselves. Traders in this market are operating under a limited financial availability, seeking high rate of profit from the small amount of working capital. However, the price transacted is determined by the demand and

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1/ Ministry of Agriculture, Office of Undersecretary of State, Agricultural Economics Division.

supply in other market. Hence, these traders are acting as a transmitting channel between outside forces and the farmers. If the price they get from other markets is high because the demand is high, the farmers are likely to get a share of this fortune but the relative amount is rather disproportionate to the middlemen windfall gain as the result of high coconut price elsewhere.

2.1.2 Assembly Wholesale Market

A more functional-like market is found in a bigger business communities in bigger towns which can be termed "assembly market". It deals directly with either farmers or traders from local markets. As most of the farmers realize that they can get a better price for their product if they can sell directly to bigger traders in town but not all farmers can possibly do so due to the lack of some facilities such as transportation and money. But for bigger farmers who are a little more sophisticated they normally deal directly to the wholesalers. Recently, a successful attempt has been made to organize farmers into a grower cooperative to cut down the middlemen cost especially to the small farmers. The assembly market are well equipped with transportation facilities such as boats and big trucks and adequate capital funds. Firms in this market are known as "Paa-Ma-Prao" or "Long-Ma-Prao." Some of them are partners or agents of Bangkok wholesale traders. They live in big towns and have permanent office. With modern communication equipment, their linkages to other related businesses are more thorough

in such a way that they know the behavior of the entire market very well. They deal with coconut-base industries such as candy, fat soap, milk and margarine manufacturers in other part of the country. Their networks are more complete and some of them have access to foreign markets as well. Prices in this market are systematically set and can be used as the market indicator for they vary directly with the condition of demand of the entire markets.

2.1.3 Terminal Market

This market may be defined the center of assembly market. The only difference is the size of network. It is the market place for all kinds of people such as wholesalers, retailers, manufacturers and exporters. Most of the voluminous products come from various middlemen in the upcountry assembly markets. Goods are brought into these markets in big quantity for the national-wide distribution. Linkages to all associated business are most complete. Bangkok terminal markets are the biggest and most influential traders in this market, are the ultimate coconut prices fixed. Commodities standard and grades are regulated by this market. It is believed that more than 80 percent of the entire coconut and the related products is done through this market where the rest are made through the direct deal with local assembly markets.

2.2 Fresh Nut Market Structure

Good coconut dealers require a certain degree of skill and

experience which come only with the length of time they spend on the business. Selection of coconuts and pricing them correctly need much more judgment than the mere physical appearance of the nuts. The quality of coconut is not easily visible, for example the thickness of the fresh nut, the quality of such freshness of which depending on its ripeness and so on. According to the Survey[1/] which covered 13 provinces, the highest number of dealers had experience of between 6-10 years, those who had been in business longer than 20 years were few, i.e., only 8 out of the total of 136 dealers. From this survey, we spot one fact that the prosperity in coconut trade does not have a long history as one might think but proliferated during the past decade or so only. Table below shows the distribution of dealership by experience.

If we examine these fresh nut wholesalers according to the market-type classification, Table 2.2 provides us a fairly complete picture.

Out of 150 wholesalers in 13 provinces, 84 are in local grower's market and 64 are in assembly market. Chumpon has the highest number of wholesalers, i.e., 35, 27 of which are in local growers market and 18 in assembly market. Next come Samut-Songkram, numbering 27 and followed by Prachuab Kerikan which has 23 of them. Bangkok comes fourth with respect to the highest number of fresh nut dealers

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1/ Conducted by the Agricultural Economics Division in June 1972-May 1973.

Table 2.1

BUSINESS EXPERIENCE YEARS OF COCONUT WHOLESALERS IN 13 PROVINCES

(Survey Period June 1972-May 1973)

Years	Number of Wholesalers	Percentage
1-5	45	33.08
6-10	56	41.17
11-15	10	7.35
16-20	17	12.50
21-25	1	0.74
26-30	4	2.94
31-35	1	0.74
36-40	1	0.74
Over 40	1	0.74
Total	136	100.00

Sources: Division of Agricultural Economics
Study Report of the Coconut Marketing

Table 2.2

AMOUNT OF WHOLESALERS IN LOCAL GROWER'S MARKET AND ASSEMBLY WHOLESALE MARKET

Provinces	Local Grower's Market	Assembly Wholesale Market	Total	Number of Wholesalers in District
Bangkok	-	19	19	Dusit (7) Pranakorn (9) Yarnnava (1) Patumvan (2)
Chonburi	8	6	14	Muang (6) Banglamuang (7) Sriraja (1)
Nakorn-Patom	-	3	3	Muang (3)
Rajburi	5	1	6	Watplang (1) Dumneansaduag(4) Muang (1)
Samut-Songkarm	16	11	27	Ampawa (11) Bangkonte (16)
Prachaub	13	10	23	Tubsakae (10) Bangsapan (13)
Chumpon	27	8	35	Muang (8) Pratew (6) Langsuan (10) Sawii (10)
Suratani	6	2	8	Muang (2) Sawii (6)
Puget	2	1	3	Muang (1) Talang (2)
Pang-nga	1	-	1	Takuopa (1)
Pattani	2	-	2	Saiburi (2)
Songkla	-	3	3	Hard-yai (2)
Narathiwat	6	-	6	Bajao (5) Sungai kolok (1)
Total	86	64	150	28 Districts

Source: Division of Agricultural Economics
Study Report of Thai Coconut Marketing p. 25.

with 19. However, according to our classification, all of these 19 wholesalers may be said to be in the Terminal market with large size of activity.

Note that Chumpon which has the highest number of wholesalers is also one of the most commercialized center as well as one of the largest coconut growing area. Surathani on the other hand is also one of the biggest coconut growing province but due to her shortages of good transportation facilities, she does not become large commercial center. Thus the number of wholesaler is not that numerous.

To understand the size of business in different places Table 1.11 is what we need.

As stated earlier, Bangkok market is the largest and have to be classified as being the terminal market for out of 19 wholesalers, 14 of them have normal dealing with over 14 million and some time several million fresh nuts in one year. Apart from Bangkok, Prachuab and Chumpon may be said to have some terminal market for fresh nuts judging from the volume of their business. However, on average, the normal size of business is in the order of 100,000 - 300,000 nuts per year which account for 38 percent of the total dealership.

Table 2.3 shows the structure of coconut dealers or wholesalers in further details. Over 97 percent of these wholesalers are single owners only few are partnerships. Of all this, 50.74 percent of the wholesalers deals with fresh nut trade only but the rest, i.e.,

Table 1.11

NUMBERS OF FRESH NUTS WHOLESALERS CLASSIFIED BY VOLUME OF BUSINESS PER YEAR

Unut: Nuts

Provinces	100,000	100,001 300,000	300,001 500,000	500-001 700,000	700-001 900,000	900-001 1,100,000	1,100,001 and Over	Wholesalers
Bangkok	-	-	2	1	2	-	14	19
Cholburi	4	7	2	1	-	-	-	14
Rajburi	3	1	1	-	-	-	-	5
Samutsongkram	11	14	1	1	-	-	-	27
Prachuab	1	7	9	1	3	-	2	23
Chumpon	11	15	3	-	-	1	-	30
Surat	2	5	1	-	-	-	-	8
Puget	-	3	-	-	-	-	-	3
Pang-nga	1	-	-	-	-	-	-	1
Pattani	-	-	1	-	-	-	-	1
Songkla	1	-	-	-	-	-	-	1
Naratiwat	3	-	-	-	1	-	-	4
Total	37	52	20	5	5	1	16	136
Percentage	27.20	38.23	14.71	3.68	3.68	0.74	11.76	100

Source: Division of Agricultural Economics

Table 2.3

KINDS OF BUSINESS OF FRESH NUTS WHOLESALERS IN 13 PROVINCES

(June 1972-May 1973)

Series	Provinces	Single Owner	Fresh Nut Trade Only	Percentage	Fresh Nut Trade and Others	Percentage
1	Greater Bangkok	15*	16	92.11	3	7.89
2	Chol-Buri	14	9	41.43	5	8.57
3	Nakornpathom	3	3	100.00	-	-
4	Rajburi	6	5	91.76	1	8.33
5	Samut-Songkram	27	20	89.93	7	10.07
6	Prachaub	23	3	70.93	20	29.04
7	Chumpon	29	10	73.28	19	26.72
8	Surat	8	4	91.25	4	8.75
9	Puget	3	-	40.00	3	60.00
10	Pang-nga	1	-	10.00	1	90.00
11	Pattani	1	-	50.00	1	50.00
12	Songkla	1	1	100.00	-	-
13	Narativat	4	1	71.25	3	28.75
	Percentage	97.06	50.74	72.66	49.26	27.34

*Greater Bangkok traders - 15 are single ownership and only 4 are partnership.

Sources: Division of Agricultural Economics, "Study Report of the Coconut Marketing" pp. 17-18.

49.26 percent are involved in other kinds of business at the same time. Other businesses are here defined as cobra trading, miscellaneous commodities, upland crop trading and construction.

2.3 Copra-Market Structure

Generally, coconut farmers sell their products as fresh nuts which can command better price than other kinds of products. Therefore, copra production provides for only a small fraction of the total income. Only undersized nuts or broken nuts are used for this purpose which naturally produce a low quality of copra. Copra market is not really complex or highly competitive as the fresh nut market. Very often, farmers sell copra directly to the local oil manufacturers. However, for a big quantity user, constant supply and in big lot may be needed for convenience, they prefer buying from the wholesalers to directly buy from individual farmers.

The structure of copra market and characteristics of its dealers are very much similar to those in fresh nut trade.

According to Table 2.4, 35.50 percent of the total copra wholesalers are in business less than 5 years whereas the rest with different length of experience are seen quite evenly distributed. The different numbers of traders before and during the survey years indicates the decline in the relative importance of copra trade in Thailand. Not only that the absolute number of wholesalers is less than those in the fresh nut market but the volume of business is also dropping.

Table 2.4

YEARS OF EXPERIENCE OF COPRA WHOLESALERS

Years	Percentage	No. of Wholesalers Before Survey	No. of Wholesalers During the Survey
1 - 5	35.50	13	6
6 - 10	18.75	6	3
11 - 15	18.75	6	3
16 - 20	12.50	4	2
21 - 25	12.50	4	2

Source: Division of Agricultural Economics

Table 2.5 shows the distribution of copra dealers by location which reveals that Chumpon is still the biggest copra trading center where the number of dealers remains at 9. Narathiwas and Sura-Thani are facing with a market shrinkage when their dealerships has reduced from 9 and 8 to only 2, respectively. There is one reason attributing to such a decline. During the survey years of 1972-1973, the price for fresh nuts was good producing a shortage in copra production which manifest itself in terms of market slump as shown in the Table where the total number of wholesalers was reduced from 33 to 16.

COPRA MARKETING STRUCTURE

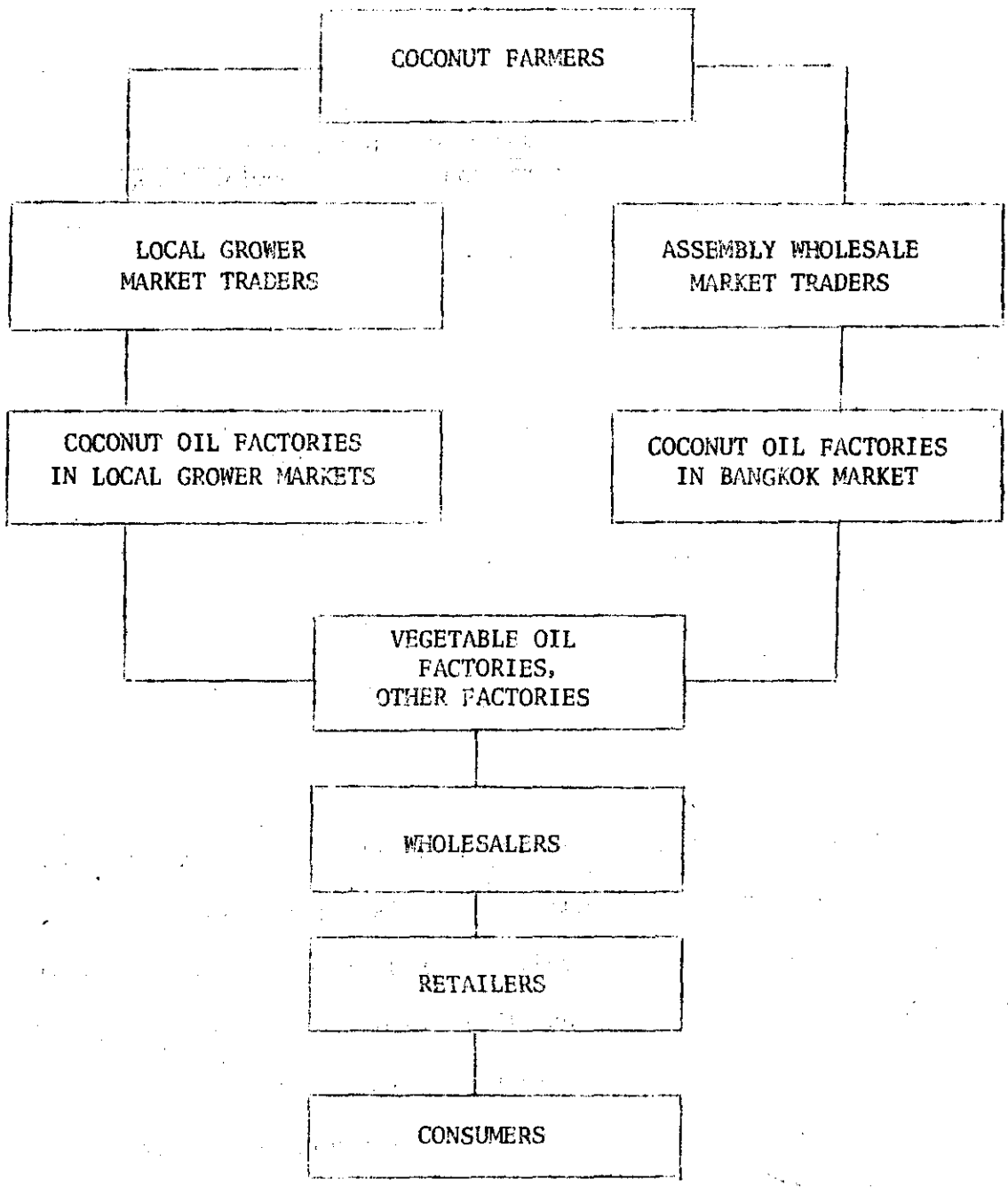

Table 2.5

AMOUNT OF COPRA WHOLESALERS IN VARIOUS PROVINCES

Provinces	Number of Copra Wholesalers	
	Before Survey	During Survey
Chumpon	9	9
Narathivas	9	2
Surat-Thani	8	2
Pattani	6	2
Nakorn-Sri-Tham-Raj	1	1
Total	33	16

Source: Division of Agricultural Economics

Table 2.6 illustrates the similar pattern of copra trade to that of fresh nut trade. As copra business is not promising, most of the wholesalers do not stick to only one product but have to deal with other product as well to supplement their income. As shown, the percentage of those who deal with copra alone as against diversified traders are 57.13 and 41.87 respectively. Moreover, most of them are in a relatively small business of less than 50,000 nuts.

