RURAL INSTITUTIONS SERIES No. 1

JCRR

AGRICULTURAL MARKETING IN TAIWAN

TAIPEI, TAIWAN, REPUBLIC OF CHINA
NOVEMBER, 1972

AGRICULTURAL MARKETING IN TAIWAN

—A General Description—

By

Hsing-yiu Chen

Senior Specialist
Farmers' Service Division

Joint Commission on Rural Reconstruction

FOREWORD

Taiwan's agriculture has scored high rates of growth during the postwar years. As a result, now enjoy general stability and prosperity. Many factors have contributed to this achievement. Agricultural marketing is a major one, among others.

This report by Dr. H. Y. Chen is a comprehensive, descriptive material on Taiwan's agricultural marketing, covering almost all facets of the subject. It presents the reader with an overall picture of the agricultural marketing system and how it functions.

The report is rather brief, considering the complexities and problems involved in and posed by Taiwan's agricultural marketing. However, it has achieved the most that can be expected. It is well organized and balanced with adequate coverage of the main theme. It will, I hope, be a cornerstone on which more detailed studies will be constructed.

Y. K. Yang
Chief
Farmers' Service Division

Acknowledgement

I owe a debt of gratitude to Mr. W. F. Chuang, Senior Specialist of the Farmers' Service Division of the Joint Commission on Rural Reconstruction (JCRR), who went over the manuscript of this paper and made valuable comments and suggestions. Many thanks are also due to Miss Alana Lin, and Mr. F. S. Liu of the same Division who assumed the painstaking task of typing the manuscript, and helped with data processing and proofreading.

While I wish to express my sincere appreciation to many others who facilitated the drafting of this paper, I alone am responsible for the interpretation of the materials and presentation of this paper.

H. Y. Chen
Senior Specialist
Farmers Service Division

CONTENTS

LIST OF TABLES

INTRODUCTION—AGRICULTURAL PRODUCTION AND FOOD CONSUMPTION

Geographic Environment

Taiwan, better known as Formosa to Western people, is a small island lying about 100 miles to the east of mainland China. It is situated between 119° 18'E and 122° 6'E longitude and 21° 45'N and 25° 33'N latitude. Stretching about 380 kilometers from north to south and about 140 kilometers from east to west, the tobacco leaf-shaped island covers an area of about 36,000 square kilometers or 14,000 sqnare miles.

With the Tropic of Cancer running across the lower middle part of the island, the climate is subtropical: annual average temperature ranges between 21.7°C and 24.4°C throughout the island. The highest average monthly temperature (July) is 27.2°C to 28.9°C, while the lowest monthly (February) average is between 14-20°C. As Taiwan is situated in the so-called monsoon area, precipitation is abundant, bringing 1,800 to 2,800 mm. average annual rainfall to the important regions of the island, although it is quite unevenly distributed over the year. High temperature and sufficient moisture are important natural factors which make highly intensive use of land possible. The farmers can grow three or even four crops a year including two rice crops.

The Farmers

This small island is presently inhabited by about 14.7 million people of Chinese origin, the majority of whom are the descendants of immigrants from the southern coastal provinces of mainland China, who settled on this island about 300 to 500 years ago. Of the total population, about 40 percent is agricultural (Table 1). The agricultural population increased from 4.5 million in 1954 to 6.0 million in 1970, but its percentage in total population decreased from 51% to 41% in the same period.

The family size of Taiwan farmers is quite large, averaging 6.81 persons per family in 1970. It was 6.26 in 1954, and has been increasing since then, although the rate of increase has declined in recent years. However, not all of the farm family members are engaged or specialize in farming. Some of them have full-time

off-farm employment and many have part-time work off the farm. Increasing numbers of farm family members, especially younger ones, are taking part-time off-farm jobs. This changing situation is especially noted in areas where the manufacturing industry is growing rapidly.

TABLE 1

Agricultural Population of Taiwan

Year	Total Population (1,000's)	Agricultural Population		
		Number (1,000's)	Percent of Total	Average Size of Family
1956	9,390	4,699	50.02	6.30
1957	9,690	4,790	49.43	6.31
1958	10,039	4,881	48.62	6.34
1959	10,431	4,975	47.69	6.38
1960	10,792	5,373	49.79	6.84
1961	11,149	5,467	49.04	6.83
1962	11,512	5,531	48.05	6.83
1963	11,884	5,611	47.21	6.80
1964	12,257	5,649	46.09	6.77
1965	12,628	5,739	45.45	6.77
1966	12,993	5,806	44.68	6.80
1967	13,296	5,949	44.74	6.85
1968	13,650	5,999	43.95	6.84
1969	14,335	6,152	42.92	6.94
1970	14,676	5,997	40.86	6.81

Sources: **Household Registration Statistics of Taiwan,** 1959-1961, Department of Civil Affairs, Taiwan Provincial Government, July, 1972.
Taiwan Agricultural Yearbook, 1971 edition, Department of Agriculture and Forestry, Taiwan Provincial Government, July, 1971.
Taiwan Statistical Data Book, 1971, Council for International Economic Cooperation and Development, Executive Yuan, Republic of China,

The educational background of Taiwan people is shown in Table 2. It is noteworthy that about 78% of the total (farm and non-farm) population aged 15 years or over are literate and that 17% of the same age group have had secondary or higher education. Educational data for the farm sector alone are not available, but it is known that fewer farmers have received secondary or higher education. With this exception, the educational status of the farmers

probably does not deviate too much from the overall picture. The government has implemented programs to provide out-of-school education to illiterate adults. Since most illiterates are old-aged people, the illiteracy rate is expected to decrease in the near future.

According to year-end 1970 data, 77% of the farmers are owner operators, 12% are part-owner operators who have title to part of the land they till and rent the rest. Only 11% are pure tenants. The low percentage of tenants is mainly due to the successful implementation of land reform programs in the postwar period.

TABLE 2

Educational Status of Taiwan's Population, 1969

	1,000 Persons	Per Cent
Population 15 years old and over	8,506	100.0
a. University and college graduates	220	2.6
b. Senior high school graduates	586	6.9
c. Junior high school graduates	664	7.8
d. Primary school graduates and under	4,417	51.9
e. In school	776	9.1
f. Illiterate	1,842	21.7

Source: **Taiwan Demographic Fact Book, Republic of China,** Department of Civil Affairs, Taiwan Provincial Government, Nov. 1970, pp. 136-137.

The Farm Land

The island is extremely mountainous with the Central Mountain Range, its highest peak rising 3,900 meters or 12,000 feet about sea level, stretching from north to south. Because of the steepness of the mountains, most parts of the island are unsuitable for farming and only about 25% of the total land area, or 905,263 hectares, are currently classified as arable land.

According to the statistics of the Taiwan Provincial Department of Agriculture and Forestry, the actual area of land under cultivation is about 905,000 hectares, of which about 58% (529,000 hectares) is irrigated paddy land and about 41% (336,000 hectares) unirrigated upland. Most of the cultivated lands are in the alluvial plains lying west of the Central Mountain Range.

The average farm size now is only 1.03 hectares—approximately 2.5 acres. About 36% of the farms are smaller than 0.5 hectares, and only about 11% are

larger than two hectares. The fragmentation of farm holdings has continued in recent years. In 1954, for instance, the average farm size was about 1.2 hectares.

TABLE 3

Farm Land of Taiwan, 1970

1. Total Registered Land		1,518,431 hectares
2. Cultivated Land		905,263 hectares
a. Paddy land	528,927	
(1) Double cropping	335,724	
(2) Single cropping	193,203	
b. Upland	376,336	
3. Non-cultivated Land		613,168 hectares
4. Number of Farm Families		880,274
5. Average cultivated land area per farm family		1.03 hectares

Source: **Taiwan Agricultural Yearbook,** 1971 Edition, Department of Agriculture and Forestry, Taiwan Provincial Government, July 1971.

Because of the scarcity of land, intensive utilization of farm land has been one of the significant features of Taiwan agriculture. On most of the cultivated land, two or more crops are grown yearly. According to the "Report on Farm Record-Keeping Families in Taiwan,"[1], the average multiple cropping index of the 404 farmers who completed the record keeping in 1969 is 190, indicating that the farmland is, on the average, utilized almost twice a year. This intensive land use is made possible by many factors, including market outlet, capital supply, technical developments such as relay-planting methods, and favorable weather conditions.

Farm Capital

The asset and capital structure of Taiwan farmers is illustrated in Table 4, using the data on the afore-mentioned group of 404 record-keeping farmers. The total assets of a farm in the group as of the end of 1969 was NT$ 346,435 or roughly US$8,660. Assets per farm appeared low. However, due to the small farm size, the average asset value per land unit was quite impressive. The 404 sample farmers, on the average, cultivated 1.37 hectares of farm land, while the overall average was 1.03 hectares per farm. This puts the per hectare asset value at NT$252,872 or US$6,322[2]

1) *Report on Farm Record-Keeping Families in Taiwan, 1970,* Department of Agriculture and Forestry, Taiwan Provincial Government, October, 1971.

2) In United States, the physical farm assets were valued at $107,419 million on 1,159 million acres of farm lands: about $100 per acre or $247 per hectare. See Alvin S. Tostlebe: *Capital in Agricure-Its Formation and Finance Since* 1820, Princeton University Press, 1952.

TABLE 4

Balance Sheet of 402 Farm Record-Keeping Farmers in Taiwan
(December 31, 1968)

Item	NT$ (1)	Per Cent
I. Total Assets	346,435	100.00
A. Current Assets	44,404	12.82
1. Cash	4,284	1.24
2. Deposits, receivables, prepaid, etc.	10,893	3.14
3. Farm product in storage	9,351	2.70
4. Growing crops	8,729	2.52
5. Livestock and poultry	9,031	2.61
6. By-products and processing products	536	0.15
7. Farming materials and equipment	1,581	0.46
B. Fixed Assets	302,030	87.18
1. Land	253,323	73.12
2. Buildings	31,506	9.09
3. Orchards and trees	7,305	2.11
4. Farm machinery	9,897	2.86
II. Total Liabilities	346,435	100.00
A. Liabilities	20,970	6.05
1. Short-term borrowings	15,256	4.40
2. Accounts payable and prereceived	5,714	1.63
C. Net Worth	325,465	93.95
1. Surplus	10,417	3.01
2. Capital	315,048	90.94

(1) NT$40=US$1.00

Source: **Report of Farm Record-Keeping Families in Taiwan, 1970,** Department of Agriculture and Forestry, Taiwan Provincial Government, October, 1971.

Of the farm assets, about 13% are current and 87% fixed in nature. The most important items of the current assets are: cash and cash-equivalent, (cash, deposits, receivables, etc.) 4.38%; growing crops, 2.52%; livestock and poultry, 2.61%; and farm products in storage, 2.70%. Of the fixed assets, land is the most important single item accounting for 73% of the total assets, with buildings (9.09%) and machinery (2.86%) following. From this brief sketch, it is clear that the fixed factors are dominant in the asset structure of Taiwan farmers, leaving only a small portion that can be mobilized for use as working capital.

