

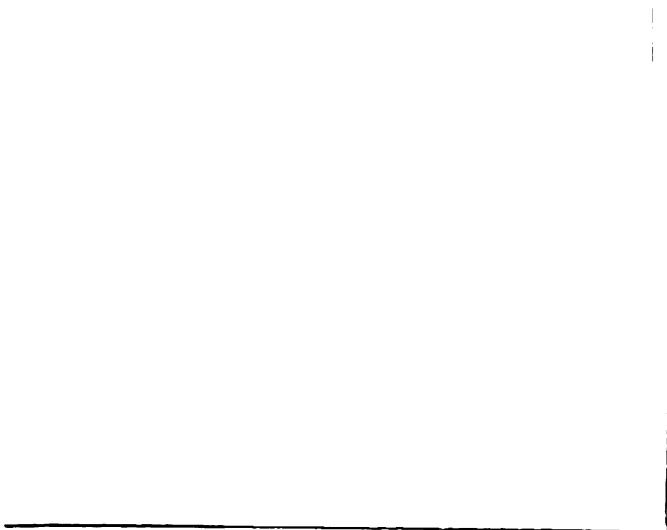
THE CORN PRODUCTION SECTOR OF THAILAND  
WITH SPECIAL REFERENCE TO CORN EXPORTS

Thesis for the Degree of M. S.  
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PANIDA JONGPUTISIRI

1970







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THE CORN PRODUCTION SECTOR OF THAILAND  
WITH SPECIAL REFERENCE TO CORN EXPORTS

By

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## CHAPTER I

### INTRODUCTION

The purpose of this paper is twofold: first, to systematically examine the present organization in the marketing of corn in Thailand; and second, to compare and contrast the present situation with a proposed system of marketing.

This research will involve a brief study of the situation as it existed in the past, an understanding of the nature and mechanics of the present system, and finally, an assessment of the direction in which the present system seems to be headed thus making it possible to set forth possible implications for corn exports policies for both government and the private business sector.

In more specific terms the three main objectives of this study can be stated as follows:

1. To define the existing organization and structure of the corn industry in Thailand;
2. To analyze the economic problems faced by the Thai corn sector in the light of uncertainty of the future international corn market; and
3. To suggest changes in the existing market organization and structure designed to increase farmers' income and



the national export revenue.

Before proceeding further, a comment is in order regarding the second objective mentioned above. Mention was made about the uncertainty of the future international market and the economic implications for the Thai corn sector. To provide some indication of the degree of uncertainty involved, monthly export price figures for corn for the years 1963 to 1969 are presented in Table 1.

Table 1

AVERAGE EXPORT PRICE OF CORN (F.O.B. BANGKOK) AND 7-YEAR  
AVERAGE, THAILAND, 1963-1969<sup>1</sup>

(dollars per metric ton)

Mon. \ Yr.	1963	1964	1965	1966	1967	1968	1969	7-year average price
Jan.	52.56	60.54	55.10	57.32	56.18	56.74	54.81	56.18
Feb.	57.51	61.07	65.41	49.01	55.80	56.07	59.84	57.82
March	62.20	61.32	68.79	52.08	55.01	56.22	62.43	59.72
April	57.74	59.98	71.68	52.99	54.94	55.95	62.38	59.38
May	57.93	60.78	73.36	52.39	56.95	57.04	56.89	59.34
June	58.04	60.79	72.27	51.65	56.18	66.94	56.34	60.32
July	57.06	59.33	65.86	50.14	55.68	69.79	55.51	59.05
Aug.	57.20	56.64	61.96	49.90	54.94	65.43	52.47	56.93
Sept.	55.78	56.02	59.44	49.32	50.95	60.27	51.35	54.73
Oct.	54.99	56.00	59.39	54.48	50.16	59.21	48.84	54.72
Nov.	55.04	56.29	57.43	55.54	53.23	57.09	47.01	54.72
Dec.	58.16	58.32	49.12	53.84	56.30	56.70	49.51	54.56
Avg.	56.85	58.92	63.32	52.39	54.69	59.79	54.78	57.27

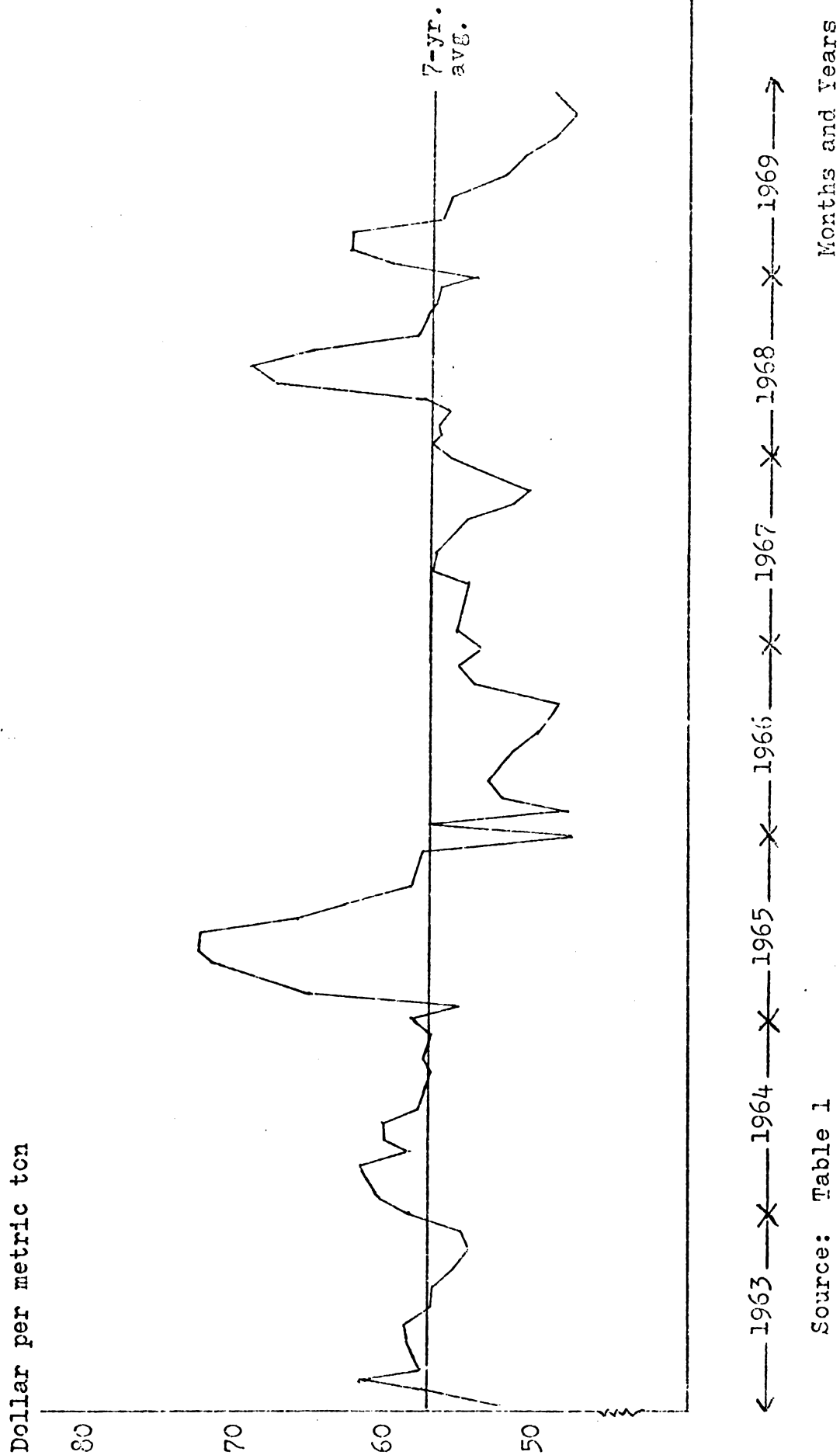
<sup>1</sup>The 7-year average is not less than the prices noted by the Ministry of Economic Affairs, Thailand.

Source: Data 1963-1967, Department of Foreign Trade, Ministry of Economic Affairs, Thailand, March 1970.

Data 1968-1969, provided by Dr. Delane E. Welsch, Rockefeller Foundation, May 1970.



Graph 1: FLUCTUATION OF EXPORT PRICE OF CORN BY MONTHS, THAILAND 1963-1969





The above figures are presented in graphical form in Graph 1. The average for the seven years was found to be \$57.30 per metric ton. Substantial deviations from the average occurred especially in the years 1965 and 1968. Furthermore the years 1966 to the first half of 1968 showed consistently below-average prices. These facts underline the existing uncertainty of corn prices, the reason being that Thailand possesses only five percent of the total world market for corn.<sup>1</sup> Therefore, the export price is heavily dependent on the output of major corn producing countries as well as demand on the international market.

Another major source of uncertainty is that exports to Japan, which comprised 43 percent of total exports in 1968, are on contract with the Japan Feed Grain Trades Association which is a Japanese government sanctioned monopoly.<sup>2</sup> Thus should the Japanese government decide to terminate the contract at any time, or should it decide to cut down on the quantity imported, Thailand will have to expand its other markets to absorb its excess supply of corn.

#### Justification and Importance of the Study

Agriculture has played an important part in the economy of Thailand and it is expected to play the same pivotal role in the future. To support this statement, a comparison of

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<sup>1</sup>USDA, World Agricultural Production and Trade: Statistical Report, September 1969, pp. 38-39.

<sup>2</sup>Dr. Delane E. Welsch and others, Research for Planning Corn and Sorghum Development in Thailand, 1968, p. 70.



growth of Gross National Product and the growth of Agriculture Production is made by comparison of their indexes from the years 1953 to 1963. Table 2 presents this comparison.



Table 2

INDICES FOR GNP AND AGRICULTURAL PRODUCTION,  
THAILAND, 1953-1966

(1953 = 100)

Year Item	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
GNP*	100	113.4	139.4	145.0	148.3	153.9	171.3	195.2	205.8	223.4	239.6
Agric. Prod.*	100	122.5	129.2	150.9	169.9	170.1	223.3	300.5	273.8	286.3	327.9

\*Figures rounded to the nearest tenth.

Source: Department of Technical and Economic Cooperation, Thailand: Facts and Figures, (Bangkok: 1965), p. 104 & p. 116.



Table 2 shows that GNP has increased from an index of 100.0 in 1953 to an index of 239.6 in 1963 or an increase of about 100 percent in ten years. During the same period the index for Agricultural production rose from 100 to 327.9 or an increase of more than 200 percent. This shows that since Agricultural production has been increasing faster than GNP during the years mentioned above, Agriculture must have been a major factor in the determination of the direction of the economy. It may also be mentioned that in 1965, four-fifths of the country's total working population was engaged in agricultural employment and that agriculture contributed over one-third of national income.

Corn is one of the major upland crops in Thailand, and it has been produced and consumed as a vegetable for many years. However, corn is neither a staple food for the Thai people nor is it regularly used for animal feed. Nevertheless, production has been increasing through the years and today it is one of the most important export items in Thailand. Table 3 shows that in 1967, corn was the fourth largest export product of Thailand, after rice, tin and rubber.

As shown in Table 3 the export value of corn has risen from 74 million baht in 1957 to 1,356 million baht in 1967 or an increase of close to 1700 percent in ten years. This makes corn the fastest growing export item of Thailand for the years 1957 to 1967, making Thailand the world's fourth largest exporter of corn in 1966, after the United States, Argentina and France (see Table 4). Table 4 also points out that Thailand has held a relatively stable share of the world



market for corn since 1959. This makes corn production one of the major factors contributing to a favorable balance of payments position.

According to Agricultural Statistics of Thailand (1966), the index of area used for corn production rose from 100 in base year 1953 to 1,535 in the year 1966, while the index of production area for upland food crops rose from 100 to 650 during the same period.<sup>3</sup> This indicates that the agricultural area used for corn grew more than twice as fast as the agricultural area utilized for general upland food productions. A breakdown of the utilization of agricultural product areas for the upland products is presented in Table 5.

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<sup>3</sup>Agriculture Statistics of Thailand, Ministry of Agriculture, Bangkok, Thailand, 1966, p. 35.