Table 2.6

AMOUNTS OF COPRA WHOLESALERS CLASSIFIED BY VOLUME OF BUSINESS PER YEAR AND CHARACTER OF BUSINESS

Provinces	Copra Business (%)	Other Business (%)	Volume of Copra Business				Number of Traders
			50,000 and under	50,001 98,999	99,000 149,999	150,000 245,999	
Chumpon	46.67	53.33	5	3	-	1	9
Narathivas	45.00	55.00	2	-	-	-	2
Surat-Thani	55.00	45.00	2	-	-	-	2
Pattani	44.00	56.00	1	-	1	-	2
Nakorn-Srithamraj	100.00	-	1	-	-	-	1
Percentage	57.13	41.87	68.75	18.75	6.25	6.25	100
Total			11	3	1	1	16

Source: Division of Agricultural Economics.

11.4 Coconut Oil

A closely related product to copra is the coconut oil. Actually, coconut oil in Thailand can be produced by using two different input. The high oil is normally a by-product of copra but the lower grade one is extracted from grated coconut meat after the milk has been removed for other uses thus, it is much cheaper. Low quality oil is used not for consumption but rather for manufacturing of soap and paint.

Table 2.7

NUMBER OF OIL MILLS

Province	Number
Bangkok	2
Samut-Prakan	2**
Trang	2
Nakornsrithamraj	1
Songkla	2
Pattani	4
Surat-Thani	3
Yala	1
Phuket	2
Narathivas	4
Nakornpathom	3
Total	26

Up to the end of April 1974, there were 51 oil mills registered to the Ministry of Industry. These oil mills were all using copra as raw material, thus producing high grade oil. Those which produce lower grade oil are believed to be numerous but they were not legally registered as most of them were home-made type and their exact locations were unknown. During 1973-74, copra price was very high as a result of high fresh nut price, most of the oil mills made sizeable loss and some of them were forced to close down thus giving a chance for low grade oil producers to expand. Most of these low grade oil extractors were known to concentrate in Nakorn Pathom and around Bangkok areas.

In 1973-74, when the Survey was conducted only 26 mills were found, 2 each were in Bangkok, Samut-Prakan. Trang and Songkla, 4 each were in Pattani and Narathivas, 3 each in Surat-Thani and Nakornpathom and 1 each in Nakornsrithamaraj and Yala.

These 26 oil mills together used 28,835,383 kg. of copra producing 15,901,677 kg. of oil and 12,135.93 kg. of coconut cakes with the quantity losses of 979,776 kg. in the process of extraction. This means out of a given copra input, the percentage compositions of transformation, by weight is 55.15 percent for oil, 42.09 percent for cake and 2.76 percent for losses.

The details of production and the locational distribution of productive capacity are clearly shown in Table 2.8.

Table 2.8

PRODUCTIVITY CAPACITY OF OIL MILLS LOCATION

(During July 1973-May 1974)

Provinces	Copra Used	Coconut Oil Produced	Coconut Cake Obtained from Oil Production	Lossing Quality
Bangkok	15,995,758	8,797,886	7,143,327	54,545
Surathani	4,427,207	2,375,200	1,722,188	329,829
Narathivas	3,088,826	1,837,821	1,160,972	90,033
Pattani	2,740,108	1,504,770	1,090,131	145,207
Nakorn-Srithamraj	909,091	500,000	381,818	27,273
Yala	669,643	375,000	254,464	40,179
Phuket	513,597	259,000	189,787	64,810
Songkla	384,000	192,000	153,600	38,400
Trang	107,143	60,000	39,643	7,500
Total	28,835,383	15,901,677	12,135,930	797,776
Percentage to 100 kg. of copra	100%	55.15%	52.09%	2.76%

Source: Division of Agricultural Economics.

The figures in Table 2.8 are based on 239 days and if we convert them into an annual basis, the total output for oil will come up to 22,980,855 kg. instead of just 15,901,677 kg. as shown in the table. Bangkok (including Samut-Prakan) is the largest production area where 8,979,886 kg. of oil was produced in 1973/74.

2.5 Marketing

2.5.1 Buying Process

Fresh Nuts

Marketing process for fresh nut varies from place to place depending mainly on the law of supply and demand. In areas where coconut farms are numerous, producing a substantial amount of coconut and the number of traders is large, buying is competitive, the price is fair and services to the farmers are reasonable in terms of transportation and other advice. Fresh nuts are traded in 3 sizes, large, medium and small, and priced accordingly. Very often, two small nuts are priced equal to one large nut. However, if farmers are not bound by any contract or other obligation, they will not normally sell small nuts to these traders since the price is low. Rather, they prefer keeping for copra input. In the areas where traders are few, the advantage is with traders. They are price setters and contributes minimal services to the process of marketing. Transportation has to be provided by the farmers and sometimes only huskless nuts are accepted. In some places, single price system, regardless of sizes, are operated

but this practise is confined only in areas of inconvenient communications and quantity produced is small. In this case, traders are highly powerful in price setting.

Services to farmers in the marketing process can be used as a measurement of competitiveness among traders. For example, in the provinces where transactions are substantial and competition is keen services is good.

Table 2.9

SERVICES TO FARMERS

	Percentage of Traders Giving Services to Farmers	Percentage of Farmers Selling at Traders Places
Samutsakorn	93	7
Chumporn	74	26
Prachaubkelikan	80	20

However, in Bangkok only 5 percent of the wholesalers go out and buy coconut from production areas. This is because the market in Bangkok is of either assembly or terminal market where quantity traded are large, hence, they buy from anyone at a quoted price. Therefore, the concept of competitiveness as measured by services to farmers cannot be applied here.

Price structure for fresh coconut are determined by:

1. the demand of the market as a whole at any particular time.
2. quality of the nut itself.
3. collusion among different layer of coconut traders or the degree of monopolistic power in the locality.

Copra

Copra is a home industry type, produced from small or broken nuts which cannot command good price if sold as fresh nuts. Substantial copra supply comes from big coconut planting areas such as Surathani and Chumpon. The marketing practice varies from place to place. Small farmers who produce only small quantity of copra have to sell it to the traders' offices. Only in the big producers case do traders provide transportation service at the producers' doors.

Price structure for copra is dominated by Bangkok wholesalers and oil millers in big cities transited down to local traders level. Generally, the method of price determination are:

1. 57 percent of copra is traded under a quoted price from Bangkok.
2. 4 percent of copra is priced according to Singapore price, but this only happens when traders have some connection with foreign markets.
3. 26 percent of copra is priced strictly according to its quality and moisture content.

4. 13 percent is priced according to the pattern of the coconut oil price.

2.5.2 Selling Process

Fresh Nuts

Selling of fresh nuts of the traders can only be made in the form of huskless or peeled nuts. This means the peeling cost has to be borne by the wholesalers themselves.

Most of the wholesalers, 76 percent of them, sell their products at their places while the remaining sells them at Bangkok market which accept only large quantity deals, ranging between 500,000 - 1,000,000 nuts per year. Therefore, Bangkok market supply comes from Samutsongkarm, Prachubkerikun, Chumpon and Surathani.

As far as transaction is concerned, assembly wholesale market traders sell 62 percent of their inventory to customers at terminal market. The rest is sold to provincial traders from areas where coconuts are not grown or under-produced. All of the transactions are made in cash and only in some special cases or circumstances do the wholesalers grant credit to their customers.

Selling to Bangkok terminal market of local wholesalers runs opposite to the above Bangkok trader do not usually pay them in cash but with installment or whatever method they might agree upon. It is so, because in the past the market price for fresh coconut has shown a clear tendency of falling and the local traders do not want to hold a

large stock of inventory, hence, they are likely to be handicapped. Therefore, in the actual practice, 81 percent of the transactions are paid by installment, 17 percent are paid by a forward advancement of a certain lump sum amount and only 2 percent are paid by cash on delivery.

Copra

Most of the copra, i.e., 52 percent, is sold directly to local oil millers and the rest, 42 percent goes to Bangkok market. Actually, local traders can get a better price for their copra if they sell it to Bangkok wholesalers. However, due to some barriers and conveniences, they have to be contented with a lower price. Time element, storage, communication are all having a part in the process of selling which help to lessen the profit of local traders if they are to sell their product at the distant Bangkok market. (Bangkok market is herein defined as a terminal wholesale middlemen). If local traders can sell their copra directly to oil millers around Bangkok, they will get better price. But again, oil millers buy only in big lots which cannot be supplied by small traders.

Copra market is a 'buyer market' whereby its price is at the command of buyers. This price is a 'derived price' based on the market conditions in the final product market. In this case, it is the coconut oil market.

However, the structure of copra price depends partially on its quality. Copra from Sai-buri district, and Pattani Province is of high quality, thus always command higher price than copra from other place.

Copra trade is largely conducted on cash basis as this accounts for 82 percent of the total transaction, the rest, 12 percent is transacted on the installment basis.

Up to the present, the copra price has shown the tendency to increase, implying the rising demand of the oil millers.

Coconut Oil

Local oil mills upcountry, sell their products to Bangkok terminal oil traders or other oil mills in Bangkok. In terms of price, it is set by local oil millers themselves basing upon the cost structure and the prevailing market conditions. World market price is also taken into the consideration since the domestic price has to be competitive enough to survive against imported oil. Another crucial factors determining its price is its own quality. Since the coconut oil customers range from manufacturers such as soap industry to edible oil millers.

Fine grade oil is sold mainly to edible vegetable oil millers who are subject to certain regulations. According to Article 13 of the Public Health Act, vegetable oil is not edible if:

1. it contains more than 4.0 milligram of potassium hydroxide per one gram of oil.

2. it contains more than 10 milligram of peroxide per one kilogram of oil.
3. it contains over 0.2 percent of its weight of water or any evaporators at 105°C.
4. it has soap content over 0.005 percent of its weight.
5. it contains insolvable impurities over 0.05 percent of its weight.

If it is found that coconut oil from oil mills is not suitable for edible oil production, it will be rejected or offered "very low" price because it will have to be further refined.

For other coconut oil manufacturers such as soap producers or wood paint industry, this problem does not occur since they normally use low grade oil.

In terms of payment, 72 percent of the transactions are paid in cash, 26 percent by installment and the rest by credit.

2.5.3. Role of Middlemen

Middlemen play an important role in the coconut industry. From the growers to final consumers involve a long process of complex negotiation, bargaining and price setting. It is indeed a competitive market with the existence of a large number of sellers and buyers at each layer of transaction. As we have earlier classified, market structure into 3 layers, local trader, assembly wholesale market

and terminal market, these traders are collectively acting as a middleman bringing the suppliers (growers) to the final consumers. However, different groups of trader at each layer have different means of setting prices for their products. As seen in table 2.10 the methods of pricing are diversifying. Some 23.65 percent of middlemen use the prevailing Bangkok prices as their criterion, 15.86 percent of them use the current provincial price as the base, 25 percent price their product locally according to the existing condition. The most popular criterion for pricing is quality pricing, i.e., the quality of the product is the most important factor. This quality pricing accounts for 35.81 percent of the total traders.

Table 2.10

PRICING METHOD

Setting Methods	Percentage
Bangkok Price	23.65
Provincial Price	16.86
Local Marketing	25.00
Quality of Product	35.81
Others	0.68
Total	100.00

Source: Ministry of Agriculture.

It is true that middlemen take away a substantial share of income generated during the transaction process thus unnecessarily increasing the cost to the final consumers and reducing income of the growers and that if a direct sell from growers to final consumers is made this middlemen's share will have to fall on both parties. However, we should not forget one fact that "trading" like other activities can only be performed efficiently by experts. As far as coconut products are concerned, this trading process involves marketing technique, transportation, storage and most of all finance. We may envisage this activity as the equilibrating factor of the demand and supply. Hence, what is expertly done by the professionals may not be done as efficiently and cheaply by other. If there is no middleman, who will perform these complex function? Farmers or final consumers are all experts in different fields and they might not after all be able to reduce the middleman cost which seems at the surface unnecessary if they actually engage in these activities themselves. Therefore, in the final analysis, the middleman's function still remain useful as long as the free-enterprise exists.

However, it is still true that traders are having such a higher bargaining power than the producers in the coconut industry. A few reasons can be given.

1. Most of the coconut growers are poor, holding only a few acres each - thus they are not in the position to demand anything much from traders.
2. Most of the farmers are not well educated and do not know or understand the change of demand condition in the market.