The breakdown of the total liabilities gives a general picture of how assets are financed. The liabilities, both current and fixed, account for only 6.05% of the

total financing. The balance of 93.95% is self-financed. Since investment demand is distinctly seasonal, the point in time at which the balance sheet figures are taken influences the results obtained. For instance, December 31st is in a slack season at which time most crops are being harvested and marketed, and many short term debts have already been repaid with the sales proceeds of that year. However, the main body of the assets, which is financed with the farmers' own capital, does not seem to be altered by the above qualifications.

The Agricultural Industry

Rice occupies an important position in Taiwan's agricultural production. In 1970, Taiwan farmers produced 2.6 million metric tons of brown rice (husked, but not polished) which accounted for 32% of the total value of agricultural production. Other major crops are sweet potatoes, 6.63%; sugarcane, 3.24%; fruits which include bananas, pineapples, and citrus, 8.30%; and vegetables, 10.08%. Livestock production accounts for about 30% of the total value of agricultural production. Hog is by far the most important farm animal contributing about 67% of the livestock production. Generally speaking, the livestock industry means hog raising to the majority of Taiwan farmers.

TABLE 5

Amount and Value of Agricultural Products of Taiwan, 1970

Item	Amount (1,000m/t)	Value (NT$1,000,000)	Percentage
Rice	2,463	13,681	31.66
Sweet Potatoes	3,441	2,867	6.63
Sugar Cane	5,991	1,402	3.24
Fruits		3,587	8.30
Vegetables		4,357	10.08
Hogs (1,000 Head)	4,320	8,545	19.77
(Livestock Total)		12,814	29.65

Source: **Taiwan Agricultural Yearbook,** 1971 Edition, Department of Agriculture and Forestry, Taiwan Provincial Government, July, 1971, pp. 28-29.

While 41% of the total population is agricultural, agriculture contributes only about one fifth of the total net domestic product of this island. This rate has followed a continuously decreasing trend. In 1958, for instance, it was 32%; but in 1970, it decreased to 19%, even with non-farm income taken into account. Farmers' income on a per capita basis is about 60% of the level of non-farm workers.

Taiwan's agricultural production has increased steadily during the last decade.

With 1964 as the base period, the general agricultural production index was 133.2 in 1970, an increase of about 4.6% per annum on a fixed base. During this period, fisheries made especially good progress recording 119% increase in 14 years, or about 9.1% per annum. Livestock experienced a 95% production increase; forestry, 51.1% and crops, about 48.5%.

The average farm family earnings (defined as gross farm income minus operating expenses, i. e., earnings of family labor, owned land and owned capital) was NT$52,550 or US$856 per farm family in 1970.[3)]

TABLE 6

Industrial Origin of Net Domestic Product of Taiwan

Year	(NT$1,000,000 at Current Price)		
	Total	Agricultural	Percentage of Agricultural in Total
1958	35,947	11,127	31.0
1959	41,614	12,591	30.3
1960	50,833	16,528	32.5
1961	57,087	17,872	31.3
1962	61,646	17,891	29.0
1963	70,749	18,844	26.6
1964	84,722	23,509	27.7
1965	91,888	24,797	27.0
1966	102,296	26,326	25.7
1967	115,432	28,336	24.5
1968	133,694	31,748	23.8
1969	149,260	30,244	20.3
1970	171,364	32,743	19.1
1971	196,404	34,669	17.7

Note: Agriculture includes forestry, fisheries and livestock.
Source: **Taiwan Statistical Data Book,** 1972, Council for International Economic Cooperation and Development, pp. 23-24

A farm income survey showed that in 1967 the farm families in Taiwan earned, on the average, an income of NT$68,619 or US$1,715 per family. Of this amount NT$54,317 or 79.16% was from agricultural and NT$14,302, or 20.84% from non-agricultural sources. On the outlay side, NT$30,739 (44.80%) went as farming expenses, NT$34,661 (50.51%) as family living expenses, and NT$3,219 (4.69%) as savings. The details are presented in Table 8.

3) *Major Economic Indicators for Taiwan's Agriculture,* Joint Commission on Rural Reconstruction, Rural Economics Division, January, 1972.

TABLE 7

Index Numbers of Agricultural Production (1964=100)

Year	General	Crops	Forestry	Fisheries	Livestock
1957	73.0	76.0	51.1	59.3	74.1
1958	78,5	80.4	60.5	64.4	84.1
1959	79.4	80.6	72.5	67.1	83.0
1960	80.4	82.1	74.0	70.1	79.8
1961	87.3	87.9	82.1	83.3	88.3
1962	89.2	89.0	83.4	86.3	93.9
1963	88.7	87.8	82.4	92.6	94.3
1964	100.0	100.0	100.0	100.0	100.0
1965	107.4	108.3	103.6	101.8	106.9
1966	113.0	113.4	94.3	113.8	118.7
1967	119.7	118.1	97.9	123.7	135.1
1968	127.0	123.8	102.8	148.9	142.9
1969	125.7	119.2	96.5	164.0	152.6
1970	133.2	124.5	102.2	178.1	169.1
1971	136.0	125.8	109.7	189.1	173.7

Source: **Taiwan Statistical Data Book, 1972,** Council for International Economic Cooperation and Development., p.47.

TABLE 8

Farm Family Income and Expenditure (1967)

Item		NT$
Farm family income		68,619
Farm income	54,317	
Non-farm income	14,302	
Farm family expenditures		65,400
Farming expenditures	30,739	
Living expenses	34,661	
Surplus		3,219
Total farm assets		308,456

Source: Mien-nan Sung and Yu-hsien Yu: **A Survey on the Farm Family Income of Taiwan 1967.** Published by College of Agriculture, Taiwan Provincial Chung Hsing University, March 1969.

While part of the agricultural production in Taiwan is primarily for home consumption, an important part of it is highly commercialized (about 73% in 1966). The degree of commercialization varies widely from crop to crop. For instance, about 55% of the rice yield, the most important food crop, is commercialized, while the balance of about 45% is retained for family consumption. The lowest rates of commercialization are found in rice and sweet potatoes, both at 55%, with the remaining be used for human consumption and feeding animals. About 80 to 90%

of vegetables, and more than 90% of fruits are marketed off-farm. Some important cash crops such as sugarcane, jute, tobacco, mushrooms, asparagus, bananas, pineapples, etc. are nearly 100% commercialized.

TABLE 9

Percentage of Farm Production Marketed Off Farm in Taiwan

Product	Percentage	Product	Percentage
Rice	55.4	Banana	99.3
Sweet potato	55.5	Pineapples	96.6
Wheat	97.3	Citrus fruits	93.2
Corn	90.1	Other fruits	97.7
Soy bean	91.7	Mushroom	97.5
Other beans	91.7	Radish	92.6
Sugarcane	98.5	Irish potato	95.1
Tea	99.8	Green onion	93.8
Peanut	86.9	Cabbage	89.2
Cassava	92.1	Watermelon	95.8
Jute	99.4	Tomato	94.4
Cotton	100.0	Other vegetables	57.9
Citronella	100.0		

Source: **Survey Report on the Sale and Purchase Made by The Farm Families in Taiwan,** Taiwan Provincial Food Bureau, December 1965.

Food Consumption

The per capita annual food consumption in Taiwan is shown in Table 10. The data in this table indicate the availability of food supplies rather than actual consumption in the strict sense because they are estimates from aggregative data. However, these data are important in that they indicate how the agricultural marketing system is functioning in bridging the gap between producers and consumers in Taiwan.

From Table 10, it can be seen that a major part of the energy intake of Taiwan consumers comes from starchy foods, namely rice, wheat flour, and sweet potato. In 1969, for instance, the per capita daily food availability was 2,616 calories, of which 1,352 calories were supplied by rice, 252 calories by sweet potato. The above three items provided 65% of the energy requirment of the Taiwan people. It should also be noted that 49% of the per capita daily protein intake of 72 grams comes from vegetables, 23% from animal products, and the balance from other foods.

TABLE 10

Per Capital Annual Food consumption in Taiwan

(kg)

Year	Rice	Wheat Flour	Sweet Potato	Sugar	Beans	Vegetables	Fruits	Meat	Fish
1958	131.74	20.16	69.44	9.41	22.10	60.59	20.94	18.64	20.74
1959	135.31	19.09	65.58	9.41	20.85	59.10	19.40	16.67	21.29
1960	137.74	20.02	65.37	9.41	23.51	61.05	22.07	16.24	21.67
1961	136.78	24.57	55.04	9.41	25.24	57.18	19.86	15.60	25.33
1962	132.10	22.04	51.60	9.41	21.81	56.16	21.62	16.04	26.14
1963	134.36	18.47	43.83	9.22	24.10	60.28	20.74	17.90	27.27
1964	129.87	17.17	53.14	9.58	26.57	56.58	17.81	18.45	28.20
1965	132.85	22.33	48.31	10.03	27.95	56.81	21.01	19.21	27.74
1966	137.42	16.58	44.45	11.70	27.46	52.67	26.18	22.91	28.84
1967	141.47	13.43	45.70	8.60	36.61	55.68	34.11	29.89	28.85
1968	137.89	16.76	44.76	11.38	29.28	59.75	36.97	23.55	37.12
1969	137.73	25.19	33.43	12.67	27.49	74.43	35.62	27.50	29.88

Source: Joint Commission on Rural Reconstruction.

Table 11 shows the family expenditure of Taiwan people. Thc consumption expenditure per family was NT$38,131, of which almost 50% was spent on food. The food expenditure might be somewhat over-estimated.

TABLE 11

Family Consumption Expenditure of Taiwan on Non-capital Items, per Household, 1970

Item	Amount (NT$)	Percentage
Total	38,131	100.00
Foods	18,150	47.60
Beverage	523	1.37
Tobacco and cigarrette	1,330	3.49
Clothes	2,208	5.79
Fuel and electricity	2,012	5.28
Rent and water	4,924	12.91
Furnitures and household appliances	923	2.42
Household management	588	1.54
Health and sanitation	2,269	5.95
Recreation	1,016	2.66
Transportation and communication	1,143	3.00
Misselaneous	3,045	7.99

Source: **Report on the Survey of Family Income and Expenditure in Taiwan, 1969,** Bureau of Accounting and Statistics, Taiwan Provincial Government.

MARKETING AGENCIES AND MARKET ORGANIZATIONS

Marketing Agencies

In its widest sense, agricultural marketing comprises all the operations and activities involved in moving agricultural commodities from producers to consumers, excepting those activities which change the nature and use of the product and those which are so technical in nature as to become specialization in themselves. Any agency performing any marketing operations and activities is called a marketing agency. Agricultural marketing is a many-sided task, including assembly, storage, transportation, processing and transaction, i.e., moving of agricultural goods through time, space, form and ownership. Agricultural marketing agencies are differentiated in many respects too, ranging from a single individual engaged in the handling of a single commodity and performing a simple function to a giant enterprise, engaged in an all-inclusive venture and performing extremely complex functions. They are briefly described as follows:

Producers

To some extent, producers of agricultural commodities perform some sort of marketing functions also, though, as a rule, the functions they perform are very simple in nature and rather unimportant in the overall weight. This is very commonly observed in the local markets, in which producers sell their produce directly to consumers in addition to selling to country buyers and local retailers. What the producers do are usually very short-range transportation and retail transaction. In most cases, only those products ready for final consumption are handled this manner although in some cases short-period storage and simple treatment or processing may be done before transfer of the commodity. As specialization and commercialization in agriculture develop, however, individual producers as independent marketing agencies show a declining tendency in importance.