Table 3

VALUE OF EXPORTS OF PRINCIPAL PRODUCTS,  
THAILAND, 1957-1967

(in million baht)<sup>1</sup>

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Rice	3,622	2,968	2,576	2,570	3,598	3,240	3,424	4,389	4,334	4,001	4,622
Rubber	1,406	1,326	2,336	2,579	2,130	2,111	1,903	2,060	1,999	1,861	1,565
Tin	531	255	434	537	617	685	741	962	1,166	1,316	1,822
Corn	74	183	250	551	597	502	828	1,346	969	1,520	1,356
Teak	262	239	244	356	252	170	137	179	201	243	197
Tapioca Products	133	192	224	288	446	423	439	653	676	644	756
Jute and Kenaf	46	69	88	230	626	579	358	495	1,102	1,614	885
Others	1,461	1,214	1,408	1,644	1,131	1,819	1,846	2,255	2,494	2,900	3,012
Total	7,540	6,446	7,560	8,614	9,997	9,529	9,676	12,339	12,941	14,099	14,254

<sup>1</sup>A baht equals 5¢ in U.S. dollars.

Source: Bank of Thailand, Thailand Monthly Report, September 1968, Vol. VIII, No. 9, pp. 46-47.



Table 4

SHARE OF WORLD CORN MARKET OF EACH MAJOR  
EXPORTING COUNTRY, 1959-1966

(percent of total)

Country	1959	1960	1961	1962	1963	1964	1965	1966
U.S.A.	34.0	47.2	53.6	54.7	33.2	55.1	66.6	63.7
Argentina	26.0	21.6	12.4	14.8	11.7	15.1	12.3	15.4
France	0.4	2.3	5.0	0.8	1.7	3.7	2.5	5.3
Thailand	2.3	4.3	4.1	2.4	3.6	5.2	3.6	5.0
Mexico	-	3.8	-	-	1.3	5.9	3.5	3.5
Yugoslavia	3.1	4.3	2.7	1.4	0.5	0.1	0.2	1.5
South Africa	4.0	4.8	7.7	10.5	11.9	6.4	1.4	0.2
U.S.S.R.	1.5	1.0	2.9	6.3	3.5	2.9	-	-

Total Major Exporters	71.3	89.3	88.4	90.9	67.4	94.4	90.1	94.6
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Source: F.A.O. Monthly Bulletin of Agricultural Economics and Statistics, July-August 1968, p. 34.



Table 5

INDEX NUMBERS: AGRICULTURAL AREA DEVOTED TO  
UPLAND CROPS, THAILAND, 1950-1966

(1950-1953 = 100)

Year	Rice	Corn	Mung Beans	Cassava	Sugar Cane	Total
1950-53	100	100	100	100	100	100
1954	96	124	93	107	137	122
1955	100	130	102	98	148	129
1956	104	193	103	63	173	154
1957	88	228	112	274	183	188
1958	100	298	119	315	188	214
1959	105	470	137	445	211	285
1960	103	671	155	511	225	354
1961	107	720	108	710	177	353
1962	116	771	147	877	145	375
1963	115	982	298	994	213	503
1964	114	1,297	300	745	232	573
1965	112	1,355	357	724	202	586
1966	128	1,535	398	930	178	650

Source: Agriculture Statistics of Thailand, 1966, Ministry of Agriculture, Bangkok, Thailand, p. 35.



Corn in Thailand is produced mainly for export. Considering this fact, it becomes necessary to examine the world market situation and its effect on the Thai corn sector. It is equally important that an effort be made to develop improved methods of processing corn in order to expand domestic sales. A study also has to be undertaken regarding the feasibility of successfully marketing corn in the European market. At present very little Thai corn is sold in Europe and this has been the consistent pattern since 1957. Table 5 indicates that the European market has only averaged about one percent of the total corn exports of Thailand in the period 1957 to 1968. Probable reasons for this situation may be the following:

1. the excessive cost of transporting corn to Europe which has the effect of raising the price of Thai corn beyond reasonable levels;
2. the existence of effective substitutes in the European market, weakening the demand for corn;
3. the leadership of France in the European corn market, and,
4. the possibility that Thai corn is considered substandard in Europe.

At present Thailand is trying to develop its livestock industry for the purpose of supplying the domestic demand and foreign exports. There is also a move towards establishing an animal food industry using corn as the base ingredient because of its high protein content.

Domestic demand for corn will most probably increase due



Table 6

VOLUME AND VALUE OF THAILAND'S CORN EXPORT, 1957-1968  
(in tons and million bahts)

Year	Hongkong		Singapore		Malaysia		Italy	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
1957	2,925	4	9,586	11	15,438	19	-	-
1958	3,879	4	14,880	17	14,471	17	-	-
1959	9,876	11	17,507	18	20,110	20	-	-
1960	11,327	12	35,441	37	24,829	26	-	-
1961	43,511	47	82,417	87	31,119	33	-	-
1962	102,910	111	92,281	101	45,453	51	-	-
1963	111,642	218	78,848	91	49,655	58	34,565	58
1964	108,079	133	73,774	93	50,612	64	-	16
1965	81,832	104	81,601	101	53,912	69	12,000	-
1966	76,856	97	142,260	179	66,653	85	11,928	14
1967	82,507	103	100,063	128	67,291	85	8,000	11
1968	130,600	137	145,512	151	110,525	117	-	-



Table 6 (Cont.)

## VOLUME AND VALUE OF THAILAND'S CORN EXPORT, 1957-1968

(in tons and million bahts)

Year	Japan		Taiwan		Other		Total	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
1957	36,393	40	-	-	1	-	64,337	74
1958	129,683	145	-	-	1	-	162,914	183
1959	189,185	201	-	-	103	-	236,781	250
1960	441,046	474	2,052	2	50	-	514,745	551
1961	405,404	426	719	1	4,167	3	567,236	597
1962	229,676	237	-	-	1,995	2	472,405	502
1963	453,414	496	9,911	12	6,011	5	744,046	828
1964	844,936	1,010	9,573	12	14,482	18	1,115,041	1,346
1965	559,749	662	8,940	11	18,296	32	804,380	969
1966	826,289	1,027	57,116	71	37,435	47	1,218,537	1,520
1967	670,612	821	143,993	183	18,296	24	1,090,762	1,355
1968	605,459	685	395,475	424	33,086	41	1,480,657	1,555

Source: Department of Custom, Ministry of Economic Affairs, Bangkok, Thailand, March 1970.



to growth in population and efforts to find new uses of the product and new ways of marketing them in the international market. Therefore specific ways and means to stabilize domestic demand and to increase productivity in order to meet both the domestic and foreign market demand are of great importance.

A second reason for the importance and justification of this study hinges on the marketing system itself. It is possible that in this area some problems occur between producers and consumers, in the production and marketing systems, and the employment of modern technological advances in this area. Specifically, the problems mentioned above may involve transportation systems, the grading of corn, storage, standardization, processing, packaging, and purchasing and selling practices.

The quantity of corn planted is dependent both on the price of corn and the relative ease or difficulty in producing and marketing the product. Thus an investigation of the costs involved in the production and marketing of corn as well as a proper understanding of its present set-up may provide better perspective of the problems involved. This may provide valuable hints for a possible reorganization of Thailand's corn-producing sector which would enable it to cope more effectively with the demand of both the domestic and foreign markets.



The First Five Year Plan of the corn producing sector under the development plan provided for the production of 544 thousand tons of corn.<sup>4</sup> According to the National Development Board estimate the output of corn will show an increase of 50 percent during the Second Five Year Plan (1967-1971) and will be around 1.5 million tons by that time. This target, however, appears to be slightly ambitious because for 1966, the target of output was 1.2 million tons but the actual output rose to only 1.12 million tons.<sup>5</sup>

The least square estimate (see Chapter III) indicates that in 1971 the output of corn will be 1356.84 thousand tons. To sum up it may be pointed out that the corn output might fall short of the target at the end of the present plan. In 1965, Thailand exported 812 thousand tons of corn out of one million tons of total production. It is estimated that by the end of the present plan (1971), exports will increase 1.3 million tons and 100 thousand tons will be used for domestic consumption. Thus, the National Economic Development Board expects the proportion of exports to total production to rise from 81 percent to 87 percent during the Second Five Year Plan.<sup>6</sup>

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<sup>4</sup>The Second National Economic and Social Development Plan, (1967-1971) National Economic Development Board, Bangkok, Thailand, p. 12.

<sup>5</sup>Ibid., p. 55.

<sup>6</sup>Ibid., p. 161.



## CHAPTER II

### PROBLEM IDENTIFICATION

This chapter is designed to examine the problems that are confronting the corn marketing system in Thailand. A brief mention of the problems with respect to corn export was made in Chapter I. It also gave passing reference to the problems of domestic demand for corn. In this chapter, however, an attempt will be made to identify these problems in detail.

#### Export Market for Corn:

Table 4 and Table 6 in Chapter I presented a description of corn exports for Thailand. It can be seen from Table 4 that between 1959-1966 Thailand's share of the world's export trade in corn increased from 2.3 percent to five percent. She is the fourth largest corn exporter in the world, even though 80 percent of all corn exports still come from the U.S.A. and Argentina. Table 6 gives an impression of the tremendous increase in the export of corn from Thailand between 1957-1968. During this period, total exports of corn increased from 64.3 thousand tons to 1480.7 thousand tons, whereas the value of exports increased from 74 million baht to 1,555 million baht. The volume in 1968 was 23 times that in 1957 and the value in



1968 was 21 times that in 1957. Though these figures are impressive, there are certain problems which may dampen the Thai corn exports in the near future. These problems can be identified as the problems encountered in the domestic market and international marketing of corn.

#### Domestic Market Problems:

There are a number of domestic market conditions which create problems in the export trade of corn. They include a) inaccurate estimate of production, b) reluctance to adopt new technology, c) corn movement from up country to Bangkok, d) instability of the price and, e) lack of cooperation among the members of various corn exporting associations until 1962.

#### Inaccurate Estimates of Corn Production:

The estimates of annual corn production are still not accurate and a wide gap between the supply and demand frequency occurs due to the inaccurate reporting of production.<sup>1</sup> Even though the acreage and output of corn have shown an increase during the past two decades, still due to lack of information available to the farmers and also due to inadequate capital, the yield of corn has not recorded the expected increase. Farmers are suspicious of government agents and hesitate to adopt new techniques. The output of corn could have shown a higher increase than what has been reported if these constraints had not been there.

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<sup>1</sup>Sopin Tongpan, Thai Corn Export Problems, Kasetsart University, Bangkok, Thailand, March 1970.



### Corn Movement From Up Country to Bangkok:

As has been explained in Chapter IV, the transportation system between the corn producing area and Thailand is not satisfactory. This results in irregular movement of corn from the upland area to Bangkok which is the principal center for distributing corn for domestic use or for export. This, however, gives rise to the third problem of instability of prices.

### Instability of Corn Prices:

Chapter I presented an account of the f.o.b. Bangkok prices of corn during different months of the year (see Graph 1). These oscillations reflect the instability in the price of corn and act as a disincentive in the adoption of the package of improved seeds, fertilizers and farm implements by the farmers.

### Lack of Cooperation Among the Exporters:

Japan has been the principal importer of Thai corn and thus the attention of corn exporters has been focused on Japan. Until 1962, a few cooperative associations of corn exporters were formed in Thailand to take care of the corn export trade. But the distortions in the domestic market, i.e., the disparity between export and domestic prices would not permit the members of these associations to remain loyal and comply with the necessary regulations. For instance, when the domestic price of corn exceeded the export price, the individual exporter would be tempted to sell in the domestic market and



break the contract with the Japanese trader. On the other hand, when the prices of corn in the domestic market were lower than the export price, the trader who did not have any contract with the Japanese importer would approach the latter, and offer corn at a lower price. Since 1962, due to regulation of corn exports by the Thai government such arbitrary behavior on the part of exporters have been considerably controlled, yet as has been pointed out below, the discrepancy between the contracted quantity and the actual export continues (see Table 7).

Table 7

CONTRACT VOLUME AND ACTUAL EXPORT OF CORN  
BETWEEN THAILAND AND JAPAN, 1965-1970

Year	Contract Volume (metric tons)	Actual Export (metric tons)
1965-66	800,000	559,749
1966-67	800,000	826,289
1967-68	820,000	670,612
1968-69	780,000	605,459
1969-70	600,000	-

Source: Monthly Economic Report, Department of Foreign Trade, Bank of Thailand, 1970.