3. Farmers are very much handicapped in terms of finance and normally have low credit standing with commercial banks.
4. There exists no strong growers organization or growers cooperatives to strengthen their bargaining power.

Hence, with these handicaps, coconut growers are always put into a disadvantageous position when trade takes place. Copra trading is also working to the disadvantage of the producers especially when the quality evaluation is concerned. Moisture-free copra usually command the best price, but this rarely happens because traders always evaluate it as having 10 percent moisture content and hence, price it much lower than its real value.

The only means to prevent this kind of exploitation is to build up a countervailing power against the middlemen. Some kind of a farmers organization must be quickly organized to take care of the marketing activity to neutralize the bargaining power of the middlemen. Present cooperative system may be useful but its efficiency and seriousness have to be reconstructed.

2.5.4 Marketing of Processed Coconut Products

Processed coconut products come in many forms, they are:

1. copra
2. coconut oil
3. coconut cake
4. sun-dried coconut milk cakes
5. coconut fibre

As mentioned earlier, coconut industry in Thailand caters mainly for fresh nut market and processed coconut products account for only a fraction of the market. Such a lack in product diversification is certainly one of the reasons that keeps coconut industry in Thailand from a rapid development. For example, the finding of the Coconut Research Centers at Surathani, Sawii and at Phuket reveals that out of 1.6 kg. of an average size coconut, 330 grams go to husk which can be processed to coir fibre, weighs 180 grams worth about ฿0.35. Its shell can also be turn into crude carbonized charcoal which is worth ฿0.028.[1/]

At the moment, coconut ibre in Thailand is of a low standard. The average length of the fibre is 5-15 cm. which is suitable for mattress production which is valued at only ฿1.50-2.00 per kg. Technically, bristle fibre can be produced in Thailand only if the market is large enough to cover the cost of new modern machines.

In 1972, Thailand exported 2075 tons of coir fibre at the value of ฿6.5 million and produced for domestic consumption about 300 tons at the value only at ฿450,000. Our principal importers were Japan, W. Germany, Spain, France, Italy and the U.S.A.

However, these magnitudes are still unfortunately too small for the amount of coconut Thailand is capable of producing annually. Too much waste is found in that the husk and the kernel are used only

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1/ M. Moritomo, UNIDO.

Table 2.11

QUANTITY AND VALUE OF EXPORT OF COIR FIBER: 1960-1974

Quantity: Kilogramme
Value : Baht
Export : FOB Value

	1960	1961	1962	1964	1965	1967	1968	1969	1972*	1974*
Penang	25,100 (18,882)						12,600 (12,695)			
Belgium		20,421 (21,434)		10,176 (31,204)						
Denmark		5,181 (6,183)				38,405 (49,228)	51,133 (165,483)	10,710 (35,166)		
France		87,787 (192,790)		443,137 (715,916)	91,440 (131,694)		10,417 (27,610)			
West Germany		67,821 (137,226)		1,477,755 (3,863,725)	1,088,451 (3,614,573)	25,442 (75,727)	932,469 (2,725,341)			
Italy		112,032 (126,472)		285,791 (851,840)	548,949 (1,764,591)		10,179 (30,840)			
United Kingdom		241,974 (514,756)		30,736 (43,646)						
Gibralta				10,008 (39,635)	1,981 (3,401)					
Netherland				93,594 (145,763)		1,440 (7,752)				
Japan			10,275 (36,628)	37,308 (135,300)	20,065 (77,709)	35,775 (88,680)	105,837 (2,869,666)	72,870 (192,109)		
South Africa				11,278 (19,715)	15,264 (51,147)					
U.S.A.					1,680 (9,298)	6,300 (30,925)				
New Zealand					10,000 (17,472)					
Spain						15,265 (48,008)	30,018 (84,837)	35,780 (117,382)		
Taiwan						10,000 (37,440)	16,600 (60,320)	5,625 (21,060)		
Total	25,100 (18,882)	535,216 (908,861)	10,275 (36,628)	2,399,833 (5,847,246)	1,777,830 (5,569,890)	132,627 (337,760)	2,122,253 (5,976,692)	124,925 (365,717)	2,075,500 (6,510,013)	220,032 (8,078,388)

Source: Department of Customs, Bangkok

* No data available by country.

for burning substance, i.e., fuel and only little amount goes to manufacturing inputs.

Only if we can diversify these coconut products wisely, will this industry be definitely be in a better shape than it is today. Counting on 25 million nuts of coconut production we are capable of 3600 tons at the value of ₱13 million of coir fibre can be produced. Moreover, with the same amount of coconut, we can utilize its kernel for the production of carbonized charcoal which would amount to about 700 tons and works something like ₱0.69 million.

Therefore, the product diversification is urgently needed and assistance from the government is necessary to increase the welfare of the coconut growers as well as to accelerate growth in this industry.

2.5.5 The determination of quality

Fresh Nuts

Fresh nuts are normally classified according to their quality which depends on

1. size
2. type
3. weight

With respect to the size, three classifications are made - large, medium and small. There is no rigid definition of what is large or small in actuality. The measurement is quite arbitrary in most cases

and a rule of thumb is applied. In certain areas such as in Bang-Chang, if a coconut is 5 spreading hand length in its circumference it is a large size, 3 hands is a medium size and less than 3 hands is then classified as small. In other places, the measurement is less systematic and the relative sizes are used. This relative size system varies from year to year in such a way that large size nut last year may be classified as a medium size this year if most of the nuts this year are on average larger than they were last year.

Quality of coconuts also depends on its type. Coconut from some particular place may very well command higher price than those from other place. Some types are more popular than others, for example Tubsaka and Prachuab coconuts are more favorable to Bang-Chang and Samutsakorn nut due to its unique taste.

Weight of the nut is also used as the quality indicator since larger size nuts do not always mean thicker meat. The same size nuts may very well priced differently if their weight are different. Thicker meat nuts are usually heavier than thinner meat nuts of the same size.

Therefore, to determine the quality of the coconut, these three criteria are usually taken into account. However, not all measure are simultaneously employed in the actual practice but the size classification is always the most important quality indicator.

Copra

The quality of copra depends largely on the maturity of coconut.

Fully matured nuts make good copra. The method of copra quality evaluation is quite simple. Good copra is dry and easily broken since it is made of fully matured nut. The inside must be clear, shining and oily looking. The inner side which is close to the kernel must have a dark color, and the outer side must be white and fungus-free with no dirt or foreign elements visible. This is the premium quality, sold at the highest price. The second grade copra has a high moisture content or made from immature nuts. When sun-dried or heat-dried will show a kind of red brown color. It is soft, hard to break and normally dirty. Hence its price is much lower since traders will have to incur more cost of cleaning and further drying it before storing.

Oil millers are very particular about the quality of copra. If it has more than eight percent moisture content, the extracted oil will have high water mixture which cannot be kept long since it will turn sour and have unpleasant smell. Copra from Sai-Bury is regarded to have a high quality because of its dryness having less than six percent moisture content and dirt-free.[1/]

Coconut Oil

The coconut oil extracted from fresh copra is considered a high grade oil. The lower quality oil is produced from dry grated coconut after its milk has been removed. This crude oil is not yet edible, it has to be further refined to obtain more purity. This refined coconut

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1/ Agricultural Economic Division, Ministry of Agriculture.

oil is used for cooking, sweetened-milk and margarine. The lower grade oil is used for soap production and wood paint.

2.5.6 Transportation

Coconut production is unique in many ways.

1. It is seasonal.
2. Each farm produces only a small quantity and scattered over a large area.
3. Its quality depends on the weather conditions and hence, fluctuate quite widely from season to season.
4. It is bulky.

Therefore, a good network of transportation is necessary to increase the overall productivity of the entire industry. However, the fact is transportation in Thailand is still inadequate and inefficient to render services to the industry at an economical cost.

Land transportation by road and rail are the most common practice but other means have proved to be less expensive in some areas such as by river or by sea, but again, transportation through waterways depends very much on season which regulate the water level.

The most obvious drawback is found in the under-developed means of loading and unloading cargo. Modernized equipment to handle this task is indeed insufficient causing unnecessary delays and damages. Hence, this is one of the first priority areas needed to be improved.

Transportation of Fresh Coconut

Since fresh nut cannot be kept long, huskless nuts can last only about seven days, therefore, they must be brought to the market within a reasonably short time to prevent deterioration of quality. Presently, transportation by road accounts for 71 percent of all means, by rails takes care of about six percent and the rest 23 percent is done through waterways.

Normally, transportation cost is borne by the middlemen who go directly to plantations to collect their cargo and deliver it to the market in other areas, usually Bangkok. This transportation expenses account for 8.34 percent of the total selling cost.[1/]

Transportation of Coconut Oil

Transportation of coconut oil from local oil producers to refinery in Bangkok is made mostly by boat since it is bulky and less expensive. Crude oil comes in drums of 200 litres size. It takes between 5-7 days from the place of origin-Surathani to Bangkok.

Considering the cost structure of marketing reveals that on average transportation cost weights heaviest of all. This is not surprising since it involves distances between the production point and the final consumers' market of which the biggest is Bangkok. For copra, the

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1/ Agricultural Economic Department, Ministry of Agriculture.

Table 2.12

BREAKDOWN OF ALL MARKET COST

(Percent)

Item	Fresh Nut	Copra	Oil
Labor Cost	6.73	2.60	0.77
Transportation	8.34	1.87	1.59
Office Expanses	6.64	2.04	1.06
Container	0.98	0.68	
Taxes	0.84	0.36	0.44
Interest	0.39		
Other Fee	0.06	0.17	0.06
Commission			0.71
Petrol and Oil			0.59
Chemical Inputs			0.34
Depreciation			0.72
Insurance			0.36
Electricity and Water			0.17

Source: Department of Agricultural Economics.

labor cost is much higher than the transport cost. This is because most of the markets for copra, i.e., local crude oil producers, are located near the plantation. It has a high labor expenses because of the nature of copra production in Thailand which is quite labor-intensive process. These facts are confirmed when we consider the cost component of coconut oil in which transportation is most important item. It is so, because, oil extraction is relatively capital-intensive than others and its markets, i.e., refineries, are around Bangkok area, far away from the original place of production.

In summary, even though the government has planned to develop means of communication in the South, it is rather definite that it will not be able to cover the entire coconut planting area. This defect in transportation network will still remain and the chance for this industry to develop itself to an efficient and systematic production unit capable of generating a large stream of income to all parties concerned is very much doubtful. The lack of good transportation process is a constraint to the rural development and the prosperity of the farmers.

2.5.7 Inventory Practice

Fresh Nuts

After collection of fresh nuts from the plantations, the husk will have to be removed at the cost of 5 baht per 100 nuts. If the nuts are nut fully matured, the fibre around the actual nut after the husk has been removed is of white or pink colors. They will have

to be sun-baked to blacken its color in order to be sold at a higher price. This method of premature coconut harvesting and sun-bake process are popular among Samutsakorn growers since they are short-cut to a quick cash income.

Inventory is done in both fresh nut form and huskless form for various reasons.

1) Traders keep inventory simply because the amount of coconut at a particular time is not large enough to transport it to the market economically. Cheap transport cost can be had only with large volume. This motive of building up inventory account for 38 percent of all other reasons.

2) They keep inventory purely for price speculation. This motive accounts for 25 percent.

3) There exists also an involuntary inventory built up because of the shortage of demand at a satisfactory price. This occurs with 17 percent of the reasons.

The length of inventory varies. Some keep it as long as 45 days but this must be coconut of high quality, fully ripe and unbroken. But on average, fresh nuts are not normally kept longer than 20 days on average. But if the husk is removed, they cannot be kept stored for more than 7 days.

Storing fresh nuts needs some care, the storage must be covered with roof and well ventilated to prevent heat and moisture to build up.

Too much moisture matures the nuts and too much heat cracks them. However, the loss incurred from storing varies with its length. On average, the damage occurs at around 5-10 percent due to crack, decay and animal bites.

Copra

It has been long the practise of trader not to sell copra right away after its production process is completed. About 63 percent of copra traders do hold some inventory of copra. The reasons cited are:

1) 22 percent of traders have an upward price speculation.
2) 28 percent are having some difficulties of getting transportation.
3) 30 percent cannot dispose copra in a small lot, hence, will have to wait for a larger quantity to come in.
4) 20 percent have to redry the copra to keep it up to the market standard.

There are some damages in storing copra if it is not of the right quality. Damages done by rats and other bugs are quite substantial. Normally, copra is kept in sacks and piled up in the storage room. If the stock-time is long, it must be re-dried every now and then to prevent rottening. Therefore, copra is just like other products that needs a great care in storing to prevent the quality deterioration. Good copra commands good price but it is costly to produce and store. Not all traders in Thailand are particular in the quality hence, low price for Thai copra is evident.

2.6 Finance

In all businesses, adequate working capital is vitally important to their success. However, in coconut industry, the main producers, i.e. coconut growers are generally faced with financial problem. Their income is unbelievably low and heavily in debt at a very high rate of interest. Consequently, they cannot keep their product long enough to reap the benefit of high price in the off-season period. Worst of all, many of these farmers who are in debt are forced to sell their products to the creditors at a below-market price which further depresses their income.

In the period of high demand for coconut, heavy competition among traders can be beneficial to growers. Traders in this circumstance are willing to advance money to grower at a very cheap rate of interest or offer without interest at all in exchange with a forward contract to sell coconut to them at a specific price. This practice is mostly done in Chumpon and Samut-Songkram and Prachuap Kerikan where 68, 52 and 61 percent of traders, respectively, extend this kind of credit or loans to growers.

Formal lending by commercial banks and other financial institutions contribute only an insignificant portion of the total transactions. Most of the money to finance the growers' deficit come mainly from private money lenders or coconut traders in the same locality which works to the disadvantage of the growers. It is obvious that without adequate financing to coconut growers the chance to improve the productivity in this industry will be as slim as ever.