Producers' Cooperatives

Cooperative marketing of agricultural commodities in Taiwan has made phenomenal progress during the post-war period. Farmers' cooperatives have gained importance not only for the items they handle and functions they perform, but also because of the market shares they maintain. Being producers' organizations, these farmers' cooperatives are primarily cooperatives concerned with protecting producers' interests by offering more alternatives to the farmers in marketing their produce. Through rationalization of marketing operations, upgrading of marketing

efficiency and facilitating of producers' response to market changes, however, the producers' cooperatives also contribute to the promotion of the economic welfare of the consumers.

There are two systems of farmers' cooperatives which are important in marketing farm produce. The first one is multi-purpose farmers' cooperatives and the second single-purpose farmers' cooperatives. The farmers' associations belong to the first category while fruit marketing cooperatives belong to the second. In most cases, a farmer participates in both organizations.

The farmers' associations (FAs) of Taiwan are organized on the basis of administrative areas: one FA for each township and one FA federation for each prefecture. There are now in Taiwan province a total of 328 local FAs at the township level, 20 federations of township FAs at the perfectural level and 1 federation of the prefectural FAs at the provincial level with a combined membership of 899,460 farm families. The FA marketing operations deal mainly with rice and other food grains, and they include collection, inspection, storing, processing, transportation and sales. In addition to grain marketing, many of the FAs are engaged in the operation of markets for vegetables, fruits, and livestock, marketing of mushrooms, asparagus, poultry and eggs, hogs, jute, cotton, corn, and many others. Some of them manufacture mixed feeds for chickens and hogs and produce mushroom spawn. The Provincial Farmers' Association operates a milk bottling plant and a pesticide plant in central Taiwan.

Unlike the farmers' association, the organizational and business areas of fruit marketing cooperatives are not confined to administrative boundaries. At present, six fruit marketing cooperatives and a federation of them are operating in Taiwan. While three are operating within the boundaries of a prefecture, the others cover more than one prefecture. The main business of these cooperatives is marketing of bananas and orange, although they are also concerned with other fruits. One of the cooperatives operates a cannery specializing in the canning of oranges, mushrooms, asparagus and manufacturing and canning of fruit juice.

Government Agencies

Some government agencies in Taiwan also handle marketing of farm products. The most important one is the Provincial Food Bureau which controls about one half of the marketed rice. Other agencies include the Provincial Supply Bureau which handles jute and the Provincial Tobacco and Wine Monopoly Bureau which collects tabacco leaves and grains for making cigar and cigarettes and wine.

Government participation in the marketing of agricultural commodities is partly for raising revenues.

Country Buyers

In the rural areas, there are many country buyers who collect agricultural produce directly from the farmers or at local markets. Some of them are full-time traders who assemble farm products and ship them to distant consumer markets without much treatment, processing or storage except in the case of rice. Many of them, however, are part-time traders who have various other interests. They may be farmers who collect, in addition to their own, produce of their neighbors; small landlords and village storekeepers, etc. Some of them may perform marketing functions only occasionally and make no or little investment in fixed marketing facilities.

Rice merchants in the rural areas are by far the most important people belonging in this category. In most cases, they own rice warehouses, rice hulling and polishing facilities of varying capacities. They buy paddy (unhusked rice) from the rice farmers, hull the paddy and ship the brown rice to wholesale markets or polish the brown rice and retail white rice (polished rice) to local consumers. More often than not, they store paddy for the client farmers and process paddy into polished rice for farmers' home consumption on a fee basis.

Wholesalers

Wholesalers in the pure sense are those who receive agricultural commodities from country buyers or processors and distribute them to retail merchants or processors on a wholesale basis. In the agricultural marketing circle, eowever, pure wholesalers are relatively few. In many cases, wholesalers may at the same time perform the country buyer's function of direct collection, especially when they are operating in the producing areas; they may at the same time perform the retailer's function of selling, especially when they are established in the consumption centers; and warehousing, especially when the commodities they handle require these treatments before being moved one step further in the marketing process. In the case of rice wholesalers, they are usually concurrently millers, warehousemen and retailers.

Wholesalers are very often regarded as speculators who are willing to assume greater risks than others. They buy when and where prices are low and, after storage and transport, sell when and where prices are high. They may finance the movement of the commodity and in general assume most of the marketing risks. In fact, by buying when and where supply is abundant relative to demand, moving

goods over time and space, and attempting to sell when and where demand is high relative to supply, wholesalers provide very useful services to increase the total value of the available commodity. By levelling out extreme price fluctuations over time and space, wholesaler's function may help stabilize market conditions to the advantage of both producers and consumers.

Packers, Processors and Warehousmen

To a varying extent, packers and processors change the form of the products they handle to one more convenient for marketing and consumption. They are equipped with packing and processing facilities, technical know-how and capital to carry out the transformation of the product. In Taiwan, the most commonly found packers and processors of farm products are rice mills, starch factories, fruit and vegetable canneries, sugar mills, oil extracting plants, milk bottling plants, gunny sack factories, feed mixing plants, livestock slaughter houses, and processing factories.

Warehousmen in Taiwan are hardly specialized or single-purpose ventures. In general, storage function is performed in connection with or incidental to other marketing activities. Practically all the rice mills have warehousing facilities for rice and most of the ice-cube manufacturing plants (refrigeration plants) provide cold storage rooms for storing perishable fruits and vegetables on a consignment or room-lease basis.

Commission Agents and Brokers

Producers and country buyers usually operate far away from the consumption centers in which the farm produce they handle are wholesaled or retailed. Considering the time and expenses involved in attending transactions in person, producers and country buyers often find it convenient and economical to consign the selling of the produce they ship from the producing area to commission agents established and operation in the wholesale markets. This also applies to the buying activities at the producers markets which are not conveniently accessible to wholesalers, retailers and processors. Commission agents are therefore those who specialize in buying and selling for absent principals without assuming any risk of transactions by obtaining titles to the commodities in question. For the services they render, they are in general remunerated in the form of a commission expressed as a certain percentage of the sales proceeds.

In the Taipei Fruit and Vegetable Wholesale Market, there are about 500 sales agents who receive shipments from country buyers and sell the produce on behalf of these shippers. Buying agents are more often found in the producing areas, who

act as the agents of processors of a particular commodity, especially in the procurement of raw materials for larger processors or manufacturers.

Brokers are those who locate potential suppliers for the buyers or find potential buyers for the sellers. By bringing potential buyers and sellers together, brokers help widen the potential market to the full extent. As a rule, they do not take part in the actual transaction. However, there may be exceptions to the rule. They are remunerated by either sellers or buyers or by both of them, depending on the terms of transaction they agreed upon. They do not play an important role in agricultural marketing in Taiwan.

Retailers

Selling commodities to the final consumers, the retailers constitute the final link in the chain which connects producers and consumers. They set up establishments,

TABLE 12

Number of Major Marketing Agencies in Taiwan

Kinds	Number
A. Licensed Rice Merchants (as of the end of 1970)	
1. Retailers	6,638
2. Wholesalers	78
3. Purchasers	44
4. Millers	462
5. Warehousemen	45
6. Brokers	14
7. Miller-retailers	1,394
8. Miller-wholesaler-retailers	1,042
9. Miller-warehouseman-retailers	888
10. Miller-warehouseman-wholesaler-retailers	2,704
11. Purchaser-miller-wholesaler-retailers	199
12. Purchaser-miller-warehouseman-wholesaler-retailers	1,647
13. Purchaser-miller-warehouseman-retailers	201
14. Purchaser-wholesalers	185
15. Wholesaler-retailers	649
16. Others	998
Total	17,188
B. Registered Food Processing Factories (Export food canning factories 177)	2,668
C. Sugar Mills in Operation	22
D. Refrigeration Plants	470
E. Gunny Sack Factories	4

procure supplies, display the goods in forms and at times suitable, convenient and appealing to the customers, and transfer them to the hands of the consumer. Retailers in general are small establishments, buying from producers, wholesale distributors or processors in relatively large lots, and breaking the goods down into smaller units suitable for purchase by a large number of small consumers on a cash basis.

In selling to the final consumers, the retailers in general only perform distributive function. In some cases, they may add functions of a secondary importance, such as pre-selling treatment, packaging or bundling, grading and storage, etc.

Some statistics on the number of different marketing agencies in Taiwan are presented in Table 12.

Market Organizations

In its widest sense, a market means an area in which the forces of demand and supply establish relationship to each other. Defined this way, a market does not subject itself to any spatial limitations; it may be as small as a road-side market where direct transactions take place; it may also be large as an international market where supply and demand of one commodity are equated to create a price which will clear the market. Here, however, the term "market" is used in its narrowest sense. It is confined to a tangible entity, in which buyers, sellers or their representatives meet together to undertake transactions, with or without the actual presence of the commodities transacted. This market is established on a permanent site, equipped with trading facilities such as transaction halls and administrative arrangements to facilitate transactions. The existing agricultural market organizations are briefly described in the following.

Assembly Market

Local assembly markets are located in the producing areas where nearby farmers deliver their produce to be sold to country buyers. The typical assembly market is a public or semi-public set-up, provided with an enclosed space. The sellers are in general producers who deliver their produce individually or jointly to the market, display them in the sheltered transaction halls waiting for the inspection of the buyers. The purchasers in the market are usually country buyers who buy on their own account and ship the commodity to the wholesale market or who buy on a consignment basis for somebody else. The buyers may also be local retailers who buy directly from the producers and sell the commodity to final consumers at their own retail stores or stands. For the convenience of the producers, assembly

markets are as a rule situated in the producing areas. They cover relatively limited geographical areas, and their business valumes are relatively small compared to the wholesale markets. The most commonly found assembly markets in Taiwan are livestock markets and vegetables and fruit markets of the producing area.

Wholesale Markets

Wholesale markets are found in large cities or municipalities which are consumption centers. The wholesale markets are permanent establishments constructed and operated by public or semi-public entities. They are necessarily equipped with sheltered transaction halls and other related facilities.

The important buyers at the wholesale markets are local retailers who buy for retailing, specialized wholesalers or exporters who buy for resale at other central markets or for export, and processors or their consignees who buy raw materials for processing or preserving. The main sellers at such markets are country buyers who make shipments from country assembly markets, farmers organizations who make collective shipments directly from the farm, and wholesalers who deliver commodities from other central wholesale markets. Commission agents are more active in the wholesale markets than in any other type of markets.

Retail Markets

Of necessity, retail markets are located in areas where consumers concentrate. The markets usually consist of retail stores, retail booths and retail stands. In Taiwan, most retail markets are established and administered by the local governments.

Sellers in the retail markets are in most cases retailers who procure their commodities from the wholesale markets. They may also be producers themselves, especially at the retail markets in the producing areas. Practically all of the buyers

TABLE 13

Number of Markets in Taiwan (end of 1970)

Kind of Market	Total Number	Operated by		
		Farmers' association and local government jointly	Farmers' association	Local government
1. Fruit and vegetable wholesale market	77	36	29	12
2. Livestock Market	41	4	36	1

Source: **Taiwan Agricultural Products Wholesale Market Yearbook, 1972 Edition** Taiwan Provincial Government, Department of Agriculture and Forestry, p. 3

are individual consumers who buy for final consumption. However, restaurants and other institutional consumers may also buy at the retail market if they demand many kinds of food items at relatively small quantities of each. By and large, retail transactions are completed with cash payment.