Since 1962, however, the nature of the discrepancy has changed. Previously, the contracted quantity fell short or exceeded the actual exports on account of the arbitrary behavior of the individual exporters. But now, more exports



than the contracted quantity can result only through negotiations between the department of foreign trade of the Ministry of Economic Affairs of Thailand and the Japanese Feed Trade Association (JFTA), a group of Japanese Feed Grain Importers.

International Market Problems:

With respect to international marketing of corn, Thailand is currently facing two interrelated problems, namely, the predominance of Japan as an export market and the dwindling prices of exportable corn.

Predominance of Japan in the Corn Exports:

As Chart 2 indicates, Japan is the most important buyer of Thai corn, though the share of Japan in total exports has declined from 56.6 percent to 40.9 percent between 1957-1968. Such dependence, however, is to the disadvantage of Thai corn exporters because the Japanese traders can impose their terms in the trade arguments. Already there are indications that Japan is buying more of her corn requirements from other countries. Table 8 indicates the amount of corn which Japan imported from different countries during the period, 1955-68.



Table 8

VOLUME OF JAPANESE CORN IMPORTS BY COUNTRY,  
AVERAGES 1955-1959, ANNUAL 1965-1968

(thousand metric tons)

Year Country	1955-59	1960-64	1965	1966	1967	1968
U.S.	252	867	2,302	2,234	1,584	2,542
Burma	7	1	1	3	-	-
Cambodia	25	29	26	29	20	15
Indonesia	2	-	4	65	120	10
Thailand	69	432	576	767	699	633
Other	202	946	525	500	547	1,944
Total	557	2,275	3,434	3,598	3,960	5,144

Source: Japanese Efforts to Diversify Sources of Agricultural Imports, Economic Research Service, U.S.D.A., April 1970, p. 6.

Beyond 1960, corn imports in Japan have doubled, but the share of Thailand in Japanese imports has declined considerably (Table 9). This suggests that while Thai corn exporters place a heavy reliance on the Japanese importers, the latter are presumably looking for other markets where they can dictate their terms. The crucial issue, therefore, is to promote exports of corn in other markets rather than placing such heavy dependence upon a single market. However, the increasing exports to Taiwan have given hope that the Thai corn exporters are aware of the above problem and are making efforts to open new markets in addition to expanding the existing ones.



Table 9

THAILAND'S SHARE OF JAPANESE CORN IMPORTS  
AVERAGE 1960-1964, ANNUAL 1965-1968

(percentage of total)

Year	Share of Corn Imports
Average: 1960-64	19.0
Annual:	
1965	16.9
1966	21.3
1967	17.7
1968	12.3

Source: Japanese Efforts to Diversify Sources of Agricultural Imports, Economic Research Service, U.S.D.A., April 1970, p. 2.

Problem of Declining Export Prices:

Table 6 of Chapter 1 indicates that the export earnings of corn declined from 1150 baht to 1050 baht per ton between 1957-1968. This is roughly a nine percent decline in the value of corn exports of Thailand. The continuation of this trend will adversely affect the export of corn. In fact, Thai exports have to compete with the low-cost corn producing countries such as the U.S.A., Argentina, Mexico, France, and Brazil. The trend of the world's corn prices due to progressively increasing output is downward, and therefore, this affects the relatively less efficient exporters such as Thailand more than the major suppliers mentioned above.<sup>2</sup> The

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<sup>2</sup>Production, Consumption and Trade of Coarse Grains, U.S.D.A., ERS-Foreign 272 (June 1969), pp. 40, 42, 48.



solution to this problem lies in shifting the emphasis on the export of grains to other forms mentioned in the following chapter.



## CHAPTER III

### CORN PRODUCTION IN THAILAND

#### History:

Guatemala corn is a variety of corn which is at present popularly grown in Thailand. More than 80 percent of the area of cultivation is used for growing this variety. The Guatemala variety was first selected in Antigua, a town in Guatemala, in 1946 under the management of the Tropical Research Center of the Iowa State University of which Dr. E. I. Malhus was Director. A substantial amount of seed was sent to Mr. Ream, ICA Agricultural Advisor in Thailand in 1952 for yield trials in the country. It was found that this variety was remarkably adaptable to the climate of Thailand. Although the yield of Guatemala corn was not particularly high, it was found to be an open-pollinated variety that could be further propagated right in the country. Furthermore it had several seed characteristics which were desirable in foreign markets.

The Thai Department of Agriculture then decided to multiply corn seeds in order to be able to distribute them to the farmers. More seeds were then imported from Guatemala and multiplication was started at Kaset Klong, Bang Khen in 1953. The second lot of seeds was sent to several Agricultural Experiment stations in the corn-growing regions. Demonstra-



tions regarding the relative advantages of Guatemala corn compared with the currently popular variety were made to farmers with the purpose of obtaining their support and acceptance. In this way the new variety of corn was spread widely among the farmers throughout the country.

Table 10 indicates the shift in quantity of production from the unimproved variety of corn to the period from 1950 to 1966. There were no improved varieties of corn produced in Thailand in 1950. In 1966, there were 2,800 hectare of agricultural land used bearing Guatemala and other newly introduced varieties. This was about nine times more than the area of land utilized for the traditional varieties in 1966. Furthermore, the yield of the Guatemala varieties was found to be more than twice as much as that of the Guatemala variety. As a consequence of the widespread acceptance of the Guatemala variety of corn, the total area cultivated with corn increased almost fifteen times in a span of 16 years, jumping from 219,000 hectares in 1950 to 3,113,000 hectares in 1968.

Table 10

CULTIVATED AREAS FOR CORN AND PRODUCTION YIELD  
BEFORE AND AFTER AVAILABILITY OF GUATEMALA VARIETIES

Year	Traditional Varieties		Guatemala Varieties	
	Acreage	Yield	Acreage	Yield
	(1000 hectare)	(metric tons/hectare)	(1000 hectare)	(metric tons/hectare)
1950	219	.12	0	-
1966-68	313	.22	2,800	.45

Source: Global Crop Paper, "Corn," Agency for International Development, May 1969, p. 2.



Geographic Location of Corn Sectors:

Approximately 88 percent of Thailand's corn production is concentrated in nine changwads (provinces), namely Lop Buri, Nakhon Sawan, Saraburi, Nakhon Rachasima, Phetchabun, Phitsanulok, Phitchit, Sukhothai, Kamphang Phet. Among them, Lop Buri, Nakhon Sawan and Saraburi are the most important, having 70 percent of the total production. While these three changwads are major corn production areas, Lop Buri and Saraburi are more efficient in terms of total production per area planted (27 percent of total production from 25 percent of area planted and 17 percent of total production from 15 percent of area planted respectively). Respective data are presented in Table 11.

Table 11

DISTRIBUTION OF CORN PRODUCTION BY VOLUME AN AREA  
(IN PERCENTAGE) - 5 YEARS AVERAGE, 1961/62-1965/66

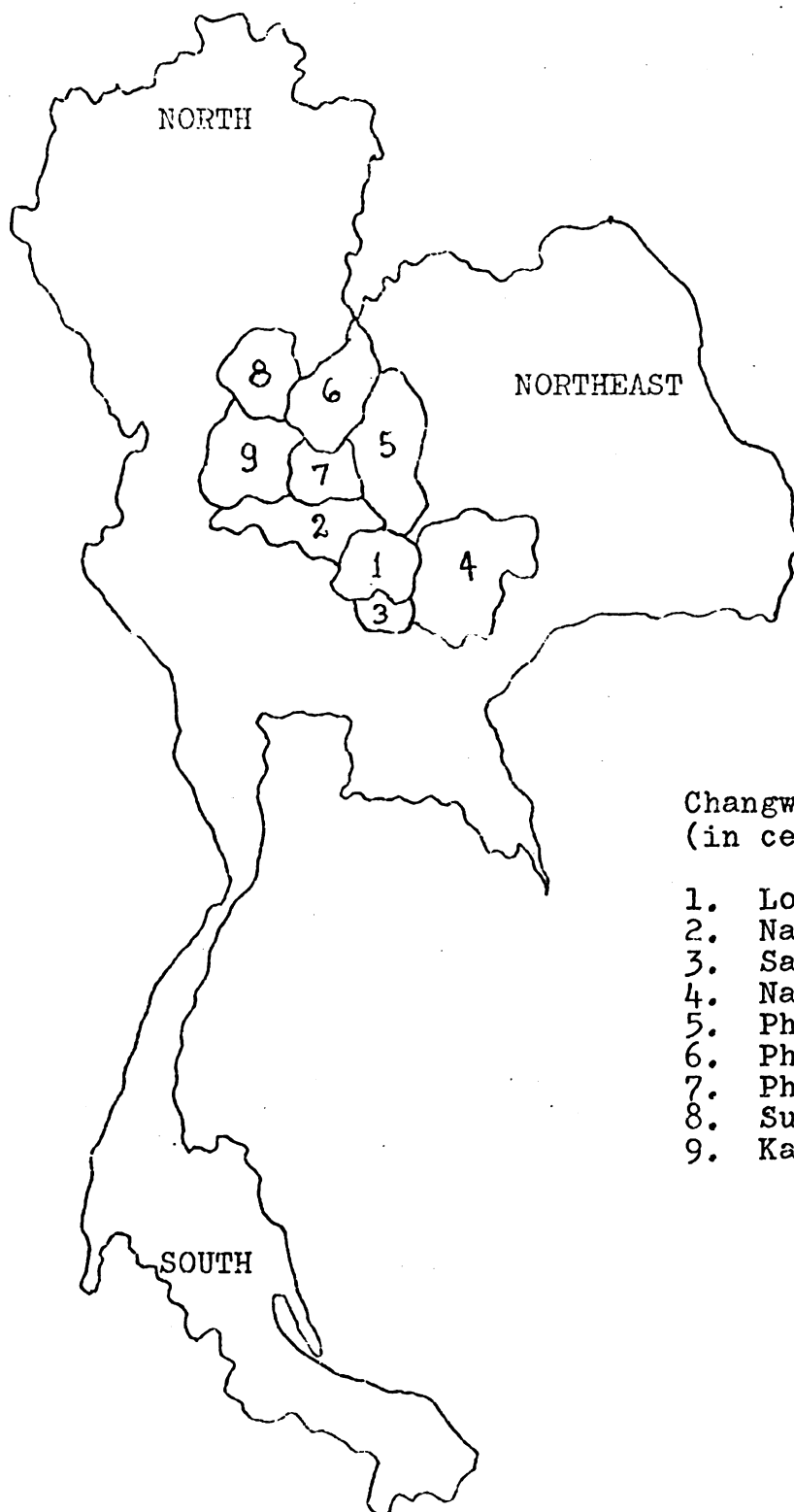
Changwad	Percent of Production	Percent of Total Area Planted
Lop Buri	27	25
Nakhon Sawan	26	26
Saraburi	17	15
Nakhon Rachasima	4	5
Phetchabun	4	4
Phitsanulok	4	4
Phitchit	3	3
Sukhothai	2	2
Kamphang Phet	1	1
Total	88	85
Kingdom Total	100	100

Source: Kasetsart University, November, 1967.



Map 1

LOCATION OF CORN PRODUCTION IN THAILAND  
(9 Leading Changwads)



Changwads  
(in central plain)

1. Lop Buri
2. Nakhon Sawan
3. Saraburi
4. Nakhon Rachasima
5. Phetchabun
6. Phitsanulok
7. Phitchit
8. Sukhothai
9. Kamphang Phet



Planting Season:

Cultivation of corn requires an adequate supply of water which must be obtained either from rainfall or from irrigation. In the central plain area which is the only corn producing area in Thailand, soil and climate conditions are relatively more favorable to corn production. Corn is planted in Thailand during the months of May and July and normally it takes 90-110 days before the crop is ready. The farmer who depends only on rainfall prefers to plant corn with the first rain which usually occurs in May and harvests sometime in August. If adequate rainfall occurs, the second crop can be planted in August and would be harvested in the month of November. It may be mentioned here that rice is planted in the month of July or August (depending on the rainfall) and is harvested during December or January. The second crop of corn therefore, competes with rice.

During the past two decades, however, the yield of corn has increased considerably as compared to rice. As the following table indicates, between 1951-1966 the average yield of rice has increased by 40 percent while the yield of corn has increased by 86.5 percent during the same period. Table 12 also reveals that while the area under rice increased by 28 percent, the area under corn increased by 54 percent during this period. This means, that though corn and rice are competitive crops, the preference for corn is rising, presumably due to its rising demand for exports.