In January 1973, the Ministry of Agriculture in cooperation with the Ministry of Interior had set up a commission to investigate into the problem of coconut growers financial problem as to provide ways and means to establish the "Central Agricultural Products Market" with an aim to assist these growers in terms of finance as well as marketing at a just price. However, the evaluation of this process has not yet been made and the scope of operation is still small at present with only a limited amount of operational funds and staff. We therefore, do not expect any spectacular result from this commission in the near future.

An alternative to improve the productivity of this industry can also be done through investment in related industries. Thailand has a great potential in coconut industry but unfortunately, it lacks efficient support by products industries. Diversification of coconut products can still be made at a large scale but it costs a huge sum of money to accomplish. If the government can come up with a definite policy to promote these secondary industries, the chain effect will result in the over-all growth in the coconut industry.

To sum up, a careful plan of the government is the main factor to increase the productivity in coconut production. Promotion has to be done in both provision of adequate financing to the farmers and encouragement of investment in coconut related industries.

2.7 Risk and Information

There are many kinds of risk, coconut farmers are now confronted.

Uncertainty of weather conditions, price fluctuation and unstable market demand are few example of such a risk. Of all these, price fluctuation of coconut products seem to be most persistent and does a lot of damage to farmers. The existence of middlemen is said to be capable of releasing some of this risk from farmers somewhat but because these middlemen have to bear part of the burden of risk, they can only offer a consistently low price to the farrers which in this respect it does not help very much.

One way to reduce risk is to increase the knowledge of the current market situations. Perfect knowledge leads to preparation and production adjustments which can eliminate unnecessary or untimely expenses. Perfect information is vitally important to all trader and coconut is no exception. In practice, the only information the farmers get is from the middlemen which in fact comes faster than official news or other government sources. Due to this service, acceptances of the middlemen buying conditions are inevitable.

The best source of information in the distant region comes from the regional wholesalers who keep watching the market situation and price movement. About 91 percent of them listen to the commercial news and have connection with Bangkok Terminal markets. Contact is usually made through long distance telephone or personal travelling.

The pattern of information flow can be established as follows:

67 percent of local wholesalers receive information from Bangkok Terminal merket.

29 percent receive it from other local traders who are better informed.

2 percent receive it directly from coconut oil millers.

2 percent receive it from radio usually if it is related to copra price and then convert it to fresh nut price by a standard formula of 1 kg. of copra is equal to 4 medium size fresh nuts.

On the other side, oil millers have their own channel of obtaining market information.

About 48 percent of oil millers obtain this information directly from Bangkok copra Terminal market.

About 23 percent calculate the copra price from other industries which use coconut oil as their main input.

About 19 percent of them follow the international market price.

About 7 percent listen to the official domestic price.

And about 3 percent contact other source through writing and reads reports.

These information received have to be considered a raw data. Each of the trader has his own formula to translate them to practice. In places where competition among buyers is keen, price change in the same order throughout the region can be expected. But in the areas where only few traders are dominant, price changes can be substantial and frequent in the case of negative change but very slow or inert on the positive side. Therefore, we can conclude with confidence that price

fluctuation to the growers is rigid upward but sensitive downward. This kind of system is obviously harmful to the farmers whose bargaining power with these middlemen is practically zero. This disadvantage can be eradicated only when farmers are better informed and be more news conscious. However, this may be very difficult to establish since it involves a lot of restructuring especially the farmers' education. Hence, indirect method is needed badly now if the standard of living of these farmers are to be improved. The method of which the government's Central Market for Agricultural Products is heading for may be the best solution to this problem of ignorance.

Chapter III

PRICE ANALYSIS

3.1 Structure and Factors Affecting Prices of Coconut, Copra and and Coconut Oil

3.1.1 Fresh coconut price is determined by the interaction of market demand and supply. Its supply is constrained by the planting area and the yield per tree of coconut. On the demand side which can be viewed as having more influence on the price determinating process, can be examined according to its purposes.

a. Demand for domestic household consumption

b. Demand for export

c. Demand for industrial uses

These demands do not always fluctuate in the same direction, at the same time nor with the same magnitude. For example, the demand for fresh nuts for domestic household consumption is quite stable through time, subject to only minor variation in the public preference. Retail price of coconut can also affect the pattern of consumption. Therefore, instead of being the price determinator, the quantity of coconut for this purpose is very well the price reflector. Coconut demands for export and industrial uses are in fact the major price setter and tend to fluctuate quite often and within a wide range. For example,

the export demand is rather exogenous and unpredictable depending on many other factors. The industrial demand is a derived demand which also depends on numerous other occurences such as the change in public tastes, price of the competing products, government regulations, changes in tax structures, etc.

However, when we combine all types of coconut demand together we can easily see that the aggregate demand is quite unstable and its movement is rather short-live. Hence, one does not really expect the high coconut tree requires 5-7 years before it can bear the first nut. Hence, such a long time lag in supply does not make the production susceptible to a temporary changes in its price.

3.1.2 For copra, high price means either high demand or supply shortage. Among the two factors, the supply side appears to play an upper hand. For the simple reason that copra production is not an end in itself but rather a by-product of fresh nut marketing. Farmers usually get higher income selling fresh nuts more than turning them to copra first. Only small or broken nut which cannot command good market price, will then be processed as copra. Therefore, the quantity of copra supply each year depends on:

a. the situation in the fresh nut market
b. stock from last year
c. amount of import, and
d. domestic price of copra

Among these factors, the situation in the fresh nut market and import demand are the most influencial on the copra price. High fresh nut price always spells high copra price. High import demand on the other hand, reflects high domestic copra price which may be translated as the existence of an excess demand in the domestic market. Therefore, import tends to moderate the otherwise excessive changes in copra price.

Even though the demand element does not play a major role, its sudden change can also affect the price structure as well. If for example, a rise in copra demand from the coconut oil industry, which is practically the sole user of copra in Thailand will naturally push up the price of copra.

3.1.3 As for the coconut oil price, a few determinating factors can be examined.

1. the price of copra
2. the domestic demand for coconut oil which in turn depends on :
   a. the demand from manufacturers using coconut oil as a raw material such as concentrated milk industry and margarine industry.
   b. the household demand for cooking oil.
   c. aggregate previous year stock of coconut oil
3. the relative price of coconut oil in the international market.

It can be easily seen that the supply influence exerts itself in to the process of price determination through the copra market situation. This supply factor is not considered as important as the demand factors.

3.1.4 To be a little specific some regression analysis on the inter-relationship among the three products, i.e., fresh nut, copra and coconut oil are here presented.

The data for the computation is obtained from the Agricultural Economic Department for the years 1964-1973.

$$(1) \quad \Delta Y_1 + 1.8217 + \underset{(0.32711)}{1.44001} \ (\Delta X_1)$$

$$R = 0.67128$$

$$(2) \quad \Delta Y_2 = 4.02347 + \underset{(0.28227)}{0.91659} \ (\Delta X_2)$$

$$R = 0.51387$$

where: Y_1 = copra price

X_1 = fresh nut price

X_2 = coconut oil price

X_2 = copra price

Although the coefficient of determinating R-value of both equations are not spectacularly high, they are extremely good when price variations are used instead of absolute values. Other statistical properties seem quite acceptable, hence we can conclude that their relationships are closed and quite stable.

3.2 Seasonal Fluctuation

Coconut tree bears fruit in every 45 days all year round. However, the most productive period for coconut in Thailand is during the month of April-May. During this period until September, the coconut price tends to be relatively low due to the in-season supply. After September, its price starts climbing up and reaches the peak in November. Then it dips down a little since around December and January some types of coconut especially from Bang-Chang or Samutsakorn start yielding more nuts again.

On the demand side, a seasonal pattern is clear. Chinese new year in February, Thai new year in April and some major Buddhist festivals in July and October periods of high demands for coconut which together form a regular pattern. During these periods, coconut price will be normally pushed up high unless they are offset by an extraordinary large supply.

The seasonal price fluctuation as a result of the interaction of both seasonal demand and supply is shown in Table 3.1.

Table 3.1

WHOLESALE PRICE OF COCONUT (SAMUI) IN BANGKOK 1963-1973

Year	Average Price	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1963	1.26	0.95	1.09	1.17	1.29	1.20	1.02	1.16	1.30	1.34	1.55	1.52	1.54
1964	1.70	1.34	1.90	1.34	1.60	1.72	1.64	1.55	1.48	1.58	1.96	2.20	2.05
1965	1.36	1.84	1.85	1.58	1.48	1.25	1.25	1.26	1.15	1.13	1.13	1.10	1.08
1966	1.13	1.08	1.08	1.03	1.07	1.07	1.02	0.95	0.91	0.92	1.30	1.49	1.68
1967	1.69	1.75	1.88	1.89	2.05	1.84	1.48	1.47	1.54	1.48	1.67	1.61	1.64
1968	1.23	1.39	1.26	1.41	1.21	1.18	1.13	1.23	1.21	1.14	1.16	1.11	1.29
1969	1.52	1.24	1.30	1.58	1.55	1.54	1.41	1.29	1.33	1.46	1.58	1.88	2.13
1970	1.69	2.30	2.45	2.15	2.06	1.93	1.55	1.42	1.28	1.25	1.18	1.25	1.46
1971	1.21	1.28	1.21	1.32	1.38	1.20	1.12	1.15	1.13	1.26	1.25	1.20	1.00
1972	1.38	1.00	1.13	1.24	1.25	1.20	1.08	1.25	1.14	1.25	1.51	2.24	2.25
1973	2.84	2.30	2.44	2.50	2.30	2.06	2.06	2.08	2.18	2.44	3.25	3.32	4.53
Price Index	100.00	96.55	103.11	100.09	101.52	94.93	86.63	87.21	87.06	94.03	104.39	123.24	120.16

Source: Division of Agricultural Economics

3.3 Price Trend

3.3.1 The examination of the wholesale price trend of fresh coconuts reveals that on the long run, it slowly shifts upward at the average rate of only 1.28 percent per annum. Comparing this figure with other cost of production, i.e., labor cost, food price, land price and tool and equipment prices, the coconut farmers are actually operating at an ever decreasing real income. For example, take the fertilizer price which increases at an average rate of 12.79 percent* per annum and the general consumer price index which increases about 8.8 percent a year on average the farmers are on the losing side all the way and in all aspects.

As mentioned earlier in the previous chapter, this disparity between cost and revenue to the farmers arises mainly out of the unmatched bargaining power of the farmers themselves. The entire market is controlled by buyers henceforth pushing the farmers in to the price taker corner throughout the entire history. As a price taker, the only avenue left to the farmers to increase their gross earnings is to increase their productivity. However, if they do it too excessively and too quickly over and above, the aggregate demand can absorb, the increased supply will most likely depress the coconut price still further. Indeed, the farmers are really in an awkward position having to sit on the fence all along.

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* See Table 1.18.

3.3.2 A shorter run examination shows that there exists a kind of cyclical movement in the coconut price such that it has a peak and a trough roughly every four years. As evidence, it reached the peak in 1964, 1967, 1970 and again in 1973. If this casual observation is correct, the coconut price will probably hit its peak again in 1976.

This cyclical pattern is shown in figure 3.1.

3.3.3 As for copra price trend, it follows the supply pattern (supply plays a dominant role in copra price determination). After May, the price of copra tends to be rising since it is the beginning of copra production season when fresh nut harvesting reaches its peak and farmers start to switch to copra production as the price of fresh nuts declines. As there is a considerable time lag in copra production, its price remains at high level until July when the peak is reached and starts to shift downward thereafter. It moves up again, however, in November because of the end season for copra and the fresh coconut starts to gain higher price.

Long run observation shows that the copra price is quite inactive with a slight upward shift of only 0.62 per cent a year on average. This upward trend is much less than that of the fresh nuts reconfirming, therefore, the belief that copra production is only for a residual income while the main income is derived from selling of fresh nuts.