The present situation of markets in Taiwan is presented in the following statistical table (Table 13). Although all of the fruit and vegetables markets are named "wholesale markets", some of them belong in the category of local assembly markets. The livestock markets also include assembly and wholesale markets.

MARKETING CHANNELS

Marketing channels are the paths through which agricultural commodities are moved from producers to consumers. Depending on the needed marketing services, marketing facilities and time and spatial distance involved in completing the marketing process, the marketing channels of one farm product may vary greatly from another. In one extreme, there may be a single channel, as in the case of a direct transaction between the producer and consumer, which involves only the two parties concerned and takes only a short time over a short distance to complete, with the form of the product unchanged. In the other extreme, there may be highly complex channels, especially in the case of a product which needs varying degrees of transformation, processing and storage, involving so many marketing agencies and market organizations, and requiring such long distance travel that it is in fact very difficult, if not impossible, to trace out the entire sequence. In addition, marketing channels of farm produce tend to become more and more complex as the degrees of commercialization and specialization in agricultural production increase and as the whole economy proceeds to higher stages of growth and development.

The following is a brief description of the marketing channels of major agricultural products in Taiwan. For want of reliable information from specialized surveys, no quantitative weight is attached to each channel.[4] Moreover, in order to make it easier to visualize the picture, some less important exceptions are omitted. The account, therefore, gives only an approximation rather than a complete review of the condition of existing marketing channels.

Rice

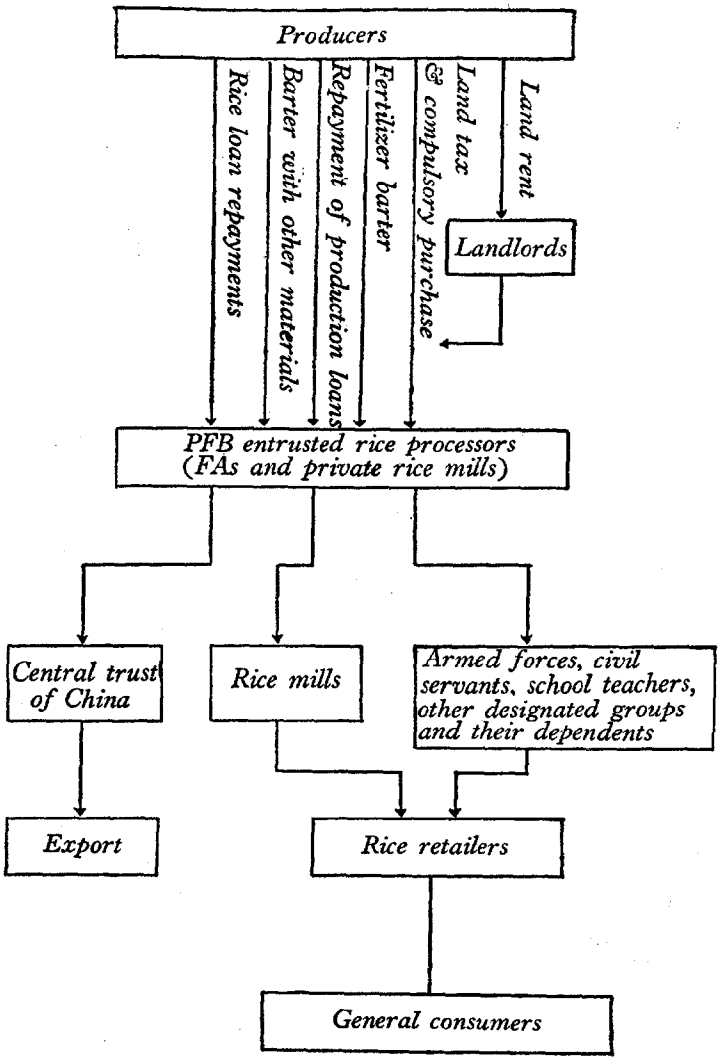
Of the 2.5 million metric tons of brown rice annually produced by Taiwan farmers, about 40% is consumed on the farm as human food, animal feed or seed. Of the remaining 60% of the total production, about 30% is is marketed by the government and about 30% handled as free market rice. The government, i. e. the Provincial Food Bureau (PFB), obtains control of rice through a fertilizer-rice barter system, collection of land tax in kind (paddy), compulsory purchase of paddy at official prices, collection of land-rent on public lands and, repayments of production loans in kind, barter of rice with other materials, etc. The collection,

4) An attempt was made by Dr. Wen-fu Hsu to quantify the flow of various farm products through different channels. See: Wen-fu Hsu "A Study of Agricultural Products Marketing in Taiwan (In Chinese)" April 1969, Published by Department of Agricultural Economics, National Taiwan University.

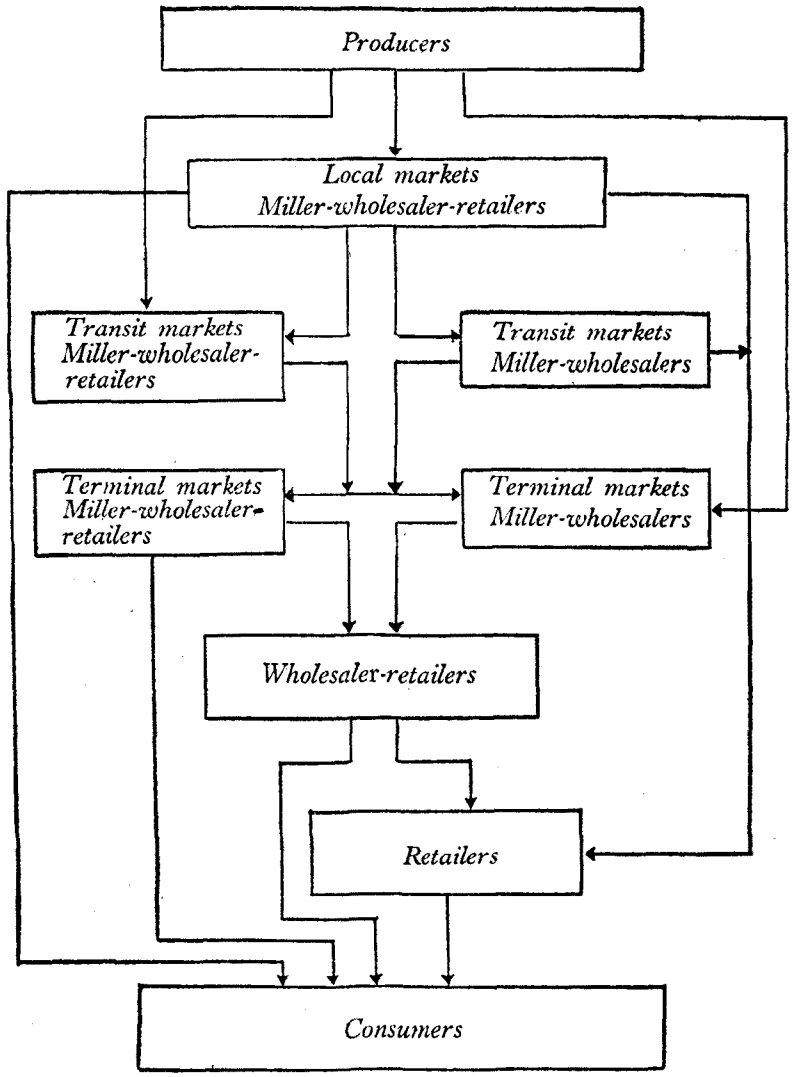
storage and processing of government rice are entrusted to farmers' associations and commercial riee mills on a fee basis, with the former handling approximately three fourths and the latter one-fourth. The government rice is disposed of as rations for the armed forces, civil servants, school teachers, other designated groups such as mine and salt workers, and their dependents. The government also uses the rice it controls for market stabilization by dumping on the market whenever large fluctuations in rice price are observed. Part of the government rice is exported to foreign countries. Detailed statistics on the government procurement and disposal of rice during the last 13 years are presented in Appendixes 1 and 2.

Free market rice moves through normal commercial marketing channels, i. e., local or producer markets, transit markets and terminal or consumer markets, and

MARKETING CHANNELS OF GOVERNMENT RICE



MARKETING CHANNELS OF FREE MARKET RICE

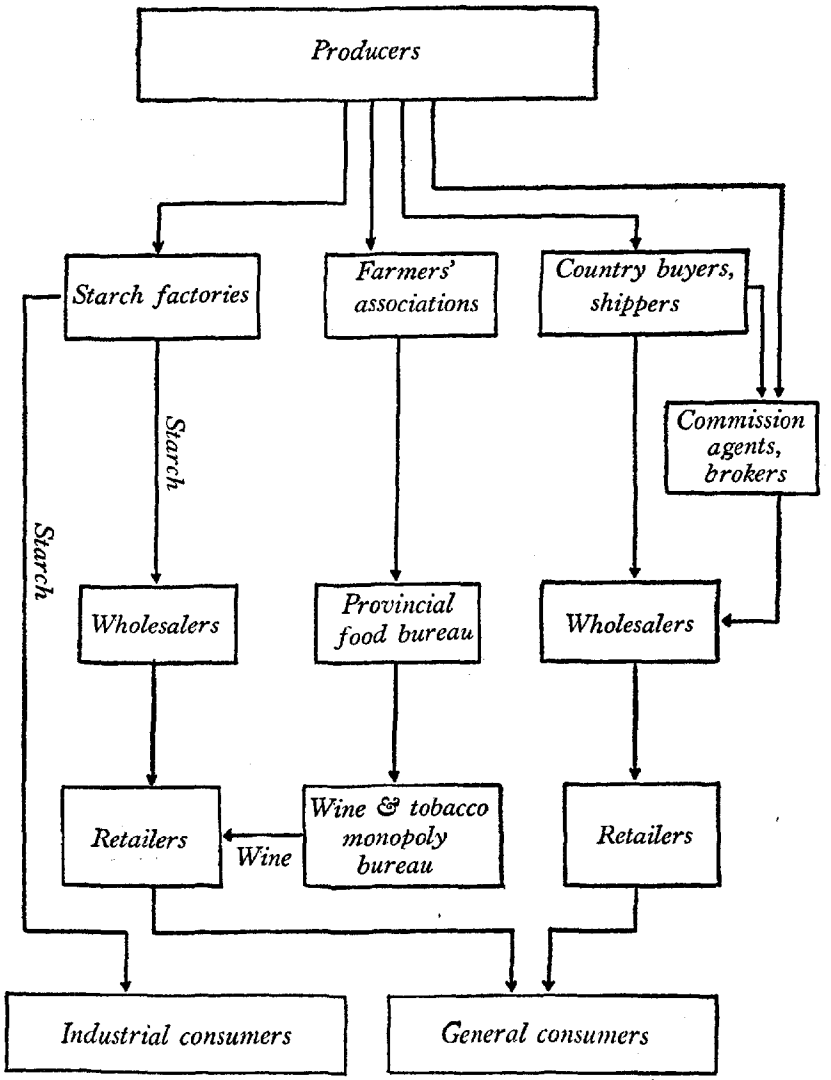


finally gets to the hands of the consumers, although not all of the free market rice goes through these markets. Some of the rice merchants render only one kind of marketing services, while most of them perform two or more marketing acivities.