Production, Acreage and Yield of Corn in Thailand:

Table 13 explains the growth of output, acreage and yield of corn (1950-1966).



Table 12

AREA PLANTED AND AVERAGE YIELD OF RICE AND  
CORN IN THAILAND, (1951-1966)

Year	Area planted for rice (1000 rai)	Average yield of rice (kg/rai)	Area planted for corn (1000 rai)	Average yield of corn (kg/rai)
1951	37,245	197	259	163
1952	33,551	196	281	165
1953	38,574	213	298	173
1954	34,732	202	331	191
1955	36,060	218	347	196
1956	37,648	230	514	225
1957	31,726	208	606	229
1958	35,987	218	792	238
1959	37,909	206	1,249	256
1960	37,008	222	1,785	306
1961	38,619	231	1,916	321
1962	41,617	240	2,050	331
1963	41,277	253	2,612	353
1964	40,890	256	3,449	276
1965	40,492	249	3,605	291
1966	47,095	276	4,083	304

Source: Agricultural Statistic of Thailand, 1966, pp. 48, 54.



Table 13

PRODUCTION, ACREAGE AND YIELD OF CORN IN THAILAND  
(1950-1966)

Year	Production (1000 tons)	Acreage (1000 rai)	Yield (kg/rai)
1950	26.9	226	127
1951	41.7	259	163
1952	44.8	281	165
1953	51.1	298	173
1954	62.3	331	191
1955	67.5	347	196
1956	114.8	514	225
1957	136.8	606	229
1958	186.3	792	238
1959	317.2	1,249	256
1960	543.9	1,785	306
1961	598.3	1,916	321
1962	665.4	2,050	331
1963	857.7	2,612	353
1964	935.1	3,449	276
1965	1,021.3	3,605	291
1966	1,122.4	4,083	304

Source: Agricultural Statistics of Thailand, 1966, Bangkok, Thailand, p. 54.



During this period production of corn increased by 41 times, yield increased by two times and the area under corn increased 18 times.

While these indicators of progress are significant, there is little room from complacency. The yield of corn in Thailand is still much lower than many other corn producing countries. Especially, since Thai corn exporters have to compete with their counter-parts in other countries to capture the whole market, lower yields and comparatively higher costs serve as an obstacle in expansion of exports. The following table compares the per hectare yield in the principal corn producing countries in the world. The U.S.A., Canada and France produce 2-2½ times as much per hectare as does Thailand and pose a serious challenge to the Thai corn exporter in the world market because of their higher yield and lower cost of production. Even though Italy and Taiwan are currently importing corn from Thailand, they also have higher yields and in the course of time either they may reduce their imports of corn or may become exporters.

Table 14

YIELD PER HECTARE IN PRINCIPAL CORN-PRODUCING COUNTRIES  
(100 kg/hectare)

Item	Year	Average 1948-52	1966
U.S.A.		24.9	45.4
Thailand		9.1	22.4
Chile		14.2	32.4
Canada		32.0	51.7
France		13.6	45.6
Italy		18.4	35.5
Taiwan		14.1	23.2

Source: FAO, Production Year Book, vol. 21, pp. 55-56.



Estimated Output, Acreage and Yield of Corn:

On the basis of least square method, the following regression equation from Table 13 is obtained:

$$Y_1 = a_1 + b_1 t$$

$$Y_2 = a_2 + b_2 t$$

$$Y_3 = a_3 + b_3 t$$

where  $Y_1$  refers to estimated production

$b_1$  is the coefficient for one unit change in time

$Y_2$  and  $Y_3$  refers to estimated value of acreage and yield respectively while,

$b_2$  and  $b_3$  are the respective regression coefficients for the two dependent variables mentioned above.

Following values have been obtained:

$$1. Y_1 = -263.02 + 73.63t \quad (R^2 = .89)$$

$$2. Y_2 = -762.12 + 244.18t \quad (R^2 = .87)$$

$$3. Y_3 = 133.49 + 12.26t \quad (R^2 = .83)$$

This estimate suggests that our last 16 year period corn producing sector has exhibited enormous upward movement and based on this trend. We can obtain following estimate the production of corn, area planted and yield for the next 10 years (shown in Table 15).

It must be noted that the regression equation  $Y_1$  and  $Y_2$  used in estimating production have negative Y-intercept; however, it is impossible because production must be positive even without the use of fertilizer, modern equipment, etc. Perhaps the reason for this is that for the years 1950-1955, production advanced slowly because modern technology was not



used intensively, whereas the years 1956-1966 represented years of accelerated growth caused by increasing utilization of modern technology. Consequently, it is possible to obtain two regression equations, with the latter years having a greater slope.

It is not feasible to use the earlier years' regression nor the latter years' simply because technology should exhibit more growth in production for 1956-1966 than 1950-1955, and also because continued growth such as that of 1956-1966 is not practical because of diminishing returns to scale. Therefore, the average should represent a better estimate.

#### Seasonality in the Corn Prices:

Seasonal fluctuations in prices are measured by seasonal price indices. The focus of this section will be on the oscillations in the wholesale prices of corn during different months of a year. An attempt has also been made to analyze the factors that are responsible for such seasonal variations.



Table 15

ESTIMATED PRODUCTION, AREA PLANTED, AND YIELD  
OF CORN IN THAILAND, (1967-1976)

Year	Estimated output (1000 tons)	Estimated acreage (1000 rai)	Estimated yield (kg/rai)
1967	1,062.32	3,633.12	354.17
1968	1,135.95	3,877.30	366.43
1969	1,209.58	4,121.48	378.69
1970	1,283.21	4,365.66	390.95
1971	1,356.84	4,555.84	403.21
1972	1,430.46	4,854.02	415.47
1973	1,504.10	5,098.20	427.73
1974	1,577.73	5,342.38	439.99
1975	1,651.36	5,586.56	452.25
1976	1,724.99	5,830.74	464.51



The monthly wholesale prices of corn in Thailand between 1950 and 1969 are shown in Table 16 and a seasonal index on the basis of these data have been estimated and included in Chart 3 which presents the seasonal index and the standard deviation.

The following points of interest can be noted from table and chart.

1. The wholesale price of corn increases steadily from January to mid-April because during these months the quantity of corn flowing from the farm is almost negligible.

2. Between May and September the wholesale price of corn showed a decline because during these months, Thailand has two crops of corn and for the reason explained in Chapter IV (the problem of storage), that farmers brought the whole produce of corn to the market. The demand for corn during this period does not usually increase neither in domestic market nor in the external market. The wholesale price of corn, therefore continued to decline until the market had excess of supply over demand.

3. From October to December, the wholesale corn price showed an upward trend. This trend continues beyond December as well.

The seasonality in the wholesale corn prices thus can be viewed in two phases. The period of declining prices and that of rising prices. The phase of higher prices (October - May) reflects the inclusion of storage and other overhead costs incurred by the middleman to stabilize the supply over the



whole year. The discrepancy between demand and supply during the different months of the year results in seasonal variations in the wholesale corn price.



Table 16

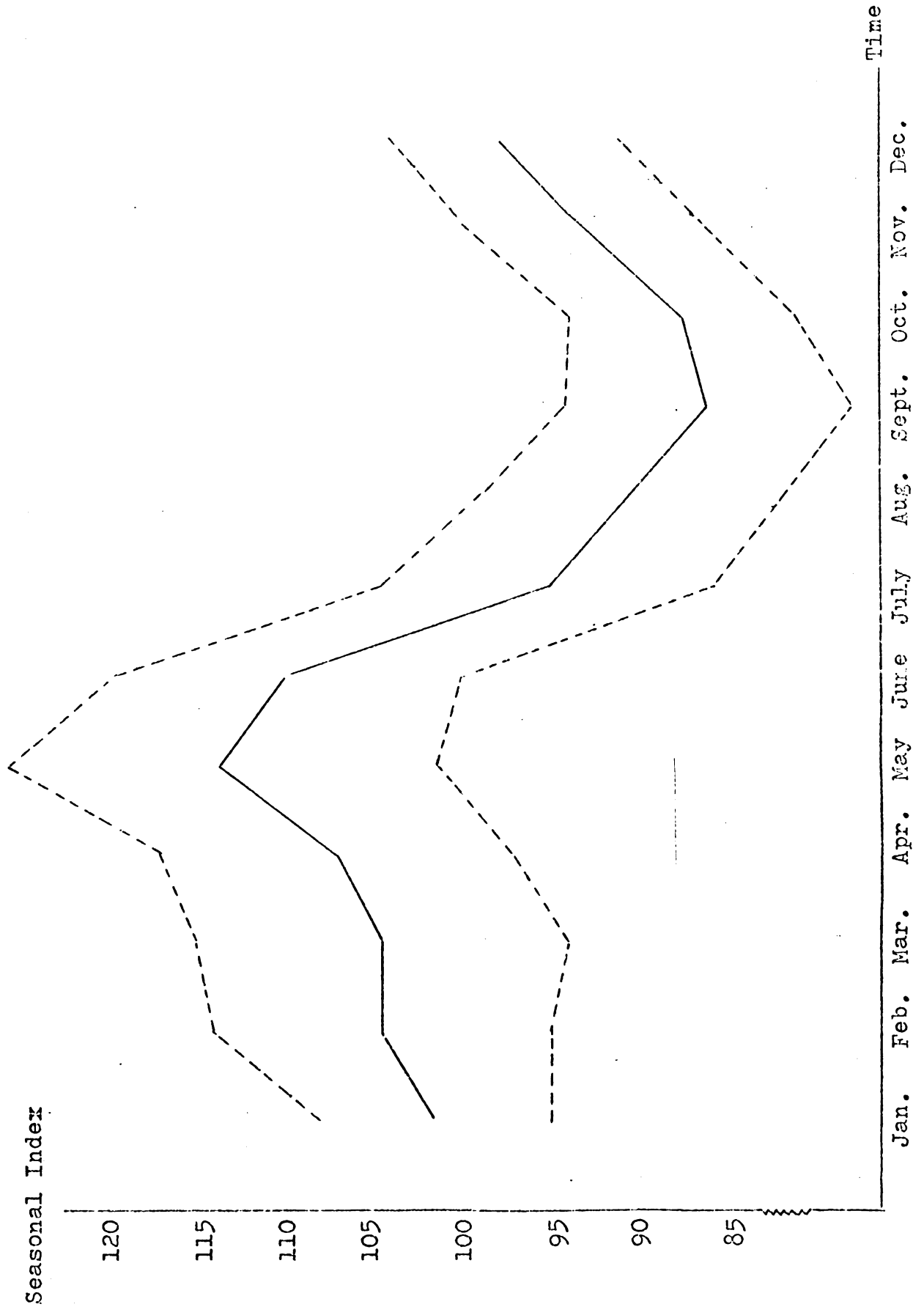
SEASONAL INDEX OF WHOLESALE COFF PRICES IN THAILAND, 1950-1965  
(baht/50 kg)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1950	65.00	72.50	71.50	79.00	85.00	46.00	46.00	50.00	42.50	51.50	62.50	67.50
1951	82.50	96.00	95.00	92.50	95.00	80.00	60.00	65.00	65.00	70.00	75.00	76.00
1952	81.00	90.00	90.00	102.50	85.00	70.00	70.00	71.00	65.00	60.00	62.50	60.00
1953	57.50	57.00	55.00	50.00	47.00	63.50	56.00	56.00	55.00	62.50	62.50	60.00
1954	66.50	75.00	76.00	87.50	110.00	92.50	65.00	59.50	60.00	59.50	65.00	60.00
1955	80.00	82.50	77.00	80.50	82.50	76.00	63.00	56.00	57.00	60.00	59.00	60.00
1956	63.00	67.50	63.50	67.50	76.00	72.50	61.00	57.00	53.00	52.50	54.00	60.50
1957	61.25	60.50	61.25	63.00	67.90	73.25	59.25	55.20	50.87	47.70	49.00	53.62
1958	50.50	54.50	59.00	61.00	73.00	75.00	63.17	64.75	58.83	56.73	58.78	62.50
1959	62.10	64.50	64.61	63.70	69.24	66.12	55.19	50.97	50.71	52.31	61.99	61.45
1960	56.43	59.81	60.72	63.94	69.81	69.25	61.45	59.61	56.18	55.82	57.51	61.54
1961	69.60	68.05	72.98	79.00	76.65	76.00	63.75	55.70	51.86	55.20	57.00	69.24
1962	65.77	68.42	65.45	61.70	67.06	61.65	56.00	54.31	56.00	55.00	54.22	54.57
1963	64.66	67.21	62.79	61.68	67.93	67.15	66.19	65.40	56.82	53.42	66.74	62.20
1964	62.03	56.47	53.39	60.60	65.85	68.93	65.76	64.00	59.77	60.12	62.77	60.05
1965	74.70	82.62	98.93	82.35	92.89	90.63	71.47	59.81	57.16	58.50	67.48	75.15
1966	72.37	70.95	67.95	66.50	69.35	63.35	63.83	63.10	67.16	65.40	67.00	75.00
1967	70.80	67.82	68.87	75.95	81.10	78.83	77.90	68.70	62.75	63.05	67.65	62.00
1968	59.15	58.45	60.88	64.10	63.82	62.83	59.50	55.65	51.05	50.40	57.65	64.00
1969	69.60	69.50	66.80	68.00	73.75	81.25	67.00	59.60	58.40	59.50	65.75	66.15
Seas. Index Stand. Dev.	102.1 6.4	105.0 9.5	105.0 10.4	107.4 9.9	114.0 12.6	111.2 9.6	95.4 9.2	91.1 8.2	86.6 7.8	88.0 6.1	93.4 6.3	98.1 6.6

Source: Ministry of Economic Affairs, Bangkok, Thailand, 1970.