3.3.4 As for the coconut oil price, it has a close relationship with the copra price and the prevailing market demand. Therefore, a cyclical pattern can be spotted. It starts to rise in June because

Figure 3.1

Wholesale Price Index of Coconut, Copra and Coconut Oil in Bangkok 1963 - 1973

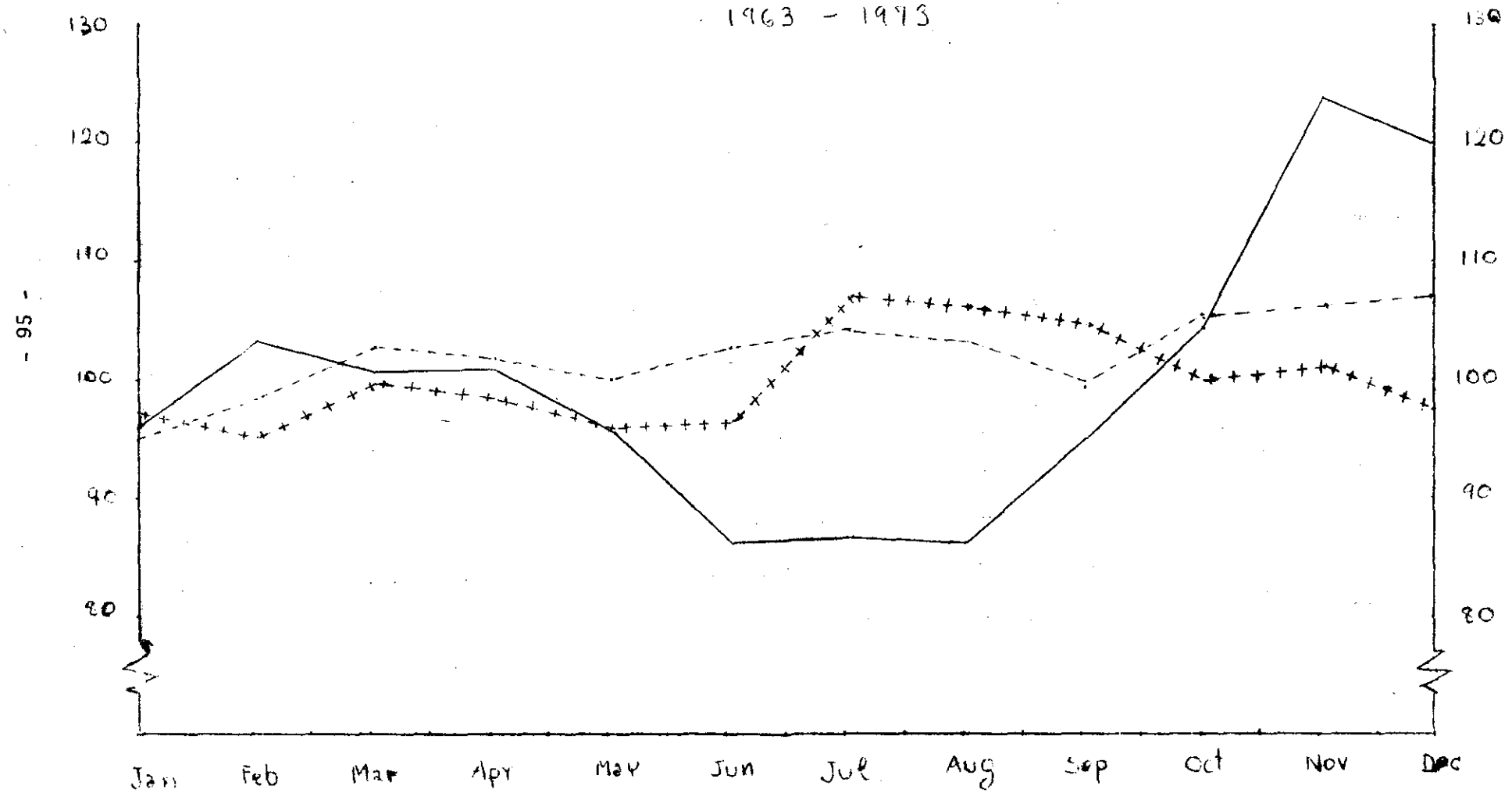

Table 3.2

WHOLESALE PRICE & PRICE INDEX OF COPRA IN BANGKOK 1963-1973

฿/kg.

Year	Average Price	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1963	3.52	2.85	3.10	3.40	3.42	3.15	3.10	3.35	3.79	3.75	3.90	4.08	4.33
1964	4.51	4.33	4.33	4.71	5.08	4.35	4.25	3.83	4.22	4.70	4.75	4.77	4.83
1965	4.84	5.25	4.49*	5.04	4.21	3.50	3.38	3.07	7.83	6.73	3.27	2.90	3.08
1966	3.00	3.04	2.99	2.83	2.81	2.69	2.76	2.72	2.63	2.78	3.46	3.68	3.67
1967	4.15	3.66	3.66	3.66	3.81	4.08	4.49	4.38	4.42	4.42	4.42	4.41	4.42
1968	3.73	4.02	3.67	4.08	4.02	3.94	3.75	3.33	3.40	3.19	3.10	3.58	4.14
1969	4.10	4.17	4.17	4.17	4.17	4.17	3.92	4.07	4.08	4.08	4.08	4.08	4.08
1970	4.04	4.07	4.08	4.08	4.08	4.08	4.08	4.08	3.62	3.81	3.98	4.27	4.30
1971	3.40	4.08	4.08	3.98	3.92	3.92	3.90	3.14	3.08	2.92	2.89	2.44	2.50
1972	3.20	2.83	3.22	3.23	3.08	3.08	3.12	3.25	3.23	3.00	3.21	3.43	3.79
1973	5.84	4.58	4.58	4.62	4.65	5.10	5.75	6.67	6.67	6.67	7.25	7.72	8.15
Price Index	100	97.26	94.51	99.25	98.25	95.26	96.26	107.48	106.48	104.49	100.51	102.74	97.51

* Estimated from following equation: $Y = 1.82117 \times 1.440$ where x = copra price, y = fresh nut price

Source: Division of Agricultural Economics.

the raw materials' price, i.e., copra's price is high. It reaches the peak in July due to seasonably high demand during the Chinese festival during which the consumption of animal products especially lard is abstained and hence they switch to vegetable oil. After that, the coconut oil price normally turns down but will rise again after September because of some religious festivals. Until after February up to June, is the oil price dominated by copra prices. (Figures 3.3 to 3.4)

A long run trend of the coconut oil price can be best examined according to its types, i.e., crude oil and refined oil. The former type which is suitable for industrial uses such as soap reveals a clear rising trend of about 1.90 percent a year during 1963 to 1973. However, it should be noted that the degree of price increase concentrate vary heavily toward the end of the period, i.e., after 1971. The main reason for this sharp upturn is the general inflation which has depressed the purchasing power of the national currency down quite drastically. Prior to this phenomenon, the crude coconut oil price showed a reasonable stable trend.

A similar reason can also be given to the refined coconut oil price, as the rising trend is evident at 1.43 percent per year on average which is somewhat less than that of crude oil. The refined coconut oil is suitable for household consumption and certain industrial uses such as sweetened milk. As for cooking purpose, coconut oil is facing with a stiff competition from other similar products both other types of vegetable oil extracted from variety of seeds and also from animal fat. Moreover, in the past, the refining process of coconut oil has not been