Sweet Potatoes

As far as gross production value is concerned, sweet potato ranks second among various farm products, next only to rice. Because of its bulkiness and perishability, about 45% of the total production is consumed by farmers as human food or animal feed, and about 55% marketed off-farm fresh. In sweet potato marketing, shipments are usually made by farmers or country buyers to wholesalers or retailers and then sold to consumers. An important portion of the annual yield is preserved in the form of sun-dried chips, and some is processed into sweet potato starch. Processing factories are mainly established and operating in sweet potato producing

MARKETING CHANNELS OF SWEET POTATOES

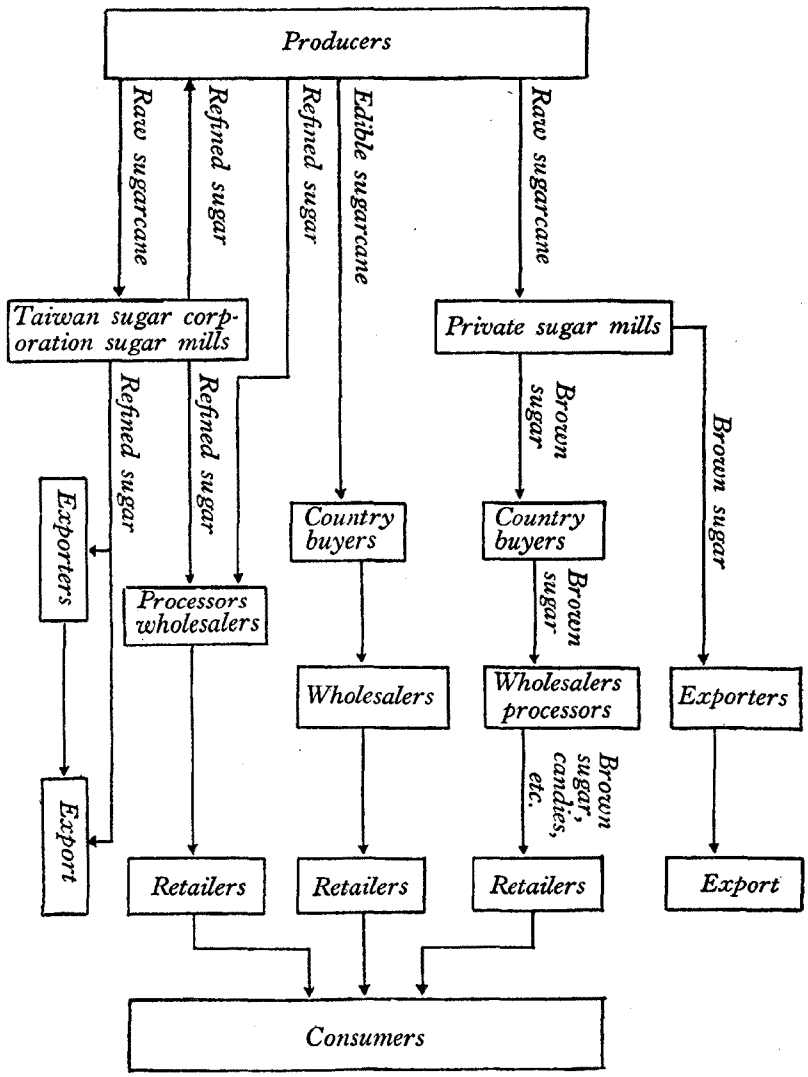


areas, with their products sold to wholesalers, food stores, textile mills, the Taiwan Tobacco and Wine Monopoly Bureau and other factories to be used as food, feed or industrial raw material. The Provincial Food Bureau entrusts the farmers' associations to collect sweet potatoes in peak production season when the price is low, for the purpose of stabilizing market to the advantage of the farmers. The sweet potatoes thus collected by PFB are sold to the Taiwan Tobacco and Wine Monopoly Bureau for wine making and to wholesalers for reselling.

Sugarcane and Sugar

Sugarcane is one of the most important cash crops of Taiwan, with main producing areas concentrated in the southern half of the island. Broadly speaking, there are two kinds of sugarcane, one for eating (chewing) directly and the other for sugar making. The former is negligible in area and production, however.

MARKETING CHANNELS OF SUGARCANE AND SUGAR



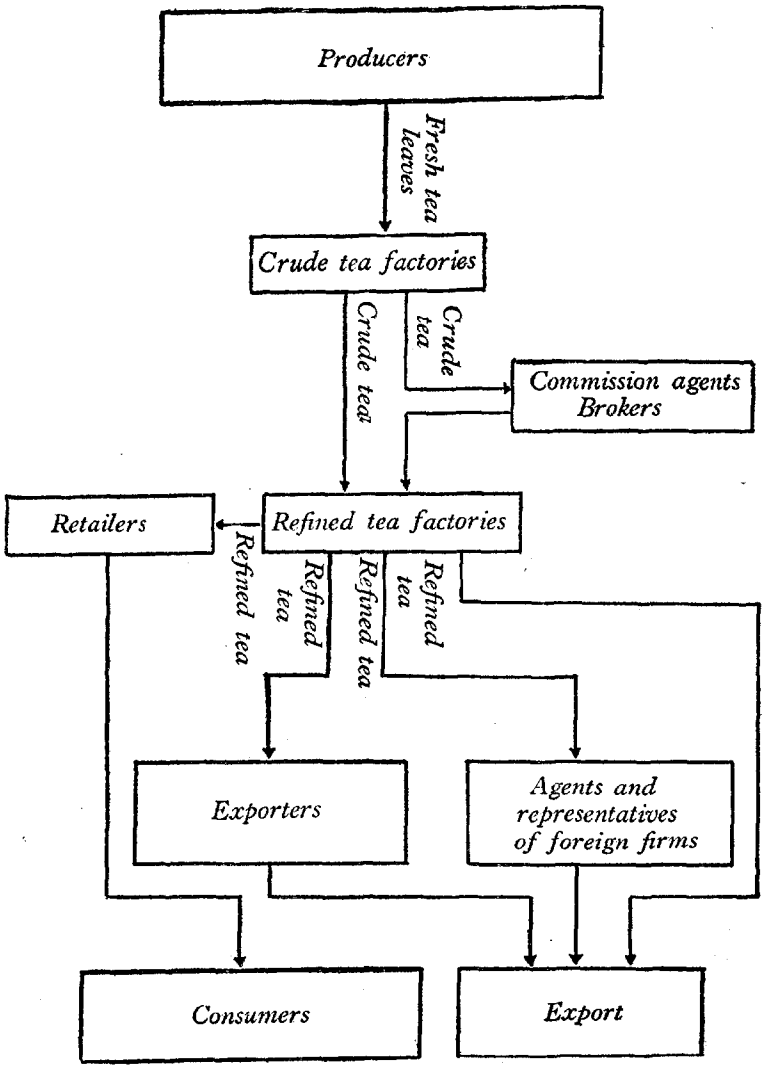
There are two types of sugar mills which are engaged in sugar manufacturing. One is the mills operated by the Taiwan Sugar Corporation (TSC), a state enterprise, which make centrifugal sugar with modern equipment. The other is private mills which make brown sugar with rather out-of-date equipment. With its raw material supplied by its own plantations and contract farmers scattered all over the fertile plain areas of central and southern Taiwan, TSC accounts for about 98% of the total annual sugar production, which has been between 800,000 to 1,000,000 metric tons in recent years. TSC also maintains its own railway network in the sugarcane producing areas, which is used for transport of sugarcane to the mills and production materials to the sugarcane farmers. TSC railroads also provide passenger services for the local people.

The TSC contract farmers share 55% of the refined sugar made from the sugarcane they surrender. They sell their sugar partly on the domestic market and partly to TSC for export. Between 200,000 and 250,000 metric tons of the annual refined sugar output is consumed locally, with the balance exported. The major part of the brown sugar produced by private sugar mills is used as raw material in processing, such as making of candies, with the rest exported.

Tea

Taiwan's tea is produced primarily for export. Up to the first decade of this century, tea had been the single most important export item. With the rise of other commodities however, tea has declined in relative importance in Taiwan's total export in the past half-century. Since only an insignificant amount of the

MARKETING CHANNELS OF TEA



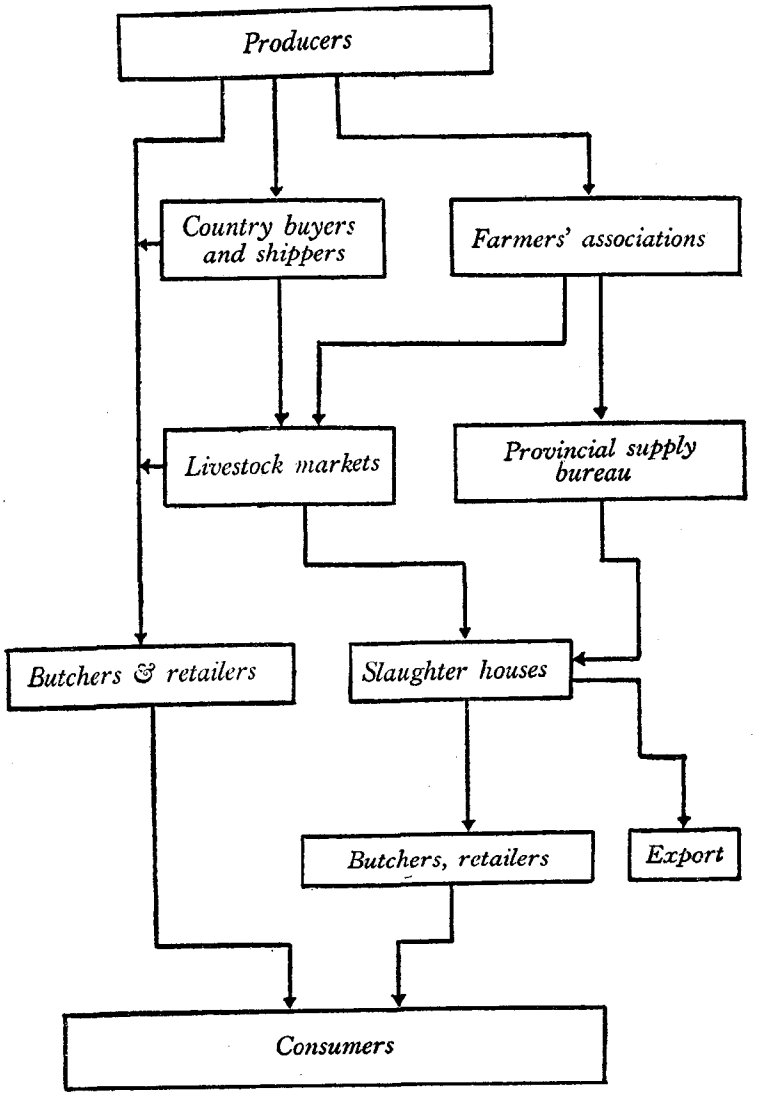
fresh tea leaves is retained and processed for home consumption, tea is also a very important cash crop for Taiwan farmers.

Tea plantations in Taiwan are distributed in the hill area of the northern half of this island. Crude tea factories are located in the producing areas to which tea farmers deliver their fresh tea leaves directly. Crude tea factories sell their product directly to refined tea factories, with some exceptions in which brokers or commission agents act as their intermediaries. Refined tea is exported either by tea factories or by exporters. Some of it is exported through agents or representatives of foreign firms operating in Taiwan.