Graph 2  
SEASONAL INDEX OF WHOLESALE CORN PRICES IN THAILAND





## CHAPTER IV

### MARKETING SYSTEMS FOR CORN

The principal feature in marketing of corn in Thailand is that the external demand absorbs almost the whole of the corn production. In 1959-60, 90 percent of the corn produced in Thailand was exported, but the corresponding ratio for 1968-1969 increased to 98 percent. Unlike the other developing nations, corn is not used in human consumption in Thailand as a staple food and the residual amount is used as a feed grain. In 1959-1960, 10 percent of the corn output was used for cattle feeding but it declined approximately to 2 percent in 1968-1969. As has been indicated earlier, the production of corn during this period has increased more than 2 times, whereas demand for corn feed grain has shown a very small increase.<sup>1</sup> But the sharp increase in output has facilitated not only the fulfillment of the local demand for corn as feed grain, but also the demand for export. As these figures reveal, the export of corn has increased about three times over this period (Table 6).

The above discussion suggests that over this period, the importance of the exporter in the disposal of corn has

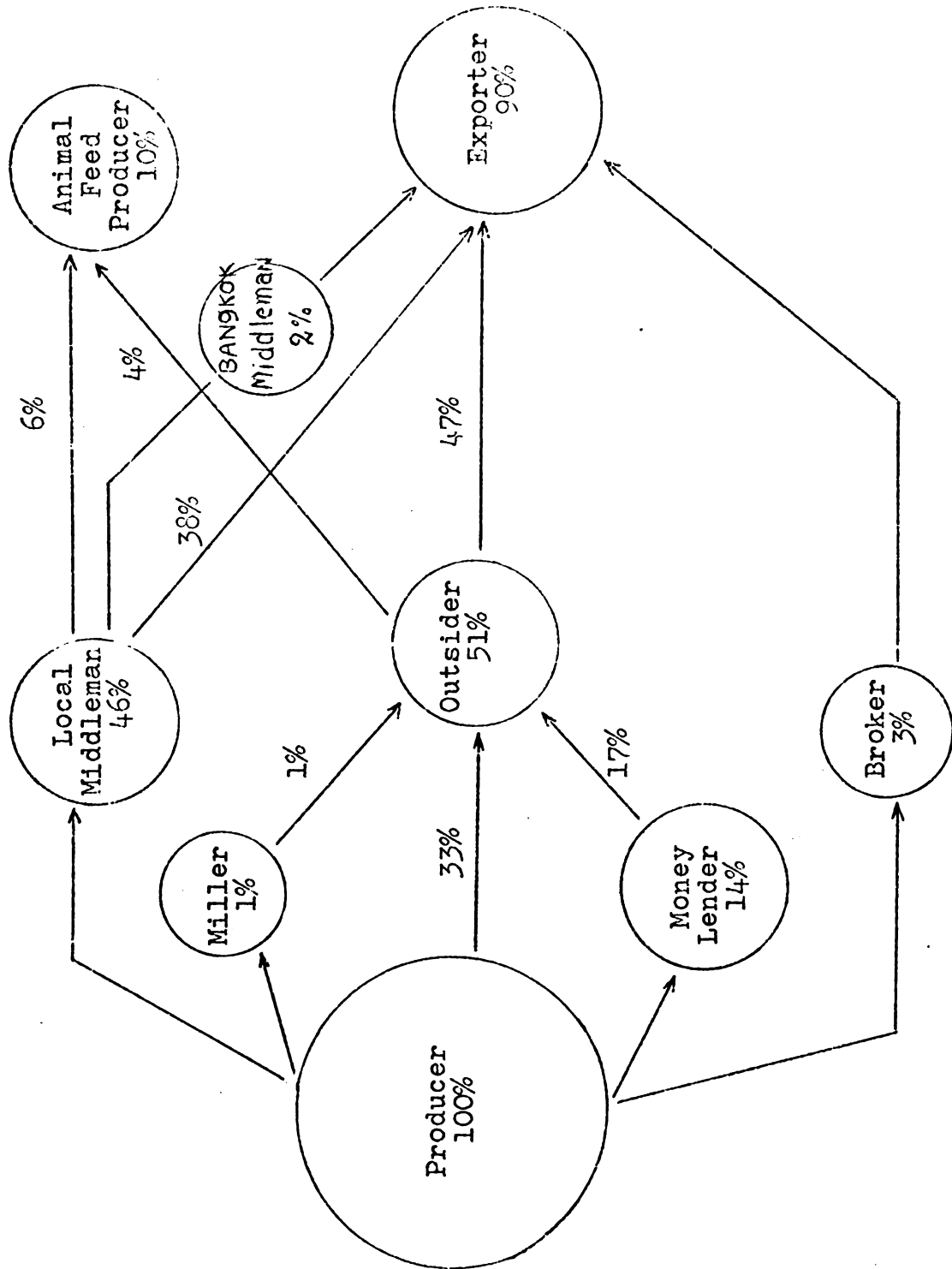
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<sup>1</sup>Division of Agricultural Economics, Ministry of Agriculture, Bangkok, Thailand.



Chart 1

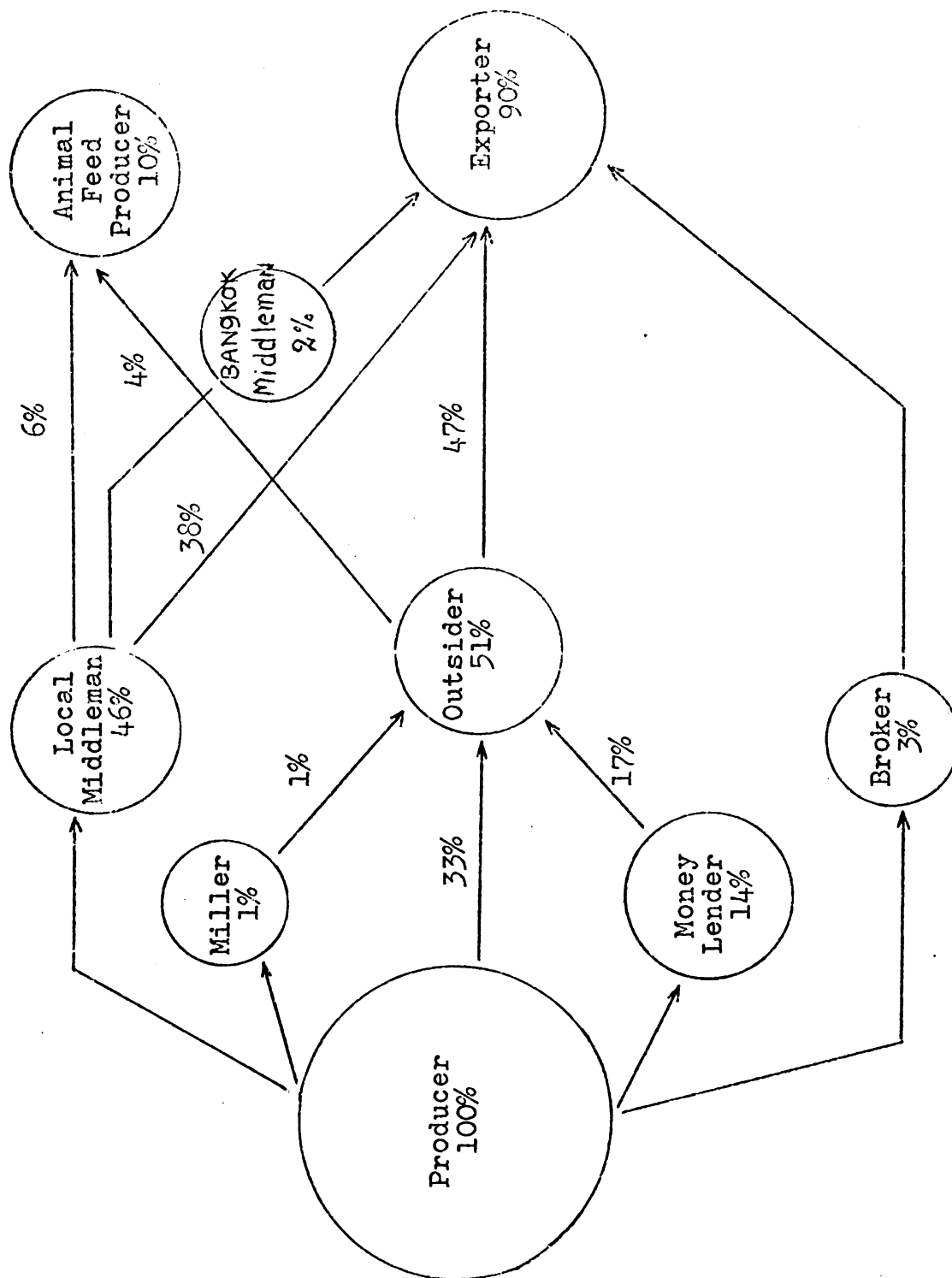
## MARKETING CHANNELS OF CORN IN 1959-1960



Source: Economic problems of production and marketing which affect production extension of corn in Thailand, Kasetsart University, Bangkok, Thailand, Report No. 18, 1963.