Figure 3.2

Wholesale Price of Coconut in Bangkok

1963 - 1973

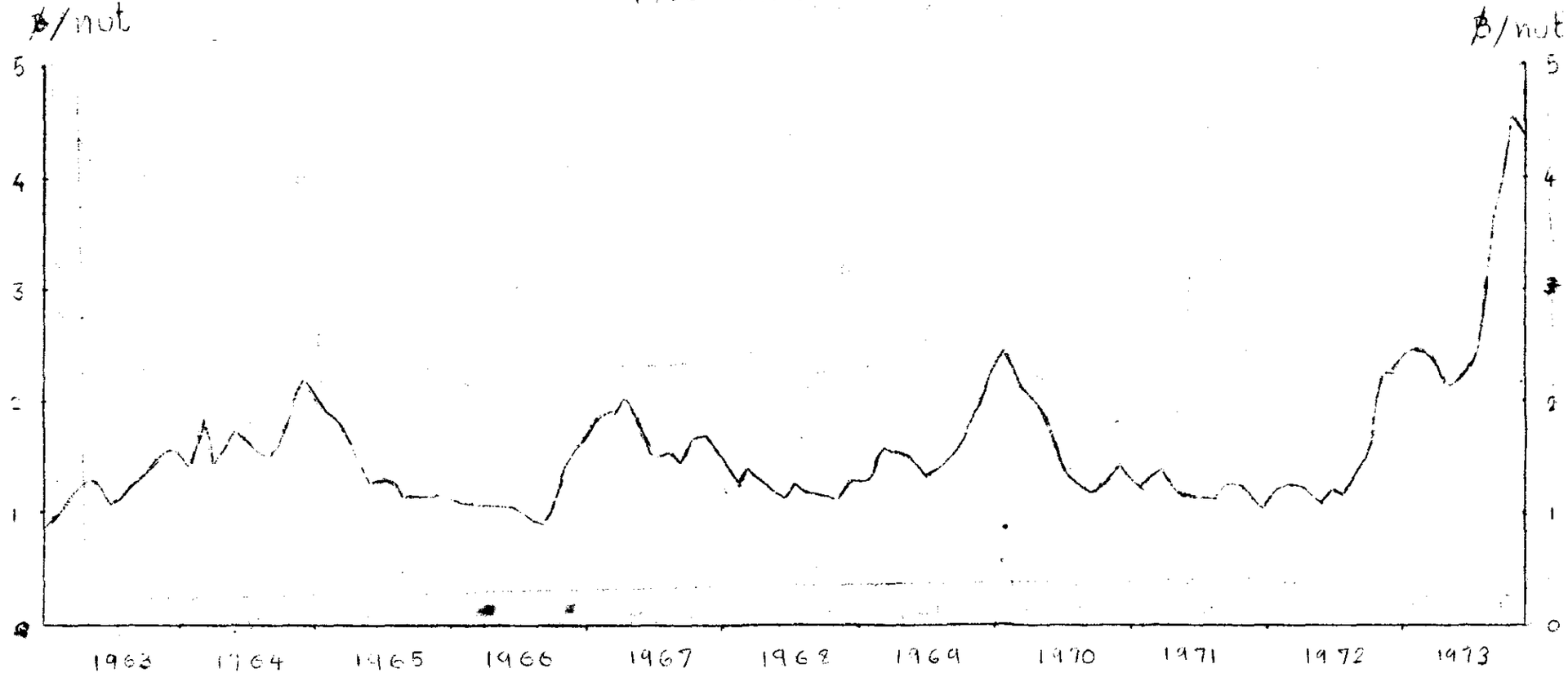

Figure 3.3

Wholesale Price of Copra in Bangkok

1963 - 1973

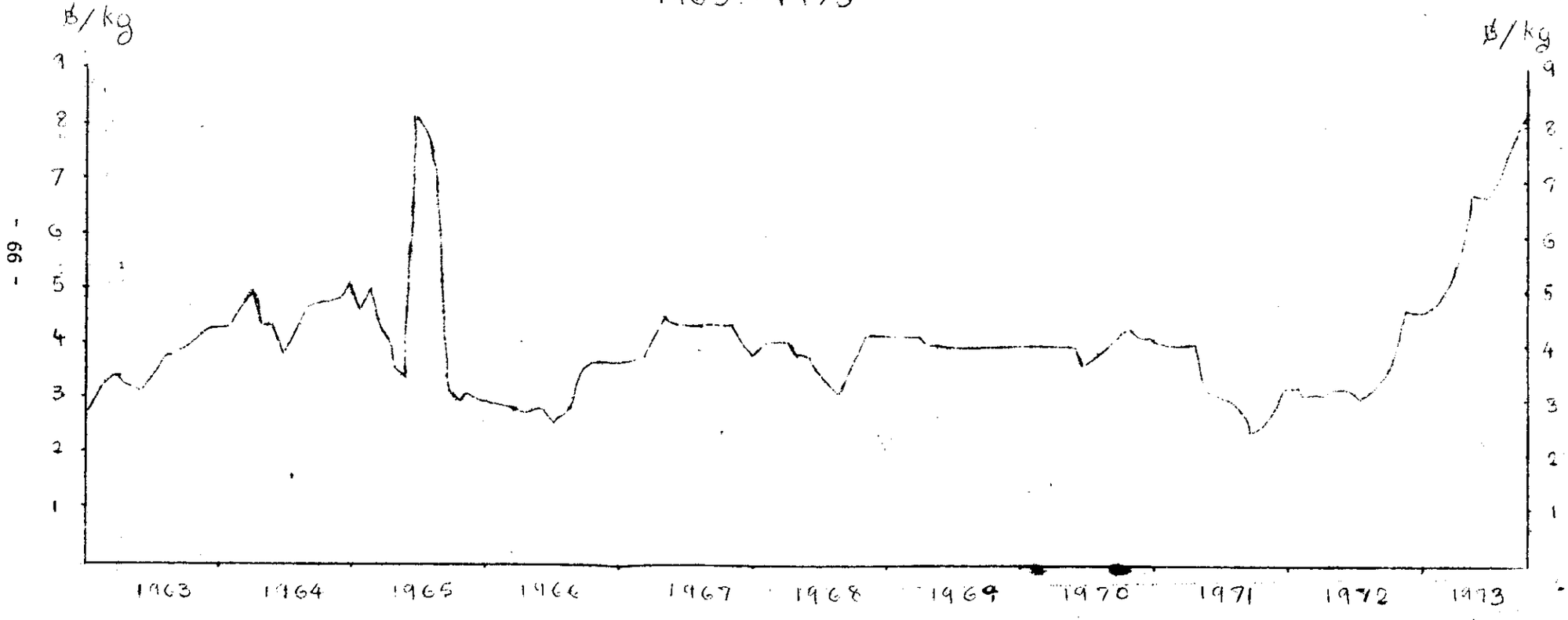

Figure 3.4

Wholesale Price of Coconut Oil in Bangkok

1963 - 1973

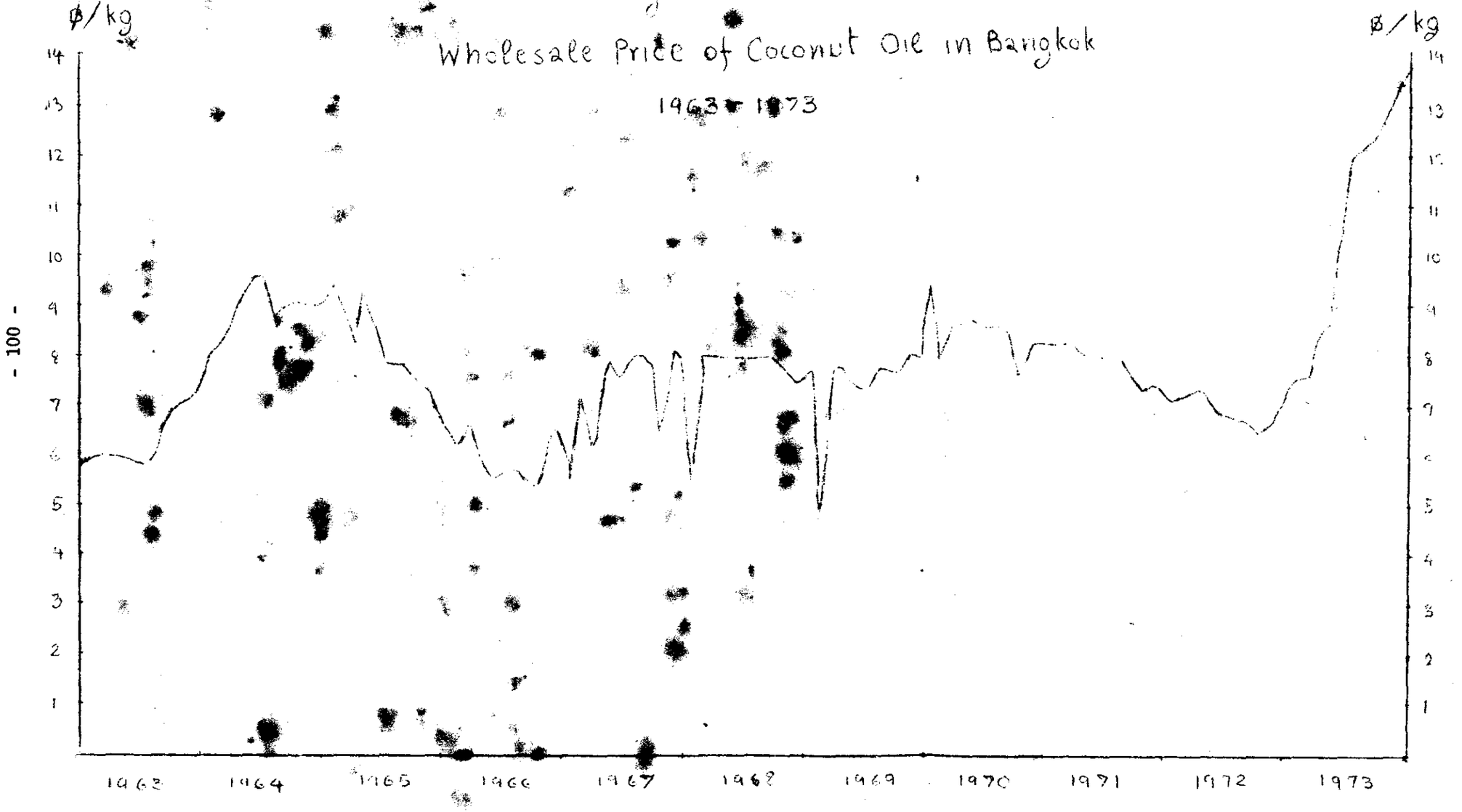

Table 3.3

WHOLESALE PRICE OF COCONUT OIL IN BANGKOK 1963-1973

Year	Average Price	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1963	6.58	5.94	5.88	6.00	5.97	5.79	5.93	6.67	7.14	6.98	7.16	7.69	8.17
1964	9.03	8.20	8.61	9.19	9.57	9.52	8.69	8.82	9.08	9.08	9.00	9.02	9.57
1965	7.57	8.83	8.13	9.29	8.50	7.80	7.80	7.80	7.42	7.42	7.17	6.43	6.42
1966	5.77	6.00	6.76	5.80	5.54	5.54	5.75	5.64	5.42	5.42	6.38	6.30	5.42
1967	7.29	7.42	5.93	7.50	8.04	7.39	7.89	8.00	7.92	6.25	8.13	8.07	5.25
1968	7.83	8.17	8.00	8.00	8.00	8.00	8.00	8.00	8.00	7.75	7.52	7.42	7.75
1969	7.60	4.65	7.75	7.67	7.50	7.33	6.33	7.75	7.75	7.69	8.00	8.00	9.62
1970	8.51	7.75	8.67	8.67	8.67	8.58	8.58	8.58	8.48	7.52	8.33	8.33	8 33
1971	7.79	8.33	8.33	8.20	8.00	8.00	8.00	8.00	7.59	7.37	7.37	7.31	7.12
1972	6.92	7.12	7.21	7.40	7.08	6.78	6.77	6.70	6.54	6.46	6.64	6.83	7.41
1973	9.29	7.58	7.58	8.50	8.64	9.60	11.47	12.00	12.20	12.30	12.90	13.40	13.83
Price Index	100.00	95.02	98.42	102.42	101.58	100.18	102.41	104.50	103.99	99.83	105.25	105.49	105.60

Source: Division of Agricultural Economics.

sophisticated enough to command popularity from housewives. It contains high degree of lauric acid about 40-50 percent causing too much bubbles and no deodorization process was good enough to get rid of its strong natural but unpleasant smell.

However, the future of both types of the coconut oil is not that dim. The expansion of industrial activities and the rising market demand will likely push the crude oil price up still further. As for the refine oil, new process has been found and a super grade refine coconut oil for cooking purpose has been successfully commercialized at a competitive price[1/] which means more demand for coconut is assured.

3.4 Structure of Price Differential

3.4.1 Coconut prices are differentiated not only by size or type but also by their origins. As it is evident, coconut from Tub-sa-kae (Prachuab Kirikan) and from Bang-Chang (Samut Sakorn) are normally more expensive than those from other places. Partly it is because of the belief of the superior quality of the coconut and partly due simply to the traditional high price and marketing technique of the traders in-charge. Table 3.4 to 3.7 summarize these locational price differential at four different markets.

1/ Lever Brothers (Thailand) is creditably the pioneer in this aspect.

Table 3.4

AVERAGE COCONUT BUYING PRICE OF TRADERS IN LOCAL GROWER'S MARKET OR FARMER'S SELLING PRICE CLASSIFIED BY PROVINCES

Unit: Baht/Nut

Provinces	1972							1973				
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Rajburi	0.77	0.79	0.83	0.87	1.20	1.49	1.87	2.04	2.11	1.74	1.90	1.22
Cholburi	0.70	0.71	0.81	1.16	1.26	1.37	1.43	1.56	1.58	1.49	1.29	1.07
Puket	0.70	0.80	0.80	1.10	1.20	1.20	1.50	1.50	1.40	1.30	1.20	-
Chumpon	0.80	0.89	0.96	1.02	1.15	1.26	1.47	1.59	1.66	1.60	1.36	1.20
Prachuab	0.79	0.83	0.93	1.11	1.29	1.63	1.90	2.16	2.04	1.99	1.80	1.72
Narativas	0.84	0.93	1.03	1.03	1.04	1.05	1.06	0.90	0.98	0.97	1.04	-
Surat-Tani	0.73	0.75	0.85	0.88	0.90	1.01	1.11	1.23	1.37	1.43	1.21	-
Songkla	1.06	1.06	1.07	1.10	1.50	2.00	2.00	2.00	2.00	2.00	1.70	-
Pangna	1.10	1.10	1.10	1.10	1.10	1.20	1.20	1.30	1.30	1.50	1.36	-
Pattani	1.00	1.00	1.00	1.10	1.20	1.60	1.60	1.50	1.50	1.50	1.50	-
Samutsongkam	0.58	0.68	0.73	0.84	1.10	1.30	1.88	1.86	1.95	1.83	1.68	1.33
Average Price	0.85	0.88	0.92	1.02	1.16	1.34	1.50	1.58	1.59	1.55	1.44	1.38

Table 3.5

AVERAGE COCONUT SELLING PRICE OF TRADERS IN LOCAL GROWER'S MARKET CLASSIFIED BY PROVINCES

Baht per nut

Provinces	1972							1973				
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Rajburi	0.99	1.01	1.14	1.31	1.57	1.78	1.97	2.12	2.19	2.20	1.92	1.46
Puket	0.92	0.96	1.01	1.19	1.28	1.40	1.52	1.55	1.42	1.35	1.27	-
Chonburi	0.94	0.93	1.00	1.22	1.47	1.59	1.82	1.89	1.98	1.63	1.62	1.24
Chumpon	0.94	0.99	1.10	1.17	1.33	1.47	2.03	1.68	1.74	1.64	1.47	1.36
Prachaub	0.95	0.99	1.10	1.28	1.49	1.79	2.01	2.16	2.16	2.10	1.90	1.78
Narativas	1.04	1.13	1.23	1.26	1.27	1.29	1.31	1.13	1.19	1.18	1.26	2.20
Surat-tani	0.87	0.92	0.97	1.10	1.08	1.22	1.36	1.37	1.46	1.44	1.26	-
Songkla	1.60	1.80	2.00	2.00	2.00	2.20	2.20	2.00	2.20	2.20	2.00	-
Pangna	1.30	1.30	1.40	1.40	1.50	1.50	1.50	1.50	1.75	1.74	1.75	-
Pattani	1.30	1.30	1.40	1.70	1.70	2.00	2.00	1.70	1.70	1.70	1.80	-
Samutsongkam	0.70	0.75	0.83	0.94	1.12	1.42	1.76	2.02	2.10	1.87	1.68	1.21
Average	1.05	1.10	1.20	1.32	1.44	1.60	1.77	1.74	1.81	1.73	1.60	1.54

Table 3.6

COCONUT SELLING PRICE OF TRADERS IN ASSEMBLY WHOLESALE MARKET
CLASSIFIED BY PROVINCES

Provinces	1972							1973				
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Prachaub Kirikan	1.25	1.25	1.30	1.35	1.55	1.90	2.05	2.20	2.40	2.30	2.10	1.90
Surat-tani	1.25	1.25	1.30	1.30	1.50	1.60	1.60	1.70	1.80	2.00	1.90	1.80
Rajburi	1.25	1.25	1.45	1.60	1.70	1.95	2.05	2.30	2.40	2.65	2.20	1.80
Puket	1.25	1.25	1.30	1.30	1.50	1.60	1.60	1.75	1.90	1.90	1.70	1.60
Cholburi	1.25	1.25	1.30	1.50	1.60	1.70	2.00	2.10	2.10	2.00	2.00	1.80
Chumpon	1.25	1.25	1.30	1.30	1.50	1.60	1.70	1.80	1.85	1.90	1.90	1.80
Samutsongkam	1.25	1.25	1.30	1.30	1.50	1.70	1.90	2.30	2.50	2.05	2.00	1.90
Average	1.25	1.25	1.30	1.35	1.54	1.83	1.98	2.14	2.39	2.21	2.06	1.88

Table 3.7

COCONUT RETAIL PRICE IN LOCAL GROWER'S MARKET AND ASSEMBLY WHOLESALE MARKET CLASSIFIED BY PROVINCES

Baht per nut

Provinces	1972							1973				
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Narativas	2.00	2.00	2.00	2.00	2.00	1.96	2.00	2.91	2.96	2.91	2.41	-
Nakornsi-tham-rat	0.93	0.43	1.01	1.10	1.30	1.34	1.54	1.39	1.28	1.23	1.23	-
Surat-tani	1.06	1.06	1.10	1.17	1.30	1.53	1.58	1.80	1.80	1.80	1.80	-
Songkla	1.40	1.40	1.60	2.20	2.20	2.40	2.40	2.40	2.40	2.40	2.20	-
Pangna	1.30	1.30	1.40	1.47	1,58	1.74	1.74	1.74	1.74	1.74	1.67	2.00
Pattani	1.22	1.25	1.35	1.40	1.60	1.62	1.60	1.66	1.66	1.66	1.40	-
Puket	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Nakorn-pathom	1.70	1.70	1.82	2.35	2.45	2.57	2.67	2.35	2.22	2.22	2.12	2.00
Cholburi	0.92	0.92	1.04	1.04	1.04	1.20	1.25	1.40	1.26	1.30	1.30	1.32
Greater Bangkok	2.50	2.50	2.50	2.50	2.50	2.50	2.50	3.00	3.00	3.00	3.00	3.00
Average	1.49	1.47	1.53	1.58	1.69	1.81	1.92	2.11	2.10	2.14	1.97	2.12

It should be noted that the price differential between what the farmers get and the final wholesale price is quite a gap. It ranges from ฿1.65 (2.50-0.85) in June to ฿1.91 (3.00-1.59) in February.

Whether the coconut farmers are overly exploited by these middlemen can be examined by the distributive share of the coconut price at the final retail market as follows:

For every one baht, the distributions are:

1.	Farmers	66.67%
2.	Transportation cost	8.34
3.	Labor cost	6.78
4.	Managing cost	6.64
5.	Container cost	0.94
6.	Tax	0.84
7.	Interest	0.39
8.	Others	0.06
9.	Profit to local traders	3.32
10.	Profit to assembly wholesaler	3.12
11.	Retail trader margin	2.86
	Total	100.00%

It is now clear that the total net profit accrued to the traders of all levels is only 9.30 percent of the retail price where the largest share goes to the farmers at 66.67 percent or 2/3 of the retail price of coconut.

Such an evidence indicates one important fact that coconut trading is not that lucrative but full of keen competition. To help the farmers to get more share may be possible by eradication of the middlemen cost which stands at 9.30 percent out completely by forming the growers cooperative to take care of the marketing activity. However, it is not altogether certain that much could be gained by so doing for while we can save the middleman's share, other costs may very well increase. It is the fact that expertise in management and marketing means efficiency and least cost of operation. Each level of activity does need a specialized knowledge to handle things properly and in the cheapest way. And since we have already found in the previous chapter that the role of the middleman is still important in the coconut industry, it may not pay to try to get rid of these traders. The only possible means open to the government is to increase the productivity of the coconut farming and to promote industries that use coconut by-products as their raw material.

Another item that weigh quite heavily in the marketing process is transportation cost which takes 8.34 percent out of the circle. This cost will in the future be lowered only the communication infrastructure network is improved. It has a tendency to be so according to the National Economic and Social Plan which emphasizes the overall land transportation of the Southern region of Thailand and as a matter of fact many new highways are now under construction.[1/]

1/ See Southern Development Plan 1977-1981, Centre of Southern Development NESDB.

3.4.2 For copra, locational price differentials also exist for example copra from Pattani especially from Saiburi district simply because of its superior quality which is capable of yielding more oil. The price structure of copra from different location is given in tables 3.8 to 3.10.

It should be noted that the price differential between farmer selling price (Table 3.8) and trader selling price (Table 3.10) is ranged from ฿0.63 (3.19-2.56) in June to ฿/kg. to 1.24 (4.70-3.46) in April. Such differentiation is not great as much as fresh nut price (i.e. it ranges ฿/nut 1.65-1.91).