Hogs

Though very often considered as a rural sideline, hog raising in Taiwan is a

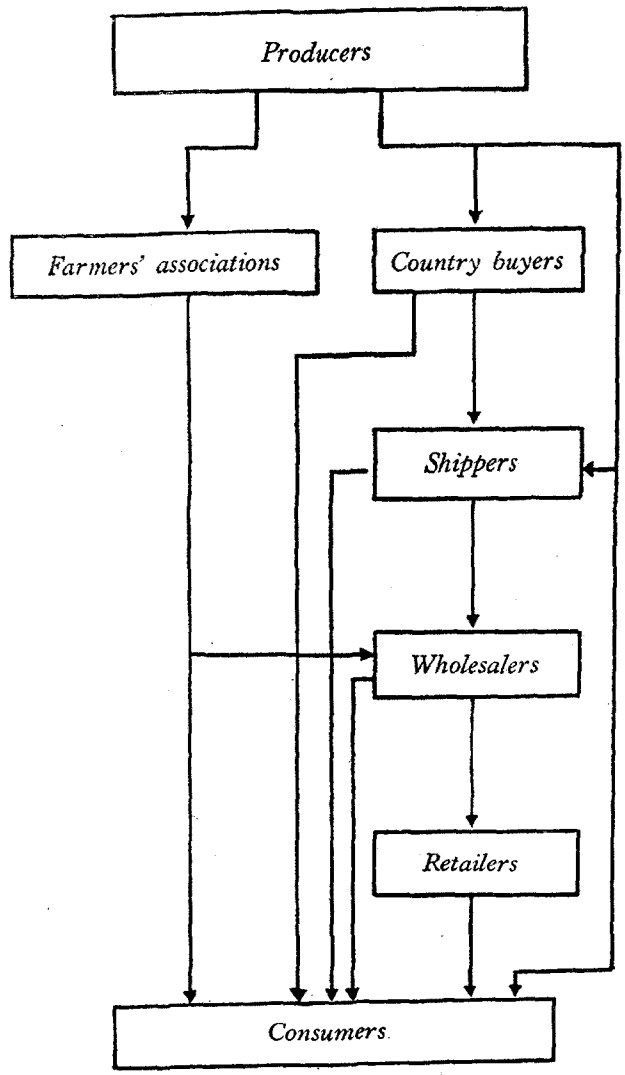
MARKETING CHANNELS OF HOGS



very important and popular cash generating enterprise in rural areas. Since it is uncommon for any farm family to slaughter and consume whole hogs by itself, hog raising is practically 100% commercialized.

There are two major outlets for hogs. One is the cooperative hog marketing system of the farmers' associations, through which hogs are collected and shipped to the livestock markets cooperatively. The other is direct selling to dealers or country buyers who ship the hogs to comsumption centers or for slaughter and retailing at the local market. Most of the hogs are marketed in the form of live animals and slaughter is done by butchers who are generally also meat retailers. In Kaohsiung where construction of modern slaughter facilities was completed in the middle of 1966, and in Taipei where a modern abattoir started operation in

MARKETING CHANNELS OF POULTRY

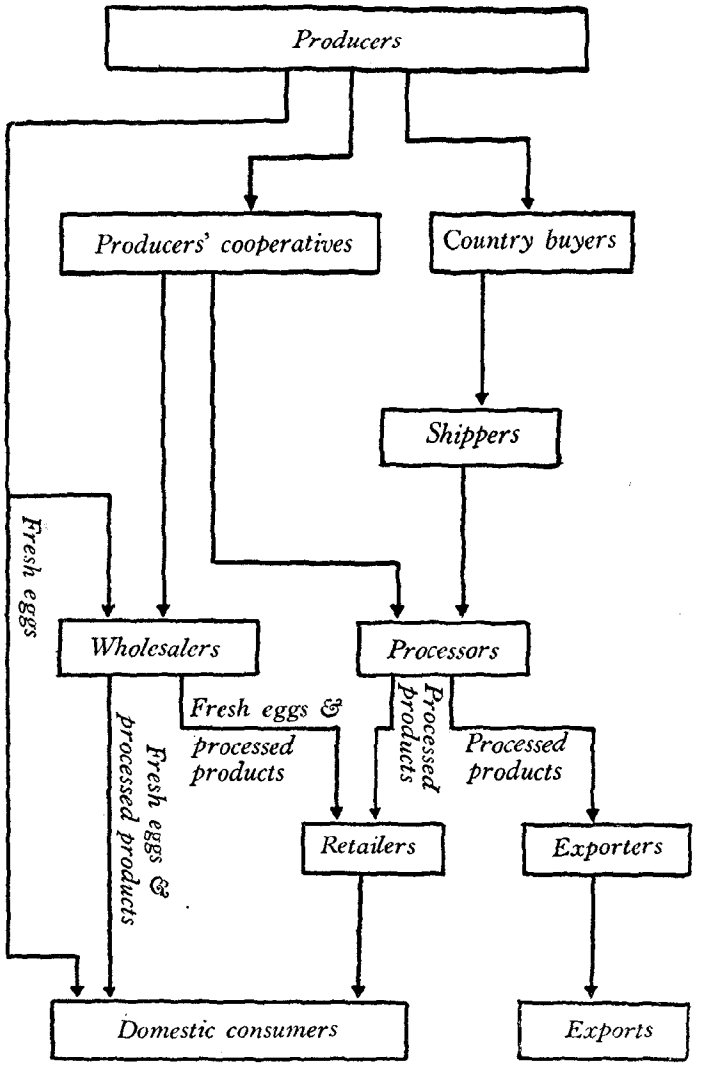


December, 1971, carcass transaction has been introduced and it will be extended to other parts of the island in the near future. In Taipei and Keelung about 20% and 50%, respectively, of the total hog arrivals are supplied through the FA co-operative marketing system while other local markets are mostly dominated by hog dealers.

Poultry and Eggs

The poultry industry in Taiwan is still in the initial stage of development. For many farmers, poultry raising is nothing but a part-time farm business, meant primarily to meet home consumption needs with occasional selling of a few surplus birds, although more and more specialized broiler farms have been established in recent years. Poultry comprises chicken, duck, goose and turkey with the first two dominating. Eggs that appear in the market are in the main chicken and

MARKETING CHANNELS OF EGGS



duck eggs.

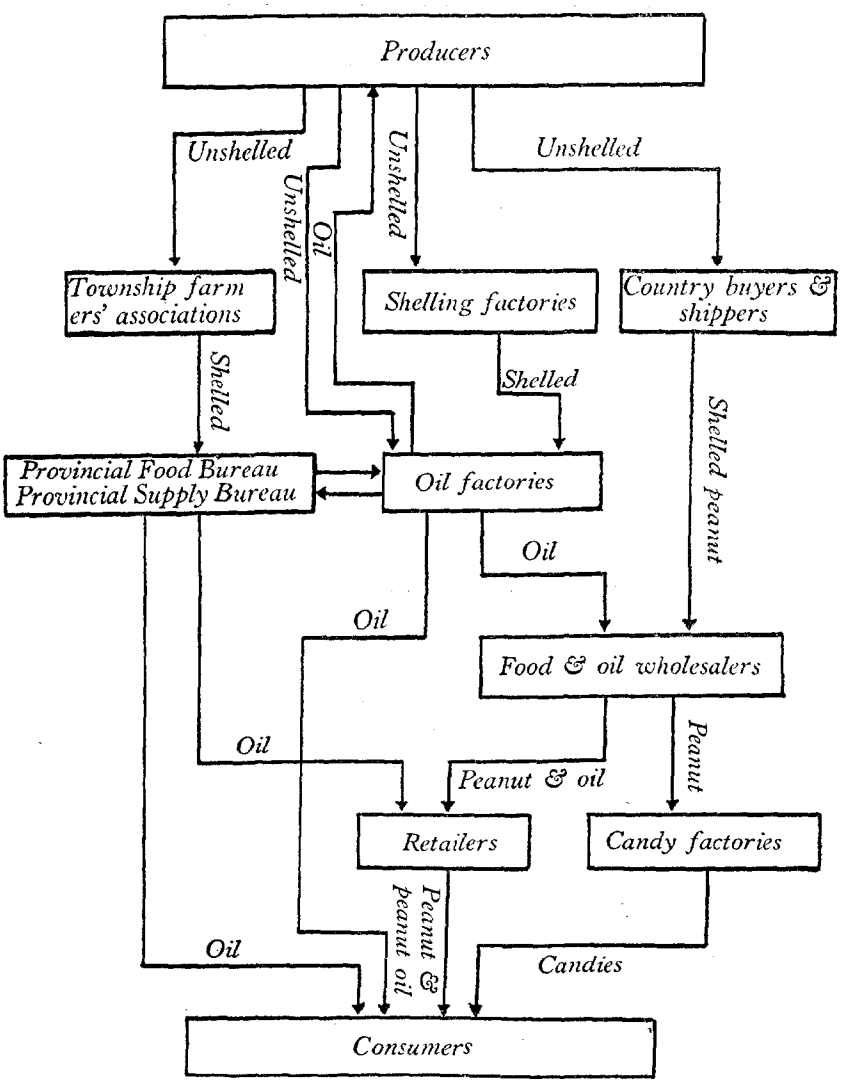
Four kinds of people are involved in the marketing of poultry and eggs, namely, country buyers, shippers, wholesalers and retailers. In recent years cooperative poultry and egg marketing by farmers' associations, which is linked to their feed mixing and supply business, has been growing in importance.

Country buyers collect poultry and eggs from farm to farm and transfer them to shippers in larger townships. The latter ship the goods to wholesalers in large cities who in turn sell the goods to retailers for resale to consumers. Duck eggs are very often marketed in preserved forms, especially those for export.