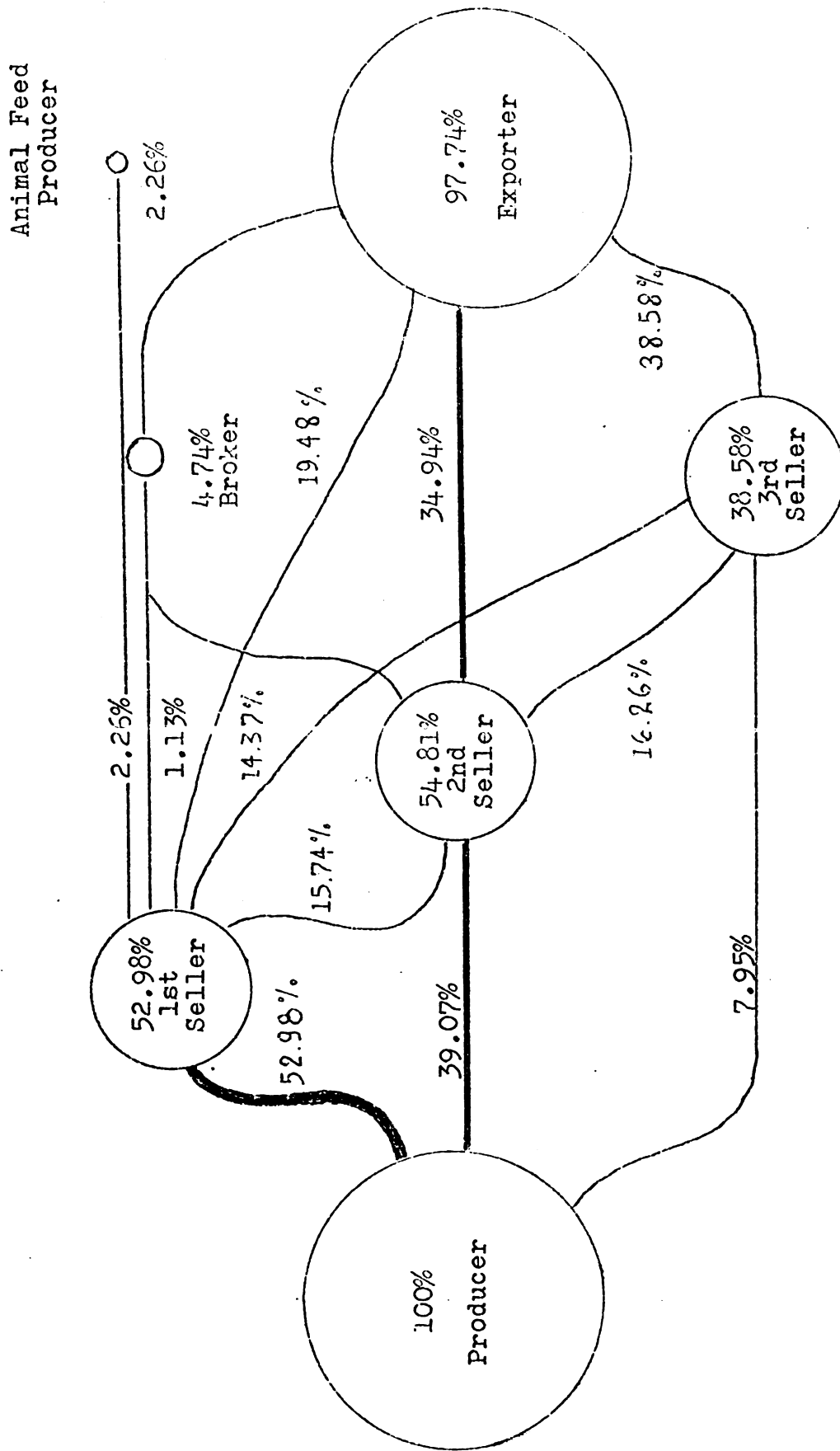
Chart 1  
MARKETING CHANNELS OF CORN IN 1959-1960



Source: Economic problems of production and marketing which affect production extension of corn in Thailand, Kasettsart University, Bangkok, Thailand, Report No. 18, 1963.



MARKETING CHANNELS OF CORN IN 8 CHANGWADS IN CENTRAL  
REGION OF THAILAND: JUNE 1968-May 1969



Source: Annual Report 1969, Project No. 10, Kasetsart University, Bangkok, Thailand



enormously increased. This has led to certain structural changes in the marketing channels for corn.

Chart 1 explains the relative position of various agencies in the disposal of corn in 1959-1960 while the corresponding arrangements of different marketing agencies in 1968-1969 have been presented in Chart 2. In 1959-1960, local middlemen accounted for 46 percent of the total corn produced by the farmer. The outside middleman purchased one-third of the output directly from the farmer. He also procured 17 percent of the produce following from the farmer to the money lender and one percent of that going to the millers. The farmer sold three percent of the produce to the brokers who worked for the exporters. In other words, exporters also purchased corn from the farmers, but they have to use the service of the brokers in this process.

By 1968-1969, the situation had changed considerably. There are now three principal agencies working between the farmers and the exporters, namely, the first seller, the second seller and the third seller. The first seller is the local buyer who has a direct contact with the farmer and buys about 53 percent of the better produce, but would then sell to the second seller, to the exporter, to the broker and also to the cattle-feeder. As Chart 5 reveals, by 1968-1969, the local middleman (now known as first seller) had lost much of his direct contact with the exporter as compared to 1959-1960, and currently less than 20 percent of the produce goes directly from the first seller to the exporter.



As compared to 1959-1960, a relatively new but stronger agency seems to have emerged in the process of corn marketing in Thailand. The third seller or commonly known as Changwad (province) seller has more financial power and can work on a larger scale. Even though his direct purchases of corn from the farmer constitute a very small fraction of the total corn production, he buys corn from the second and first sellers. In short, about 40 percent of the corn which is exported passes through the third seller.

Two other important changes have taken place in the marketing process for corn over the 1959-1969 period. First, the brokers working for the exporters have lost their direct contact with the farmer and now they buy either from the first or second seller. Secondly, money-lenders have lost their distinctive role in procuring corn from the farmers while in 1959-1960 farmers sold 17 percent of their produce to the money-lender against the principal and interest payment. In 1968-1969 this type of obligation on the part of the farmer is not found. However, it appears that most of the money-lenders have turned into middlemen and are buying corn from the farmers in this capacity. Many of the local as well as outside middlemen advance loans to the farmers with an understanding that they (farmers) would sell their produce to these traders immediately after the harvest. About 63 percent of the traders give credit to the farmers.<sup>2</sup>

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<sup>2</sup>Dr. Chaoyong Chuchart and others, Production and Marketing of Corn in Thailand, Kasetsart University, Bangkok, Thailand, 1963, p. 42.



Change in Marketing Margin:

Though during the last decade, the marketing channel for corn in Thailand has undergone certain basic changes, the marketing margin has declined over this period. The following table presents an account of the average price received by the farmer, the export price f.o.b. Bangkok and the marketing margin for 1959-1960 and 1968-1969.

Table 17

PRICE RECEIVED AT THE FARM FOR CORN AND EXPORT PRICE,  
F.O.B. BANGKOK, 1959-1960 AND 1968-1969

Year	Price received by the farmer (baht/60kgs)	Export price f.o.b. Bangkok (baht/60kgs).	Marketing margin (baht/60kgs)	Percentage of market- ing margin (col. 3 as % of col. 2)
1959-60	44.23	71.18	26.95	37.8
1968-69	45.59	65.75	20.16	30.6

Source: Computed from data shown in Table 18 and Table 19.

As indicated in the above table, even though the export price, f.o.b. Bangkok, has declined by 5.4 percent, the price received by the farmer has increased by 1.3 percent. Despite the fact that a new channel, i.e., the third seller has emerged as an important marketing agency, the marketing margin has decreased from 37.8 percent to 30.6 percent.

Tables 18 and 19 indicate that as compared to 1959-1960 the transportation costs in 1968-1969 were considerably lower



(by 21 percent). Similarly the profits of the outside and local middlemen have also decreased during this period. It appears that with an increase in the number of middlemen and with increasing competition among them, the share of the farmer has gone up.

Yet, the profits of the exporter and the wholesaler appear to be high. In 1968-1969 for example, the profit of the exporter accounted for 11.3 percent of the export price, f.o.b. Bangkok. In addition, about nine percent profit was obtained by the wholesalers and other middlemen. Even if other costs are allowed, the broker fee, transportation, wages, taxes, etc., the profit of the middleman appears to be exorbitant.

On the basis of certain data published by the Kasetsart University for the monthly corn prices received by the farmer, by the provincial dealer and the wholesale price in Bangkok for the year 1968-1969 it can also be shown that the marketing margin appears to be high. The data on prices received by the farmers and provincial dealers pertain to five changwads in the central region and therefore may not be fully comparable with the figures given in Tables 17, 18 and 19.



Table 18

MARKETING COST, PROFIT OF DEALERS AND PERCENTAGE OF MONEY  
RECEIVED BY EXPORTERS FOR CORN OBTAINED FROM FARMERS  
AND DEALERS IN 8 PROVINCES IN CENTRAL REGION, THAILAND, 1960

Cost and Profit	Amount of Money (baht/60 kgs)	Percent
Corn price (f.o.b. Bangkok) per year obtained by exporter	71.18	100
Average obtained by farmer	44.23	62
<u>Cost</u>	8.80	
Cost of outsider middleman	6.80	10
Transportation cost	2.00	3
<u>Profit</u>	18.15	
Profit of outside middleman (Profit before depreciation and interest charges are deducted)	4.48	6
a) capital	1.93	3
b) expenditure for exporter	9.60	13
c) profit for exporter	2.14	3

Source: Dr. Chaiyong Chuchart and others, Production and Marketing of Corn in Thailand, Kasetsart University, Bangkok, Thailand, 1963, p. 177.



Table 19

MARKETING COST, PROFIT OF DEALERS AND PERCENTAGE OF  
MONEY RECEIVED BY EXPORTERS FOR CORN OBTAINED FROM FARMERS  
AND DEALERS IN 8 PROVINCES IN CENTRAL REGION,  
THAILAND, (JUNE 1968-May 1969)

Cost and Profit	Amount of Money (baht/60 kgs)	Percent
Average export price (f.o.b. Bangkok) per year obtained by exporter	65.75	100.00
Average obtained by farmer	45.59	69.34
<u>Cost</u>	6.88	
Transportation	1.58	2.40
Brokers	0.93	1.41
Wages	1.36	2.07
Tam and fees	0.03	0.05
Container cost	2.08	3.16
Office cost (rent, service, etc.)	0.37	0.56
Others	0.53	0.81
<u>Profit</u>	13.28	
Net profit of wholesalers	5.86	8.91
Total profit of exporter	7.42	11.29

Source: Kasetsart University, Bangkok, Thailand, 1970.



The following points can be noted from Table 20:

1. The margin between the price received by the farmer and that received by the local merchant varies between 8.3 baht per 60 kgs. in October and 13.5 baht per 60 kgs. in July. During other months the margin varies according to the availability of corn. However, the two prices show a considerable degree of correlation, that is, the price received by the provincial dealer is followed by the price received by the farmer.

2. The wholesale price of corn in Bangkok shows wider fluctuations during the year than do the prices received by the provincial dealer. Put in terms of concurrent deviation, prices shown in column two and three show a high degree of correlation.

The f.o.b. Bangkok export prices also follow the changes taking place in the wholesale prices in Bangkok but the exporter has to buy corn at a loss in the months of May, November and December when the farmer has no corn to offer, and he has to depend only on other middlemen (see Table 20). The margin between the Bangkok wholesale price and export price, f.o.b. Bangkok, is very low in the month of November presumably because of the lower world corn prices, but in the preceeding month because of lower internal prices the margin is considerably higher. The exporters have to buy corn from the wholesaler at a price lower than they receive in May and December.

No definite conclusions can be reached with respect to



to these price movements and the marketing margins. It can be only concluded that the margin between the export f.o.b. Bangkok price and price received by the farmer is a function of world corn prices, flow of the corn from the farm to the trader and the quantity of corn stored by the wholesalers.



Table 20

PRICES RECEIVED BY FARMERS, BY PROVINCIAL DEALERS AND  
 LOCAL MERCHANTS, WHOLESALE PRICES IN BANGKOK AND  
 EXPORT PRICES, F.O.B. BANGKOK, CORN, BY MONTHS, 1968-1969  
 (baht per 60 kgs)

Month	Price received by the farmer	Price received by the provincial dealer and local merchant	Wholesale corn price in Bangkok	Export price f.o.b. Bangkok
June	45.00	58.00	60.00	67.61
July	39.84	53.33	57.00	66.66
August	41.04	52.17	55.20	62.97
September	41.42	51.49	50.40	61.62
October	44.18	52.45	50.40	58.60
November	47.42	57.34	56.40	56.41
December	49.70	59.86	61.80	59.41
January	51.15	60.97	69.00	65.77
February	50.60	52.90	67.80	71.81
March	52.40	61.50	69.60	74.91
April	-	65.00	66.50	74.85
May	-	65.00	72.00	68.27