The evidence indicated that copra making for commercial purposes is unpopular in Thailand usually using under average and broken nuts as an input in which causes the output price to be low. However, coconut oil price at mill are nearly the same (Table 3.11).

The examination of income distribution among all parties involved reveals a similar pattern of that of fresh nut market.

The distributive shares in the copra trade including oil extraction are shown as follows:

1.	Farmers	62.53%
2.	Transportation	3.46
3.	Labor	3.37
4.	Management	3.10

5.	Commission	1.22%
6.	Tax	0.80
7.	Other, e.g., packaging, interest, etc.	3.62
8.	Local traders' profit	5.16
9.	Wholesale profit	10.28
10.	Oil miller's profit	6.53
	Total	100.00%

To make the picture more complete, an example of the average prices at each level of activity can be of some help.

Of 1,000 kg. of copra, a cross-sectional shares are:

		Amount	Cumulative Percentage
1.	Farmer's price	฿ 2,800.00	62.53%
2.	Local trader's price	3,190.00	71.24
3.	Wholesale price	3,860.00	86.20
4.	Oil mill price plus oil cake	4,478.16	100.00%

Table 3.8

COPRA BUYING PRICE OF TRADERS IN LOCAL GROWER MARKETS
CLASSIFIED BY PROVINCES

Baht/kg.

Provinces	1972							1973				
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Chumpon	2.17	2.11	2.55	2.70	2.71	2.80	2.98	2.90	3.18	2.92	2.65	3.46
Pattani	2.80	2.55	2.90	3.10	3.20	-	-	-	3.51	3.50	4.00	-
Narativas	2.70	2.80	2.80	2.45	2.70	2.70	2.70	2.70	2.70	3.00	3.73	-
Average	2.56	2.49	2.75	2.78	2.87	2.75	2.84	2.80	3.13	3.14	3.46	3.46

Table 3.9

COPRA SELLING PRICE OF TRADERS IN LOCAL GROWER MARKET
CLASSIFIED BY PROVINCES

Provinces	1972							1973				
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Chumpon	3.00	3.00	3.00	3.00	3.00	3.00	3.00	-	-	-	-	-
Pattani	3.25	3.25	3.25	3.25	3.25	-	-	-	3.30	3.50	3.50	-
Narativas	2.90	2.95	2.95	2.80	3.00	3.05	-	-	-	-	-	-
Average	3.05	3.07	3.07	3.02	3.08	3.03	3.30	-	3.30	3.50	3.50	-

Table 3.10

COPRA SELLING PRICE OF TRADERS IN ASSEMBLY WHOLESALE MARKET
CLASSIFIED BY PROVINCES

Baht/kg.

Provinces	1972							1973				
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Surat-tani	3,18	3.18	3.31	3.32	3.78	3.80	3.75	-	-	-	-	-
Nakorn-srithamrat	3.10	3.12	3.30	3.30	3.38	3.47	-	-	-	-	-	-
Pattani	3.30	3.20	3.40	3.50	3.80	-	-	-	-	-	-	-
Chumpon	3.18	3.18	3.23	3.28	3.69	3.74	3.81	4.05	4.32	4.51	4.70	4.60
Average	3.19	3.17	3.31	3.35	3.66	3.67	3.78	4.05	5.32	4.51	4.70	4.60

Table 3.11

COCONUT OIL PRICE AT OIL MILLS

Baht/kg.

Provinces	1972							1973				
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Narativas	6.08	6.08	6.08	6.68	6.68	6.59	6.80	7.35	7.41	7.73	7.61	-
Nakorn-srithamrat	6.64	6.64	6.64	6.64	6.87	6.89	7.65	8.20	8.20	8.59	-	-
Pattani	6.08	6.25	6.60	6.60	6.78	6.78	6.81	7.82	7.82	7.82	8.28	8.28
Surat-tani	6.65	6.74	6.77	6.77	6.88	7.02	7.15	7.27	7.15	7.43	7.32	7.32
Trang	6.00	6.00	5.33	6.00	6.33	6.66	6.66	7.00	7.00	7.33	7.30	-
Songkla	5.38	5.38	5.38	6.54	6.54	6.54	6.54	7.31	7.31	7.31	7.31	7.31
Yala	5.80	5.70	5.70	5.70	5.80	5.80	5.90	5.90	6.00	6.00	6.00	-
Puket	6.05	6.35	7.00	7.00	6.95	7.[illegible]	7.20	7.15	7.10	7.40	7.92	-
Bangkok	6.58	6.58	6.58	6.58	6.58	6.58	6.67	6.83	7.00	10.83	10.83	10.83
Average	6.14	6.19	6.34	6.50	6.60	6.70	6.82	7.20	7.22	7.83	7.82	8.44

Chapter IV

REHABILITATION ANALYSIS

4.1. Back Ground

The largest coconut production area at the present stage is concentrated in the South of Thailand. Due to the dominance of very old trees, there is now an urgent need for replanting. The government itself has recognized this need and has included this program in the 1972-1976. Five Year National Economic and Social Development Plan. The program launched in a defined area is to be 2 pilot project to serve as a model for the whole kingdom at a later stage. For this purpose Koh Samui Island has been chosen, as the region is almost solely devoted to coconut plantation.

While the need for replanting is well recognized by the government, the program has not started yet due to shortage of funds. The cabinet approved in this replanting program on January 1976 but the details of the budget have not yet been worked in principle out. Funds are expected to come from the "Farmer Aids Funds' derived from rice premiums. The Ministry of Agriculture has set up the Committee for Coconut Replanting Project and has assigned the Director General of Agriculture Extension Department as the chairman of the Committee. Its members consist of officials from Agriculture Extension Department, Agriculture Department and Rubber Planting Aids Funds Bureau. These three authorities are to undertake the following tasks:-

1. Coconut planting promotion, this is the responsibility of the Department of Agricultural Extension.

2. Rehabilitation of the plantation-planting of new trees and make an improvement on the existing ones. The tasks is the responsibility of the Agriculture Department.

3. Replanting project - Rubber Replanting Aids Funds Bureau is assigned to this task.

The latter two assignments are to serve as pilot projects. The rehabilitation project was initially expected to cover an area of 6,609 Rai on Koh Samui Island. However, the Ministry of Agriculture decided to give up the project at the last minute. The remainder is the replanting project which is expected to cover an area of 500 Rai on Koh Samui Island. The project is conducted by Rubber Planting Aids Funds Bureau for the reason that they have had long experience in rubber replanting and law enforcement. However, the tasks still require cooperation of other agencies namely the Agriculture Extension Department and the Agriculture Department.

The Agriculture Extension Department takes the reponsibility for supplying seedlings. It is expected that 100,000 seedlings will be needed in the initial period. Cost of seedling is expected to be 4 Baht each and on this must be added other extra expenses, i.e., transportation, breeding and nursary expenses amounting to about .75 Baht per seedling.

The Agriculture Department takes responsibility only for hybrid breeding.

The Rubber Planting Aid Funds Bureau is the executor of this project, taking responsibility for studying the cost of replanting and extending funds to the farmers. The Bureau has proposed a five year plan (1976-1980) to conduct the project, the duration of which is adequate for cultivation up to nut bearing of the tree.

4.2. The Objective of the Project

1. To find cost data for replanting per rai to be used for planning of coconut development areas in the near future.

2. To find the data for replanting operation and learn its cultivation practices.

3. To serve as demonstration plots for replanting as well as a training center of technically-qualified agricultural extension workers.

To achieve the objective, operation is a limited to manageable size. The project, therefore, will cover only 500 Rai. At present, there are 262 farmers who have applied for participation in this project and altogether the replanting plots cover an area of 636 Rai.

4.3. Operational Method

According to the scheme the operation will follows the steps mentioned below:

1. Survey and persuade farmers who are willing to participate in the replanting project.

2. Survey and analysis, and carry out land subdivision, (land use planning)

3. Recruitment of staff, and procurement of supplies, equipment and inputs to carry out project as scheduled.

4. Coordination with other relevant agencies.

4.4. The Budget

This project will have the duration of 5 years (1976-1980); the budget is expected to be allocated from the Farmer's Aid Funds and to be appropriated as follows:

Baht

Budget Year	Administrative Expenses	Replanting Aids Funds for Recurrent Cost	Replanting Aid Funds, Capital Budget	Total Budget
1976	106,527	80,000	672,500	859,027
1977	95,740	50,000	160,000	305,740
1978	102,753	50,000	200,000	352,753
1979	106,725	50,000	240,000	396,725
1980	111,284	50,000	280,000	441,284
Total	523,029	280,000	1,552,500	2,355,529

Details of Budget Administrative Expenses

Statement No. I

Expense	Budget Year					Total 5 year	Note
	1976	1977	1978	1979	1980		
Salary							
Salary	22,200	24,000	27,600	29,400	31,200	134,400	
Temporary Employment							
Temporary Wage	2,000	-	-	-	-	2,000	
Remuneration of Staff							
Rent allowance	4,752	5,280	6,072	6,468	6,864	29,436	
Children's Education	1,800	1,800	1,800	1,800	1,800	9,000	
Children's Aids Funds	1,800	1,800	1,800	1,800	1,800	9,000	
Expenses							
Communication	1,000	1,000	1,000	1,000	1,000	5,000	
Transport	18,600	18,600	18,600	18,600	18,600	93,000	
Per diem	10,000	10,000	10,000	10,000	10,000	50,000	
Accomodation	3,000	3,000	3,000	3,000	3,000	15,000	
Maintenances	1,000	1,000	1,000	1,000	1,000	5,000	
Miscellaneous	5,000	5,000	5,000	5,000	5,000	25,000	
Supplies							
Staticneries	5,000	6,000	7,200	8,640	10,368	37,208	(Increased 20% per annum)
Fixtures							
Office Supplies	12,750	-	-	-	-	12,750	
Central Budget							
Pension	1,850	2,150	2,900	2,900	3,200	13,000	
Income Tax paid on behalf of Employees	1,055	1,210	1,521	1,677	1,832	7,295	
Contribution to pension	2,220	2,400	2,760	2,940	3,120	13,440	
Medical allowances	2,500	2,500	2,500	2,500	2,500	12,500	
Reserve	10,000	10,000	10,000	10,000	10,000	50,000	
Total Annual Administrative Expenses	103,527	95,740	102,753	106,725	111,284	523,029	

Replanting Aids Funds: Recurrent Expenses

Statement No. II

Expenses	Budget year					Total 5 Year	Note
	1976	1977	1978	1979	1980		
Supplies							
- Insecticide & Herbicides	50,000	50,000	50,000	50,000	50,000	250,000	- (500 kg. x 100 %)
Fixtures							
- Purchase of Sprays (Manual)	30,000	-	-	-	-	30,000	- 50 Herbicide spray 25 Insecticide spray at 600 each
Total	80,000	50,000	50,000	50,000	50,000	280,000	

Replanting Aids Funds-Capital Budget

Statement No. III

		Budget year					Total	Note
		1976						
Lot I								
Cleaning & Shrubbing	350฿/Rai	175,000					175,000	Total 670 ฿/rai x 500 rai = 335,000 Baht
Ploughting	180฿/Rai	90,000					90,000	
Preparation	100฿/Rai	50,000					50,000	
Fertilizers	40฿/Rai	20,000					20,000	
Lot II								
Seedlings	110฿/Rai	55,000					55,000	Total 675 ฿/rai x 500 rai = 337,500 Baht
Planting	25฿/Rai	12,500					12,500	
Secondary plants	300฿/Rai	150,000					150,000	
Weeding	80฿/Rai	40,000					40,000	
Fertilizer	160฿/Rai	80,000					80,000	
Lot III								
Weeding	80฿/Rai		40,000				40,000	320 ฿/rai x 500 rai = 160,000 Baht
Fertilizer	240฿/Rai		120,000				120,000	
Lot IV								
Weeding	80฿/Rai			40,000			40,000	400 ฿/rai x 500 rai = 200,000 Baht
Fertilizer	320฿/Rai			160,000			160,000	
Lot V								
Weeding	80฿/Rai				40,000		40,000	480 ฿/rai x 500 rai = 240,000 Baht
Fertilizer	400฿/Rai				200,000		200,000	
Lot VI								
Weeding	80฿/Rai					40,000	40,000	560 ฿/rai x 500 rai = 280,000 Baht
Fertilizer	480฿/Rai					240,000	240,000	
Total		672,500	160,000	200,000	240,000	280,000	1,552,500	Total 3,105 ฿/Rai Total Sum 1,552,500 Baht

While Bureau of Rubber Planting Aid Funds requires grants from Farmers' Aid Fund the amount of ฿ 2,355,529 Million, the Agriculture Extension Department who is responsible for supplying seedlings to the project will also obtain budget ฿ 810,000 (see following table).

Budget Requirement for Propagation Plots Seed
Multiplication for Koh Samui
Coconut Replanting Project

Wage & Salary	151,200
- Agriculturist (B.Sc.)(1750 ฿)x 1	21,000
- Agriculturist, Diploma (1550 ฿) x 1	55,800
- Helpers (750 ฿) x 6	54,000
- Drivers of Tractors & Trucks (850 ฿) x 2	20,400
Expenses	13,550
- Vehicle Maintenance	13,550
Supplies	40,000
- Fuel & Lubricants	20,000
- Agricultural Supplies	20,000
Fixtures	319,000
- Trucks - one ton capacity	76,000
- Eight types of implements for Tractors	243,000

Land & Structure	276,250	Koh Samui Island
- Land Preparation	20,000	"
- Centre's Building	50,000	"
- Seed Multiplication building	25,000	"
- Houses for Agriculturain	72,500	"
- Raw Houses for Worker	108,750	"

It must be note that the cost of 3.2 million baht discussed above does not include the subsidy to the farmers during the gestation period when the yields are not ready.