Peanut and Peanut Oil

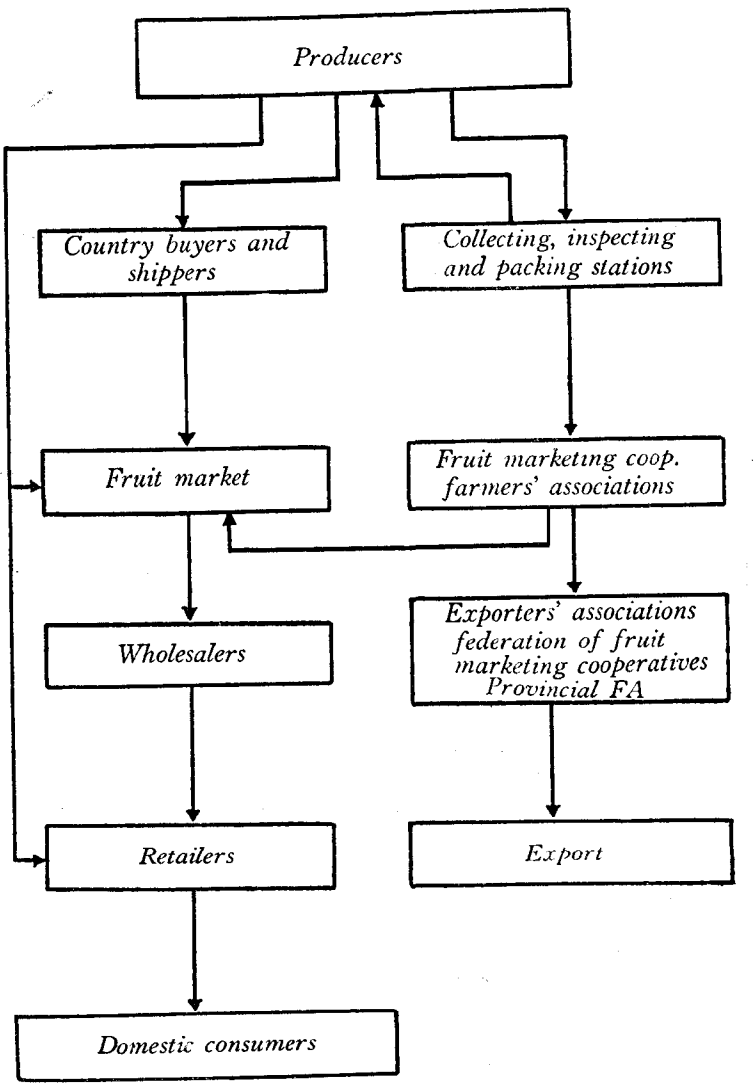
Peanut is one of the major oil crops of Taiwan, mainly used either for direct

MARKETING CHANNELS OF PEANUT AND PEANUT OIL



consumption or extracting of oil. Country buyers and shippers, shellers, oil factories, wholesalers, retailers, township farmers' associations, the Provincial Supply Bureau and the Provincial Food Bureau are the people or agencies connected with the marketing of peanut and peanut oil. At the first stage of marketing, transactions are completed in the form of unshelled peanut. After being moved through shellers, it becomes shelled peanut. The last stage of marketing sees peanut traded and transferred in the form of kernel, peanut candies and peanut oil. Participation in peanut marketing by the Provincial Supply Bureau stems from the need to supply peanut oil as rations for the armed forces, civil servants, school teachers and their dependents, while that by Provincial Food Bureau is aimed at stabilizing prices of peanut and peanut oil.

MARKETING CHANNELS OF BANANA



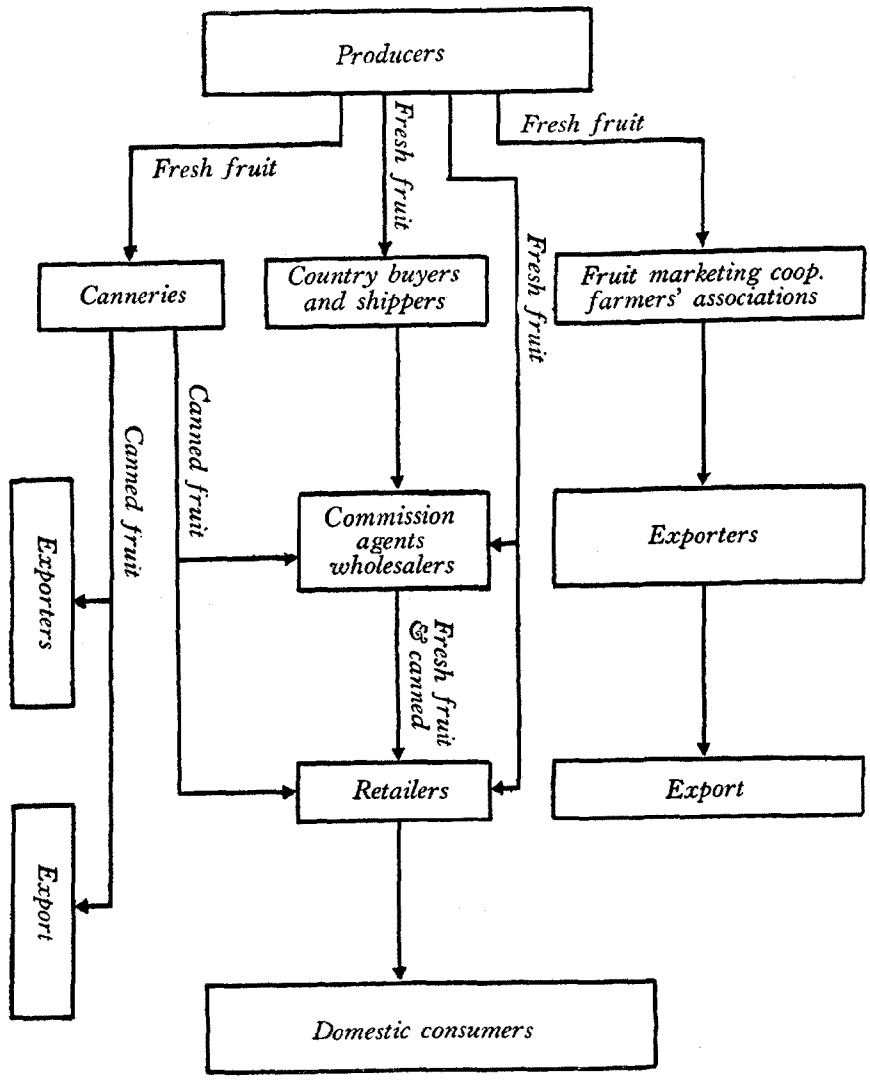
Fruits

Endowed with favorable climatic conditions, Taiwan produces a variety of tropical and sub-tropical fruits.

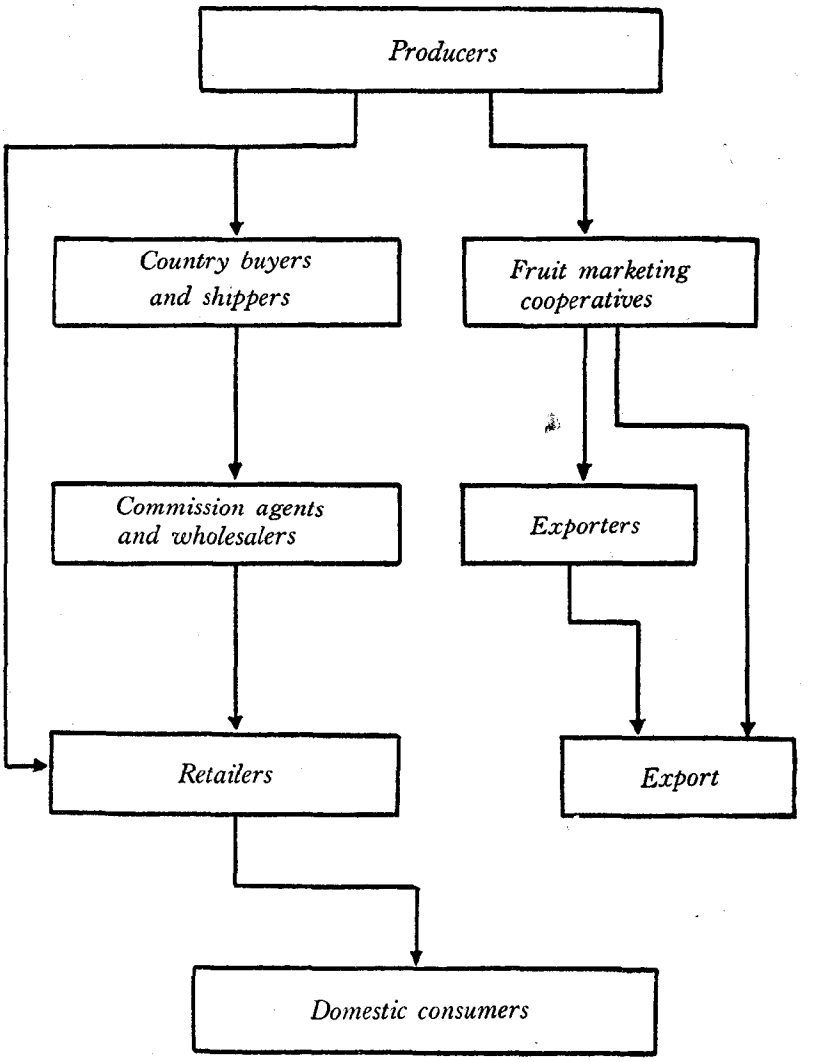
Banana is by far the most important fruit in Taiwan. With production areas scattered in the central and southern areas of Taiwan, it is also a major export item. In 1971, a total of about 20 million cartons of bananas each containing 16 kg. net at the shipping point, was exported, earning 47 million U.S. dollars in foreign exchange.

By using ox-carts, motorcycles or power tillers, banana farmers transport their harvests to nearby collecting stations established by fruit marketing cooperatives or

MARKETING CHANNELS OF PINEAPPLES



MARKETING CHANNELS OF ORANGES



farmers' associations. In the collecting station, bananas are inspected and graded. Only those which meet export requirements are accepted by the cooperative or FA, and after some treatment they are packed in carton boxes and then shipped to seaports for export. Under the current banana export scheme, 50% of the total export is handled by the exporters' association, 45% by fruit marketing cooperatives, and 5% by the Provincial Farmers' Association. Bananas for domestic consumption are marketed mostly by fruit dealers.

In contrast with bananas which are exported fresh, pineapples are mostly exported in processed form as canned fruit. Although export of fresh pineapples have been increasing in recent years, their quantities have been rather small in the total pineapple export.

Raw pineapples for canning are collected jointly by the canneries at prices determined by the Taiwan Provincial Canners' Association. Each cannery is assigned a quota for canned pineapple production which forms the basis for the quantities of raw pineapples and containers it will be allotted. In some exceptional cases, raw pineapples may be supplied to the canning factory by country buyers and shippers. The canned product is exported either directly by the canners or by exporters. Only those cans which are canned for domestic consumption or have been rejected by export inspection are found in the local market.