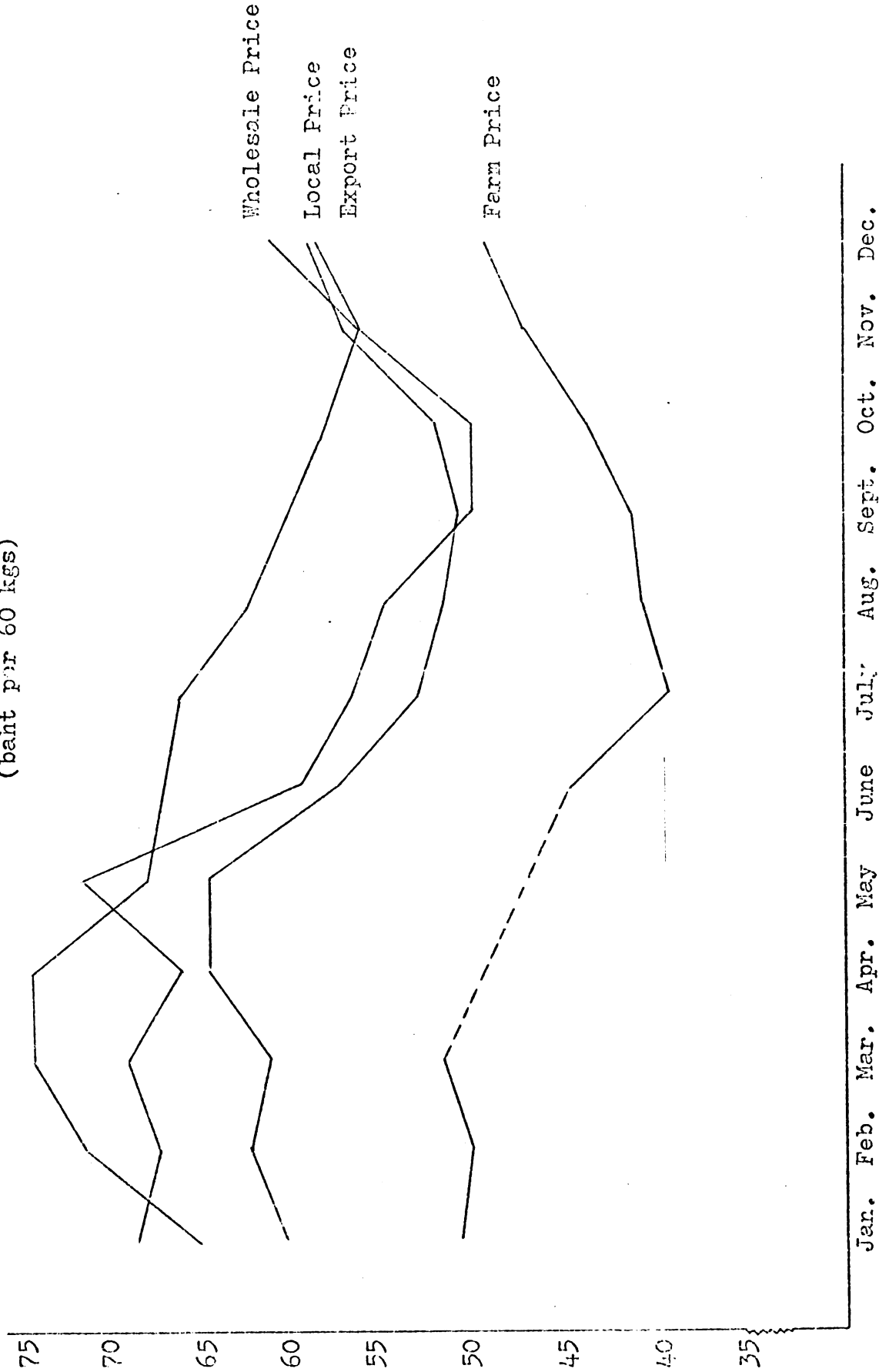
Source: Column 1, 2, 3, Division of Agricultural Economics,  
 Ministry of Agriculture, Bangkok, Thailand, March 1970.

Column 4, Division of Customs, Ministry of Economic  
 Affairs, Bangkok, Thailand.



Graph 3

PRICES RECEIVED BY FARMERS, BY PROVINCIAL DEALERS AND LOCAL MERCHANTS  
WHOLESALE PRICES IN BANGKOK AND EXPORT PRICES F.O.B. BANGKOK, CORN, BY MONTHS, 1968-69  
(baht per 60 kgs)





Overall Transportation Condition:

Transportation plays a vital role in national development, particularly in the process of integrating rural and urban sectors. The flow of agricultural products from the village to the marketing center, and that of agricultural inputs to the farmers depend largely on the transportation network. Among the principal transportation routes, railroads account for nearly 42 percent of the movement of all types of goods, about one-third of the goods move through waterways and the remaining goods move through the highways.<sup>3</sup>

Road maintenance in Thailand is generally poor and during the rainy season large sections are impassable because of floods. The drainage is poor and construction is defective in most parts of the country. In 1965, out of 7,800 miles of road only one third were suitable for all weather travel and movement of cargo.<sup>4</sup>

This is true despite the fact that during the last two decades the government has made some effort to improve the roads especially under the seven years Provincial Highway Development Program (1964-1970). Some new roads have been built and some roads have been paved but most of this improvement remains confined to the urban areas. In 1953, the mean distance between the farm, markets and the highways in different

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<sup>3</sup>J. R. Behrman, Supply Response in Underdeveloped Agriculture, North-Holland Publishing Company, Amsterdam, 1968, p. 51.

<sup>4</sup>H. H. Smith and others, Area and Back for Thailand, Foreign Area Study, The American University, Washington, September 1968.



regions varied between 6 and 15 kilometers (see Table 21). As Table 21 reveals, the average distance between the village and highway in Thailand was 10 kilometers.

Table 21

MEAN DISTANCE IN KILOMETERS<sup>1</sup> OF FARMS FROM  
MARKET AND TRANSPORT FACILITIES  
ACCORDING TO 1953 FARM SURVEY, THAILAND

Region	Mean Distance in Kilometers From			
	Market Town	Waterway	Highway	Railroad Station
Central Region, excluding southeast coast	6.0	11.1	5.8	17.4
Southeast Coast	5.8	3.1	5.6	180.2
Northeast	12.6	7.1	14.7	84.3
All Thailand	9.0	3.1	10.2	71.7

<sup>1</sup>A kilometer is equal to five-eighths miles.

Source: J. R. Behrman, Supply Response in Underdeveloped Agriculture, North-Holland Publishing Company, Amsterdam, 1968, p. 54.

Moreover, most of these roads could be used only during the dry season. Since 1953, not much has been done to improve this situation.

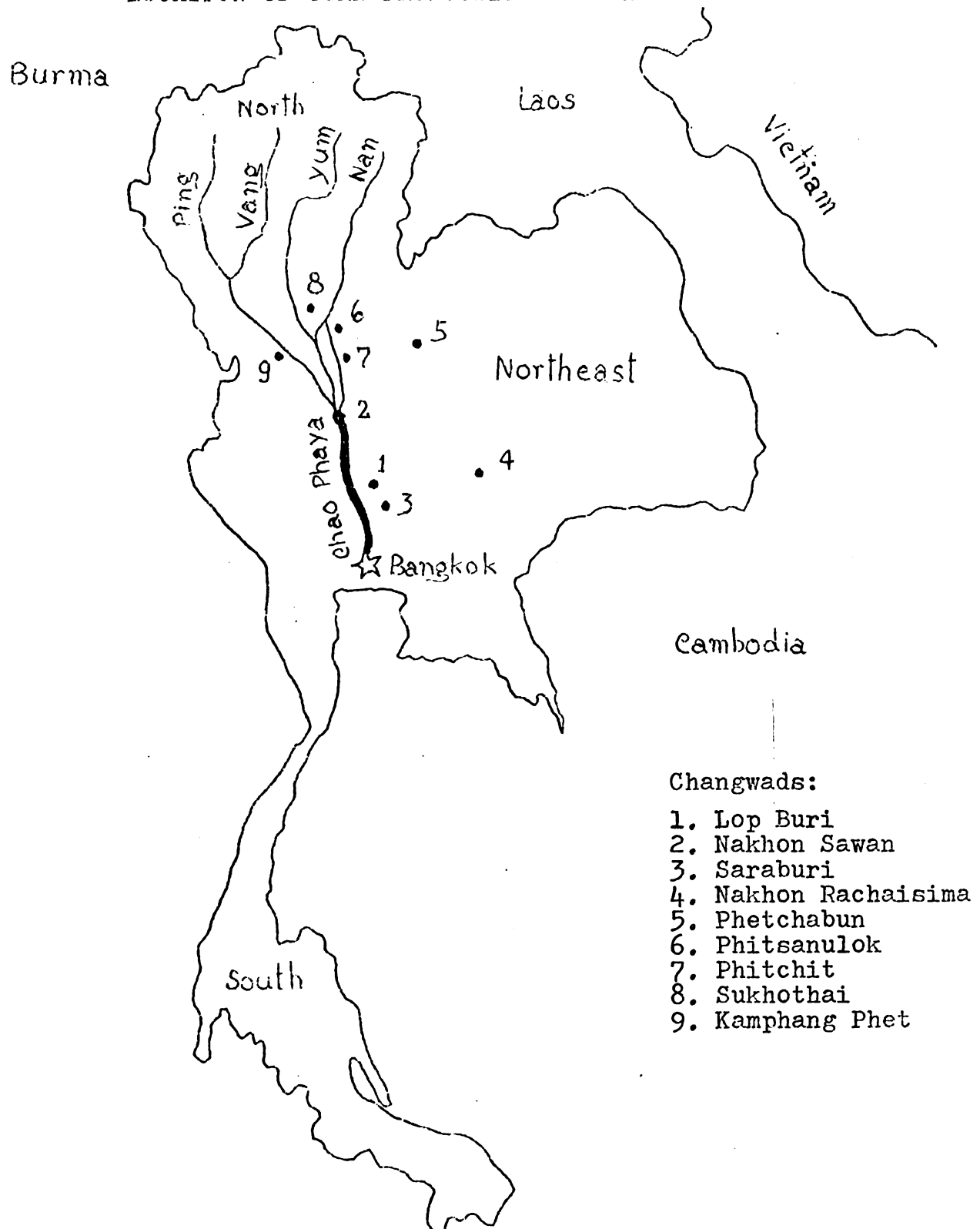
#### Waterways:

As has been stated above, one-third of the goods in Thailand are carried through waterways. Waterways are more popular in the Chao Phaya low land, north of Bangkok where



Map 2

## LOCATION OF CORN PRODUCTION AREA IN THAILAND



Source: Drawn from the information contained in Fact and Figure of Thailand, Ministry of National Development, Bangkok, Thailand, 1965.



they constitute an interconnected network of the work canal and branch systems. For the movement of agricultural products, waterways are most commonly used with respect to rice. However, only Nakhon Sawan is in a favorable position to make a good use of waterways for the transportation of corn. As can be seen on Map 2, Nakhon Rachasima and Petchabun have no direct access to any river. On the other hand Phitsanulok, Phitchit, Sukhothai and Kamphang Phet have small rivers which are not navigable during most part of the year because the four rivers, Ping, Vang, Yum and Nahn are rain-fed rivers and become shallow during the period when corn needs to be transported. For this reason waterways are not popular for the transportation of corn.

#### Railroads:

The railroad system in Thailand is also not very well developed. In 1966, the total mileage of railroads was less than 2,300, and all lines were single track except a 56-mile double track stretch around Bangkok.<sup>5</sup> Most of the railroads link the big cities or towns and as Table 21 indicates the average distance of the village to the railroad station is about 72 kilometers which means the farmer is not in a position to use railroads for transporting his produce.

The transport system therefore is not favorable to the farmer, especially for corn. The only important route accessible to the farmer is the road. As has been pointed out

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<sup>5</sup>H. H. Smith, op. cit., p. 54.



earlier, most of the roads are only fair-weather roads, and therefore, most of the corn is shipped from the village to the market in bullock-carts during the dry season. The cost of transportation is high and involves a great deal of time. It appears that corn was not considered an important product, hence the neglect in the improvement of its transportation. It would appear that the transport facilities for corn need to improve in the future if its potential importance as an export crop is to be realized.

#### Storage:

Since most of the small producers work on a small scale and since corn is not used for consumption, the whole of the output is sold to the middleman immediately after the harvest. A small amount of corn is sold to dairy farms, swine farms and poultry farms. Up till now no serious thought has been given to the question of storing the corn. Since farmers do not have storage facilities, they are compelled to sell their produce immediately after the harvest. It appears that the large fluctuations in the price of corn shown in Graph 3 and Table 16 (Chapter III), are due to heavy arrival of corn in the market during the post-harvest month.

The small quantity which is produced by the small farmer precludes any effort on his part to build warehouses at the farm level. The local and the outside middleman also seem to have no inducement to store the corn because of the pressure of demand from exporting firms. Since more than 90 percent of the corn is exported, the whole stock of corn is brought to



Bangkok where the exporting firms keep it in their warehouses. To sum up, it can be stated that the storage of corn is done only by the exporter and the farmers and middlemen have practically no storage facilities.

During the last 12-15 years farmer cooperatives have built some storage barns at the village level to facilitate the storage of agricultural products at the farm level. But these storage barns are very few in numbers, their capacity is very small and they do not have any scientific way to preserve the quality of the produce.