Analysing the cost of replanting per rai is very difficult at this stage, but the fertilizer cost is 1,640 baht per rai for five years.[1/] In Sri Lanka the total cost of replanting coconut is estimated at US $780 per hectare and the cost of fertilizer for six years amounting to US $63 per hectare.[2/]

The benefit to be derived from the project is also difficult to forsee at the present price, but it will be taken as the cost of gaining experiences; it could be well with a trial so that the result could be applied in other areas.

1/ See statement No. 3 which was calculated by Agriculture Department.

2/ ADB volume three p. 32.

4.5. Financial Analysis

Based on the project, the seedlings to be used are "Thai Tall Selected" a variety of which 100,000 are supposed to be supplied by Agriculture Extension Department. Thai tall select is known to be a good yielding variety. The maximum average yield on good soil and in favorable growing condition is conservatively placed at 60 nuts per tree.[1/] The life of the palm is about 70 years with a decline in yields starting after approximately 50 years.

The following table is the yields projection of selected Thai tall. This variety starts to bear fruit in the sixth year after planting. The highest yield period is between the 15th year and 50th year, that is 60 nuts and the lowest is 22 nuts in the 6th year. This comes up to 506 nuts per rai in this year and 1,380 nuts in the highest period with 23 palms per rai.

We can calculate the cash in flow, cash out flow and net cash flow per rai from Table 4.1 above. With the farm gate price of 1.5 baht per nut, we can derive the cash in flow by multiplying the yield in each year with its price.[2/] The cash out flow here is the operating cost and fertilizer cost which the Agriculture Department calculated roughly per rai annually. The net cash flow per rai is simply the result of cash

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1/ Hunting team p. 21.

2/ See Table 3.5.

Table 4.1

YIELD PROJECTIONS: THAI TALLS

nuts per tree and Rai

Site Condition and Assumption	Year of Planting													
	4	5	6	7	8	9	10	11	12	13	14	15-50	60	70
Selected seed on island soil with fertilizer			22	28	32	37	42	47	52	54	58	60	50	90
23 palms/Rai			506	644	736	851	966	1,081	1,196	1,242	1,334	1,380	1,150	690

Source: Basic data from Hunting team Table 3.4.

out flow minus cash in flow. (See Table 4.2)

In addition, we can analyse the farm budget shows returns from various sizes of holdings. The emphasize here is only small holdings of 15 rai. The objective is to examine the magnitude of farmer's indebtedness and to determine the number of years during which financial assistance would be necessary.

The cumulative cash flow is shown in Table 4.3 and diagrammatically in Figure 4.1. The farmer achieves a positive cash flow in year 11 onward. The year of maximum indebtedness is the 5th year. However, it should be noted here that our analysis ignores interest rate and subsistence cost of the farmer.

Table 4.2

NET CASH FLOW

Baht per rai

	Year of Planting																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15-50	60	70
Cash in Flow with* price 1.50 ฿ per nut						759	966	1,104	1,276	1,440	1,621.5	1,794	1,863	2,001	2,070	1,725	1,035
Cash out Flow	1,031	320	400	480	560	560	560	560	560	560	560	560	560	560	560	560	560
Net Cash Flow	1,031	320	400	480	560	199	406	544	716	889	1,061.5	1,234	1,303	1,441	1,510	1,165	475

* Farm gate Price is 1.50 ฿ per nut, See Table 3.5.

Table 4.3

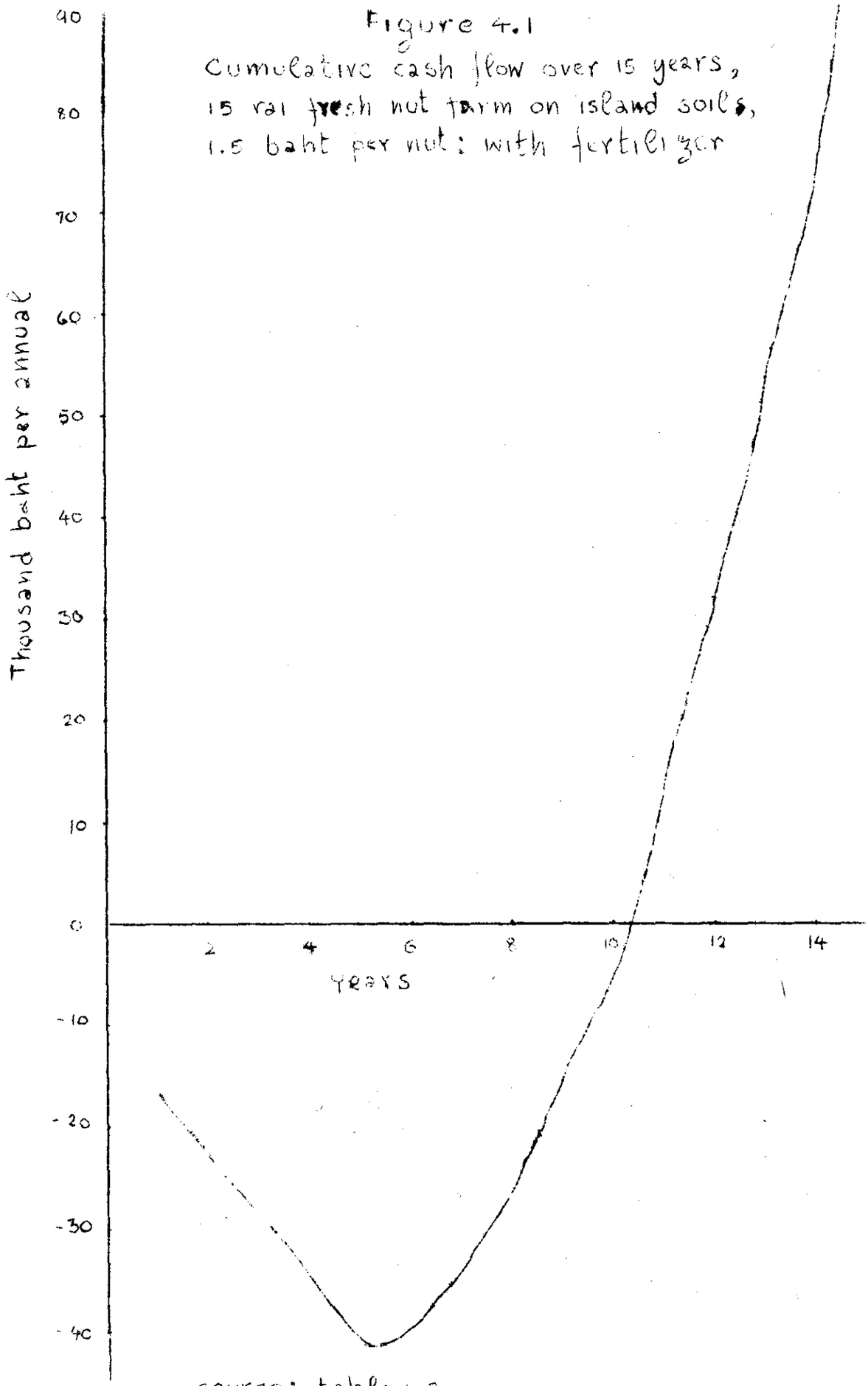
THAI TALLS FARM BUDGET: PER RAI AND 15 RAI
FARM ISLAND: FRESH FRUIT, 1.5 BAHT PER NUT
AND COST LEVELS: WITH FERTILIZER

Year	Gross Revenue	Farm Costs	Net Cash Flow	Cumulative Cash Flow (per rai)	Cumulative Cash Flow (15 Rais)
1	-	1,031	-1,031	-1,031	-15,465
2	-	320	- 320	-1,591	-23,865
3	-	400	- 400	-1,911	-28,665
4	-	480	- 480	-2,311	-34,665
5	-	560	- 560	-2,791	-41,865
6	759	560	199	-2,592	-38,880
7	966	560	406	-2,186	-32,790
8	1,104	560	544	-1,642	-24,630
9	1,276	560	716	- 926	-13,890
10	1,440	560	889	- 37	- 555
11	1,621.5	560	1,061.5	1,024.5	15,360
12	1,794	560	1,334	2,258.5	33,877.5
13	1,863	560	1,334	3,561.5	53,425.5
14	2,001	560	1,441	5,002.5	75,037.5
*15-50	2,070	560	1,510	6,512.5	97,687.5

* The cumulative cash flow for 15 rais of the year after 15th is just added 22,650 Baht to each respective year.

Figure 4.1

Cumulative cash flow over 15 years, 15 rai fresh nut farm on island soils, 1.5 baht per nut: with fertilizer



source: table 4.3

Chapter V

CONCLUSION AND RECOMMENDATION

Coconut production in Thailand is estimated at 1,000 million nuts a year which the actual number of statistics available are quite confusing and may be even unreliable. The expansion of the coconut production in terms of area planted has been quite noticeable, but the production growth rate always lags behind the planting rate. However, the old trees are prevailing especially in the South-the densest coconut growing area. The present trees are of low quality because of the following factors: (1) there is no system in the selection of seeds, (2) lack of care and scientific method of farming, and (3) insufficient application of fertilizer. As a consequence, yields are too low compared with those in other countries.

Many possibilities are available to traditional farmers to increase production e.g., through the selection of high yield varieties. But this task is quite technical and time-consuming and without government assistance is impossible to succeed. Others are through the use of fertilizer, an intensive control of diseases and intercropping. It has been shown, through Agriculture Experiment on the effect of fertilizer in 1974, that there is no concrete proof or evidence yet to substantiate the claim that higher productivity through an intensive application of fertilizer benefits the farmer. At the existing market price structures of both coconut and fertilizer, the traditional method is normally found practised in Thailand. (See pp. 24-36)

Copra production in Thailand in any one year is estimated to be far below the actual demand. This trend seems to be increasing at a rapid rate in recent years. Its quality is, of course, sub-standard. The shortage of coconut for industrial purposes not only acts as barrier to industrial growth but also does a lot of damage to the coconut processing industry.

Coconut marketing like other agricultural products is a complex operation. The price is firmly under the control of middlemen who exist in a spectrum of layers, producing a chain of transactions starting from the growers until the ultimate consumers - a process which contains many sub-markets. The farmers are only price takers at level less than the retail price. There are three kinds of coconut markets i.e., 'local grower's', 'assembly wholesale' and 'terminal market'. While Bangkok is the largest terminal market, Chumpon has the highest number of wholesalers and Surathani is one of the biggest growing province. The structure of copra market and characteristics of its dealers are very much similar to those in fresh nut trade. Coconut growers are always put a disadvantageous position when trading takes place. Copra trading is also to the disadvantage of the producers especially when quality evaluation is concerned. The only means to prevent this kind of exploitation is to build up a countervailing power against middlemen. Some kind of a farmers' organization must be quickly organized to take care of the marketing activity to neutralize the bargaining power of the middlemen. Present cooperative system may be useful but its efficiency and seriousness have to be reconstructed.

As far as coconut price is concerned, it is determined by the interaction of market demand & supply. Supply is constrainted by the planting area and the yield per tree of coconut. On the demand side it depends on the demand for domestic household consumption, for export and for industrial uses. However, the aggregate demand is quite unstable and its movement is rather short-lived. An examination of the wholesale price trend reveals that in the long run, the price slowly shifts upward at the average rate of only 1.28 percent per annum while other cost of production such as fertilizer price increases at an average rate of 12.79 percent per annum and the general consumer price index increases at about 8.8 percent a year. Therefore, on the average, the farmers are on the losing side all the way and in all aspects.

The fresh nut market and import demand for copra are the most influencial on the copra price. High fresh nut price always spells the high copra price. The coconut oil price also has a close relation with the copra price and the prevailing market demand.

It should be noted that the coconut price differential between what the farmers get and the final wholesale price is quite a gap. It ranges from ฿1.65 (2.50-0.85) in June to ฿1.91 (3.00-1.59) in February. But after examine the distributive share of coconut price at the final retail market, it is clear that the total profit accrued to the traders at all levels (see page 101) is only 9.3 percent of the retail price where the largest share goes to the farmers at 66.67 percent. Also the distributive share in the copra trade including oil extraction is similar to that of fresh nut market pattern.

The Ministry of Agriculture has launched the replanting project in Koh Samui island on a pilot basis. It is conducted by Rubber Planting Aid Fund Bureau. The replanting areas will cover only 500 rai due to budget constraint. The period of the project was originally planned for five years (1976-1980), but has been posponed to start in 1977 because of delayed Cabinet approval.

The objective of the project is just to study cost data to be used for planning of coconut development areas in the near future. Using the replanting cost estimated by Agriculture Department, we can calculate the small farmer budget (15 rai holders) by taking a look at cash in flow and out flow. The farmer achieves a positive cash flow in year 11 onward. The year of maximum indebtedness is the 5th year.

RECOMMENDATION

In view of the fact that the largest production of coconut areas is in the 13 provinces of the South, the government should organize some kind of a farmer's organization for bargaining power in saleing their products. Such organization should be classified into levels, i.e., local, district and provincial level. One district or provincial level must be the centre of the rest in each province. Each level of organization has to have a storage or warehouse and working funds for its members' expenditure. These organizations should be set up in every province to avoid competition among each others they have to have coordination and to support each other.

Improvement of selling in a large market such as Bangkok market should be made by bidding. Coconuts must be classified into three sizes i.e., small, medium and large. Farmer organization set its minimum price by their own. Such minimum price should be revised in each bidding according to market price. It is a fair price to the farmers because of there are many competitive buyers. Farmers can also release their stock otherwise huge storages have to be built. Furthermore they are ready to receive new product comming in.

To promote good quality of copra, it must be made of ripe coconut, introducing kilns of improved design to the small holder and encouraging cooperative processing.

Marketing information services should be provided among the farmer organizations.

Throughout our economic analysis of coconut in Thailand, we have faced an unreliable data. Not only basic data available but research on coconut has been poorly documented. We recommend, therefore, that the major emphasis should be given now an establish a data collection and analysis unit in any coconut research station. This will be very helpful in the preparation of a major replanting programme.

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