#### Credit:

The greatest need for credit to the farmer is at the time of growing and harvesting the crops. Most farmers do not have adequate savings and therefore have to depend on money lenders and/or the middleman. Usually the local as well as the outside middleman finance the farming operations with a tacit understanding that the farmer will sell their produce to them. Even though from 42 to 52 percent of the loans (in different regions of the country) are taken for family living, weddings or funeral services, the farmers are obliged to sell their produce to the money-lender cum-middleman.<sup>6</sup>

The following table gives an account of the various sources of credit in the four important regions in Thailand and their relative importance. As the above table indicates,

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<sup>6</sup>Pantum Thiayamondol and others, Agriculture Credit in Thailand, Kasetsart University, Bangkok, Thailand, 1965, pp. 22-23.



local stores and crop buyers provide about 22 percent of the credit in the Central regions which is the corn-producing area. In other regions, however, farmers rely more heavily on their relatives. About 63 percent of the traders in the Central region advance loans to the corn producer.<sup>7</sup> However, the fact remains that they are obliged morally, or otherwise to market their produce to the middleman. The cooperative and other institutions are still in the initial stages and do not help the farmers in obtaining credit on fair and reasonable terms.

The monthly rate of interest varies between 1.8 percent and 3.5 percent for the individual's source, though the institutional sources (such as government, cooperatives and banks) provide loans at 0.8 percent.<sup>8</sup>

The very fact that 53 percent of the corn is sold by the farmers to local middlemen and 39 percent to the outside middlemen (figures relate to 1968-69) gives an indication that in the marketing of corn, farmers are under the pressure of the middleman who provide loans to them in cash as well as in kind.

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<sup>7</sup>Dr. Chaoyong Chuchart and others, op. cit., p. 142.

<sup>8</sup>Dr. Chaoyong Chuchart, op. cit., pp. 39-40.



Table 22

SOURCE OF CREDIT BY REGION IN THAILAND  
(in percentage of total)

Source of Credit	Central Plain	North	Northeast	South
Relative	22.6	47.0	58.5	43.0
Neighbor	16.7	19.9	4.3	12.7
Local Store	13.9	3.0	4.6	10.9
Crop Buyer	7.9	10.1	6.5	13.8
Landlord	10.7	0	5.2	0
Money Lender	14.2	8.9	7.5	1.5
Institutional Lenders (Gov't, Coop, & Bank)	3.0	9.8	10.8	13.7
Others	11.0	1.3	2.6	40.4
Total	100.0	100.0	100.0	100.0

Source: Pantum Thidyamondol and others, Agricultural Credit in Thailand, Kasetsart University, Bangkok, Thailand, p. 37.



Table 23

MONTHLY INTEREST RATES BY REGION IN THAILAND  
AND TYPE OF LENDER

Type of Lender	Region				Mean for All Areas
	Central Plain	North	Northeast	South	
Relative	1.7	2.6	1.8	1.1	1.8
Neighbor	2.4	3.3	3.3	2.3	2.6
Commercial Lender	2.3	4.8	4.3	2.0	2.9
Local Store	2.7	5.4	6.2	2.7	3.5
Crop Buyer	2.4	4.7	3.9	1.3	2.9
Landlord	3.8	N.A.	1.8	N.A.	3.5
Money Lender	2.1	5.0	7.3	3.6	3.3
Other	1.6	3.4	7.0	2.2	2.5
Institutional Lender	0.8	0.8	0.8	0.8	0.8
Credit Coop.	0.8	0.8	0.8		0.8
Other Gov't. Agency	0.8	0.8	0.8		0.8
Commercial Bank	N.A.	N.A.	N.A.	N.A.	-
Weighted Average Rate	2.2	3.3	2.7	1.5	2.4

N.A. - Not available.

Source: Pantum Thidyamondol and others, Agricultural Credit in Thailand, Kasetsart University, Bangkok, Thailand, p. 40.



## CHAPTER V

### SUMMARY, IMPLICATIONS AND SUGGESTIONS FOR CHANGING THE MARKETING STRUCTURE AND POLICY

The previous chapters have focused on the trends in production, acreage, yield, prices, exports, and the marketing system of corn. Some of the implications of the foregoing analysis follow:

1. Over the last 16 years, corn production and yield have recorded substantial increases. The yield of corn, however, is still low as compared to other principal corn producing nations. Since corn is primarily an export crop, this has far reaching implications for the export price and demand in the future.

2. Production of corn in Thailand is centralized in the central region because of the soil and other physical conditions. This suggests that the supply of corn depends on the weather and other exogeneous factors mostly beyond the control of man. In short, the corn producing sector in Thailand suffers from all the drawbacks of a localized industry.

3. The wholesale price of corn fluctuates over the different months in a year, but as has been explained in Chapter II, the seasonal price index shows two phases of price movement, an upward movement, (October-May) and a declining



trend, (mid May--September). This explains the lack of stability in the supply of corn during different months in a year--stemming mainly from lack of storage facilities at the farm level.

4. The price fluctuations are also the result of an inadequate transport system in the countryside. Lack of good feeder roads and inaccessibility of the farmer to main street and the highway is another major factor explaining the instability of the prices.

5. The marketing channels for corn are undergoing basic changes, yet the marketing margin has declined due to improvement in the system. Still, the share of the farmer in the wholesale price or the f.o.b. Bangkok export price of corn is only 69 percent. Moreover, the export prices do not follow the trend in the wholesale price in Bangkok or the price received by the provincial dealer, (Graph 4). In certain months, (September-December), the export prices stay below the level of prices received by the provincial dealers because during these months the exporter has to buy corn from other channels at the going price in order to fulfill his export agreement. Obviously, during the above months, the provincial dealer and wholesaler would prefer to charge high prices for corn.

6. The margin between f.o.b. Bangkok export price and Bangkok wholesale price of corn is low in certain months, while very high in others, depending on the demand for exporting corn.



7. The fact that institutional credit is not adequate in Thailand, provides some explanation of the high cost of credit with the rate of interest varying from 0.8 to 3.5 percent per month, coupled with an obligation for the farmer to sell his produce to the lender.

8. Little effort has been made to measure the demand for corn in the domestic market, especially for cattle feeding. The residual nature of such demand has an implication of unstable supply in the domestic market and the resulting variations in the price.

9. Since corn is mainly an export crop, any unusual gap between the f.o.b. Bangkok export price and the domestic price of corn is likely to have serious implications for the quantity of corn exported. Whether or not the contract for export is fulfilled by the exporter will depend on the difference between the two prices. Whenever the wholesale price in Bangkok of the provincial prices of corn are higher than the f.o.b. Bangkok (export) price, the exporters do not hesitate to go back on their export commitments, on the other hand, when prices within the country are lower than the f.o.b. Bangkok export price, they try to persuade importers abroad to buy larger quantities.

10. Thai corn exporters depend very heavily on Japan for the export of corn, albeit the Thai proportion of Japanese corn imports is declining. There has been very little effort on the part of the exporters to search for new markets.



11. There has been very little effort to diversify the use of corn in the domestic market. The emphasis so far has been on exporting the grain, rather than the processed corn or canned meat which could be obtained by expanding the cattle feeding industry. In short, no effort has been made to increase the use of corn at home and increase the export of corn-based products. The world demand for Thai corn may not be significant in the future due to the high cost of corn production and rising competition in the world market.

#### Recommendations:

It seems appropriate to assume that the corn producing sector will continue to occupy an important place in Thai agriculture, and that the export of corn and corn-based products (meat, corn oil and processed corn) will remain important in the future. Therefore, it is desirable to introduce certain changes in the system to improve its performance. The following suggestions can be made to change the structure of the corn producing sector and to increase its efficiency:

##### 1. Intensive Cultivation of Corn:

All efforts should be made to increase the yield of corn in Thailand by providing better inputs such as improved seed and fertilizers. The Guatemala variety has increased the yield substantially, still there is enough room for improvement. Hybrid varieties of corn should be developed, and be made available to farmers in adequate quantity. Research stations and demonstration farms to this effect should be set up in order



to develop high yielding varieties, (H.Y.V.) of corn.

Further improvement in yield of corn appears to be a precondition for maintaining a competitive position for Thai corn in the international market. Besides establishing a research and experiment station for the H.Y.V., simultaneous efforts should also be made to increase the supply of fertilizers and better plows. This will require extensive credit programs for the corn producing sector. The intensive cultivation program should, therefore, include better and more intensive cultivation of land.

2. Experiments for growing corn in the changwads outside the central region should be established. New varieties may be developed for these changwads that have relatively less favorable physical condition for corn production. This will help in increasing an aggregate output of corn in Thailand.

3. For the stabilization of corn prices, a comprehensive storage program should be suggested both at the farm level as well as in the provincial markets. A warehousing program on a large scale can be undertaken either by the government or by the government-sponsored farm cooperatives. The farmers may be allowed to keep their produce in these warehouses during the loan months, (May-September) against a nominal payment on warehousing cost. The storage program should be given high priority in the next five year plans. It might be pointed out in this context that a large scale storage program can be completed only over the long run.



4. Development of feeder roads and an improved transport system is also urgently needed for improving the efficiency of the corn producing sector. These will be complementary to the warehousing program and will presumably help in the stabilization of prices. Very little progress has been made in the direction of developing feeder roads in the countryside and making the provincial highways workable for year around use. It seems that the seven year national highway construction and rehabilitation program (1965-1971) is biased toward national highways and little thought has been given to the development of roads in the countryside. During the Second Plan, (1967-1971) out of 7.3<sup>1</sup> billion baht envisaged, 6 billion baht have been allocated for the development of national highways.<sup>2</sup> It can therefore be suggested that in the next Five Year Plan 40 to 50 percent of the transportation outlay be devoted to provincial highways including the feeder roads.

The warehousing program coupled with the plan for developing provincial highways will bring forth further improvement in the efficiency of marketing system for corn. It may also be hoped that this will reduce the marketing margin and it is likely to benefit farmers as well as other participants in the system.

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<sup>1</sup>The Second National Economic and Social Development Plan (1967-1971), op. cit., p. 137.

<sup>2</sup>Op. cit., p. 137.



Institutional changes for improving the farm credit structure should also be given serious consideration and still more encouragement is needed for the cooperatives because they can provide cheap credit to the farmer without any strings. In the development plan a subsidized credit program should be included as to enable the farmer to obtain credit at a low cost.

The above proposals are likely to improve the internal conditions of the corn producing sector. However, for improving the foreign trade in corn, the following suggestions can be presented.

a) The marketing of corn in the external as well as in the domestic market can be improved by introducing grading and standardization for corn. The ministry of agriculture should appoint the necessary personnel to grade the various categories of corn on the basis of norms set by the government. It appears that the exportable corn is not subject to strict quality control and this may affect the Thai corn exports in the years to come.

b) Detailed programs should be made for extending corn exports to other countries. Efforts should be made to have trade negotiations with such countries, and unnecessary dependence on Japan and Taiwan should be avoided for the export of corn. The Board of Trade should be made responsible for opening new markets for Thai corn.

c) Long term trade agreements should be made with the importers of Thai corn so that the exporters, the middlemen



and producers of corn can plan their operations in advance. This would insure more stability in the f.o.b. Bangkok export price, would provide a guarantee to the exporter with respect to the quantity to be exported, and would therefore, give an incentive to all other participants in the corn sectors.

d) There should be effect to promote diversification in the use of corn. It seems reasonable to believe that Thailand cannot depend definitely on the export of corn in the grain form. Effort should therefore be made to make an increasing use of corn in the domestic market. A pragmatic approach would be to encourage the cattle feeder industry under the next Economic and Social Development Plan. The emphasis should be shifted from exporting corn to the export of meat. Supplementary industries using corn could be the cereal industry and corn oil industry. Encouragement should be given to the use of breakfast cereals (such as corn flakes) within the country. In the initial stages promotion of these products could be confined to the urban populations but gradually their use might be extended all over the country. The fact that between 1960 and 1966 the per capita GNP in Thailand increased by 30 percent (from 2050 baht to 2628 baht), gives rise to an optimism that the demand for breakfast cereal can be increased with intensive promotional effort.<sup>3</sup>

The marketing channel for corn has shown considerable

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<sup>3</sup>The National Economic and Social Development Plan, op. cit., p. 12.



improvement during the past few years and hopefully will continue to improve, and the share of the farmer in the price received by the wholesaler or exporters will continue to rise.



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