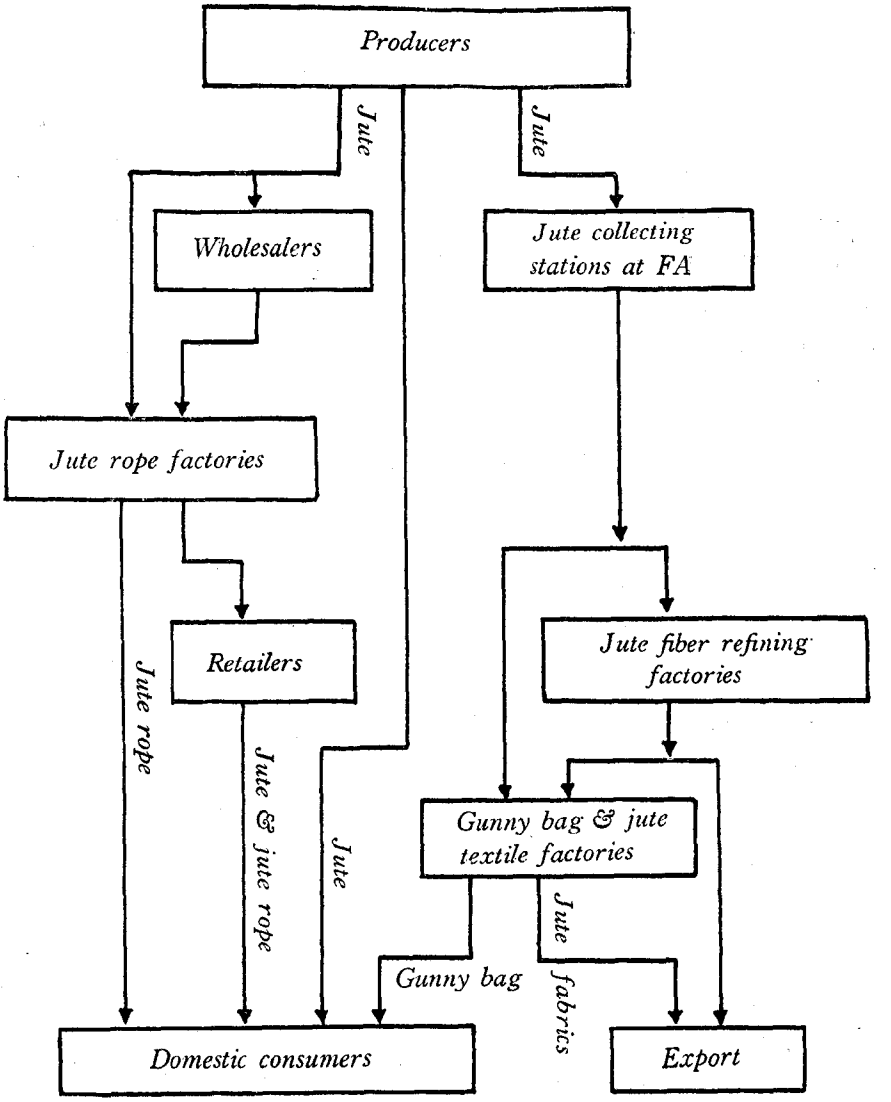
Though relatively unimportant, some fresh pineapples have been exported to Japan by fruit merchants, fruit marketing cooperatives and the Provincial Farmers Association. Various kinds of fruit dealers handle the domestic marketing of pineapples.

As a result of large increases in production, marketing of citrus fruits has developed rapidly in recent years. While fresh fruits dominate the domestic market, both fresh and canned fruits are exported. Because of the need for government inspecton, fresh oranges for export are supplied by the fruit marketing cooperatives which collect, grade, clean, wax, wrap and pack the fruit in wooden boxes or cartons each containing 20 kg. net at their packing stations. Export is handled either by the cooperatives or by exporters. As in the case of other kinds of fruits, domestic marketing is handled by fruit dealers.

Jute

With its production areas distributed mainly in the irrigated fields of central and southern Taiwan, jute is the most important fiber crop grown by Taiwan farmers. It is used for making ropes, jute fabrics and gunny bags for rice, sugar and other commodities. Part of the jute production is marketed in the form of crude jute fiber or jute ropes through commercial channels by wholesalers, jute rope factories and retailers. An important part of the yield is collected by the township farmers' associations in behalf of the Provincial Supply Bureau in the form of retted and crude jute. The latter is then delivered to the jute fiber refining factories of the PSB. The refined jute fiber may be exported by the PSB, or may be allocated to gunny bag factories, according to established quotas, for making gunny bags and jute fabrics. The most important consumers of gunny bags are two state enterprises: the Provincial Food Bureau which uses them for packing rice, and the Taiwan Sugar Corporation which uses them for packing sugar. In recent years, however, nylon fiber and P.E. bags have replaced jute to a certain extent in the domestic market.

MARKETING CHANNELS OF JUTE



MARKETING OPERATIONS

By marketing operations it means the actual practices of the marketing business. Owing to the diversified nature of the products, marketing agencies, organizations and channels, the marketing operations of one farm product may differ greatly from another. It is both impossible and unnecessary to cover, in this paper, the marketing operations of every agricultural commodity. In this section, therefore, the presentation will center on rice, with occasional supplemental remarks on other crops when it is deemed necessary to do so.

Collection

In an agriculture which is characterized by small farming the collection of farm products from individual farmers to form a marketable economic unit is the starting point of efficient marketing. Generally speaking, agricultural commodities are collected in the assembly market, be it a small village or township in the rural area, or a collecting station established by a local farmers' organization. From the farm to the collecting spots, transportation is handled by the farmers themselves. On rare occasions, transfer of farm produce to the country buyers is completed at the farmyard. Selling on the farm is more common in the case of hogs, poultry and eggs, fruits excepting bananas, oranges and pineapples, and vegetables.

In the case of rice, paddy is usually transported to nearby private operated rice mills or farmers' associations, packed in gunny bags of 60-80 kg each. Transportation is by ox-cart, power tiller or motor truck, depending on the size of shipment and distance. At the rice mill or farmers' association, the formers surrender part of their rice to meet obligations to the government, sell part for cash and leave the balance in the custody of the rice mills for later disposal.

For certain fruits and vegetables, collection is done at specialided collecting and packing stations established by producers' organizations, such as fruit marketing cooperatives and farmers' associations. This is true with export bananas, oranges, onions, mushrooms and asparagus. In the case of pineapples, collection is done at the collecting spots set up by the canners' association, and in the case of other vegetables it is usually completed at local vegetable markets.

Sugarcane collection is handled by the Taiwan Sugar Corporation. The work includes harvesting, transporting to the TSC railroad station and hauling by TSC railroad to its sugar mills, with the necessary expenses borne by the sugarcane

farmers by a pooling method. Sugarcane is weighed and surrendered to the TSC at the sugar mills.

Grade, grading and inspection

Farm products marketed domestically are not subject to mandatory grading and inspection, save for health and hygienical reasons. In order to facilitate packing and subsequent handling and to protect farmers' interest, however, fruits and vegetables are often graded, prior to shipment, mainly according to weight and physical size. In this case, no universal grading criteria have been established either by the government or by non-government organizations. The standard used, therefore, may vary from farmer to farmer, from place to place, and from time to time.

Government rice collected by the farmers' associations and private rice mills must meet certain minimum quality requirements. They are: (1) moisture content not exceeding 13%; (2) unit volume weight 5.32 kg or more per liter; (3) foreign matter not exceeding 0.5%; (4) clean and fresh with full grain and no signs of infestation by insects and pests.

Prior to shipment, agricultural commodities for export are strictly inspected twice by the Bureau of Commodity Inspection and Quarantine according to national standards, once in the producing area and once at the shipping port. Minimum quality requirements for each commodity have been established as the export standard and failures to meet this standard are subject to rejection for export by the government authorities concerned. In the case of bananas, the minimum standard is as follows: (1) 1.5 kg or more per hand; (2) 4-8 hands per carton; (3) 12 fingers or more per hand; (4) 85% maturity for winter crop and 70% maturity for summer crop. In the case of export onions, size grading is based on the diameter of the bulb. There are four grades: (1) extra-large, 10-11.9 cm; (2) large, 8-9.9 cm; (3) medium, 6-7.9 cm; and (4) small, less than 6 cm. Those of grade (3) or above are exportable.

Warehousing

Storable commodities such as rice and preserved foods are kept at the farm house, and at the warehouses of the farmers' associations and at those of the rice merchants. No specialized warehouses have been established and operated for a single farm product on a commercial basis. The Taiwan Sugar Corporation and the Provincial Food Bureau construct or rent warehouses for sugar or rice which they control. Besides, the Taiwan Railway Administration, the Port Authorities at Keelung and Kaohsiung and a number of commercial shipping companies have

their own warehouses at the railway stations and wharfs for warehousing agricultural commodities in transit. While paddy is stored in bulk, brown rice, polished rice, other coarse grains and sugar are packed in gunny bags while in storage.

Perishables are stored in the cold rooms attached to ice-cube making plants. There are a few refrigeration plants without ice-cube making facilities which offer cold storage services. The refrigeration plant of the Provincial Farmers' Association is one of the specialized cold storage warehouses. Some fruit and vegetable merchants keep perishables in cold storage warehouses, waiting for profit opportunities. When stored in such warehouses, perishables are usually packed in containers such as wooden boxes and bamboo baskets.

Processing

To a varying extent, processing changes the form of a commodity. Before World War II processing of rice for farmers' home consumption was usually done manually or by animal power. At present, however, hand-pounding of rice is rare in rural areas. Equipped with roller-type rice huller, private rice mills and the FA rice mills hull paddy into brown rice which is more convenient for transportation. The recovery rate of brown rice from paddy is about 80% in weight, that is 100 kg of paddy yields about 80 kg of brown rice after husks are removed. With screw type rice polisher, the rice mills grind the brown rice with a recovery rate of about 90-94%, depending on the quality of grain and degree of polishing. The farmers usually get the rice needed for home consumption processed by nearby rice mills. While most rice mills in the rural areas are equipped with both rice hulling and polishing machines, those in large cities have only polishing machines. The by-product of hulling, rice husk, is used for fuel or compost making and that of polishing, rice bran, is used for feed and oil extracting purposes.

Perishable farm products are mainly processed into canned form, although some are also found in dried, sugar- or salt-preserved forms. Canned mushrooms, asparagus and pineapples are the major canned perishables appearing in foreign markets, although other canned products such as oranges, bamboo shoots and water chestnuts have been produced in increasing quantities in recent years. Freezing, a technique now used mainly in meat and vegetables processing may find itself useful and popular in the processing of perishables in the future.

Sugarcane is processed into refined sugar through the centrifugal process or into crude sugar by a rather primitive method. Sweet potatoes are sun-dried and processed into sweet potato chops or starch. The processing of sweet potatoes remains largely a cottage industry.

For processing of govenment rice, the rice mills receive fees from the Provincial Food Bureau at the following rates. The recoveries over these rates virtually belong to the processor.

(1) Hulling of paddy into brown rice, Japonica, NT$4.78 per 100 kg of brown rice,
Indica, NT$5.47 per 100 kg of brown rice,
with all by-products retained by the processor.

(2) Polishing of brown rice into white rice, NT$7.00 per 100 kg of brown rice, with all by-products recovered by the PFB.

Transportation

Between farm and local market, transportation is usually done by ox-cart which may carry up to 1,000 kg. In recent years, use of power tillers as a means of transportation has become increasingly popular. If the size of shipment is quite large, or the distance of travel long, the service of a motor truck may be called for. In mountainous areas not yet accessible by highway, transportation depends on manpower.

Between local and terminal markets, transportation is by either motor trucks or railways. While the latter means of transportation is good for long hauling and large shipment, the former has the advantage of direct shipment, easy loading and unloading without any need of transshipment. High mobility is another advantage of truck hauling. These advantages have made truck hauling grow at a faster rate than railway freight transportation.

The government-operated railway system offers preferential freight rates for the shipment of foods. Despite the extra cost of transportation to the loading station and from the terminal station, shipping of rice by rail is much less expensive than by highway, if the distance is a long one.

Transactions

Transactions of farm commodities are in general completed through price negotiations by the parties concerned. In the case of perishables, sometimes the transactions are made on the standing crop before harvest. This practice is often found when the farmers are in need of cash, or when they do not want to assume the entire risk of production but it has become less common in recent years. If the harvest is not sizable enough to warrant shipment to the market place, or if the farmer has other commitments, transactions may be completed at the farmyard, after negotiation on the terms of transaction. Where there is a market easily

accessible to the producers, transactions are usually completed in the market. Some markets allow price negotiations between the seller and the buyer, while others offer auction sales. In the Taipei Livestock Market, transactions are completed indirectly, in which arrivals are all transferred to the market authority and the buyers buy the hogs from the market by drawing lots. In other markets, commission agents may represent either party in a transaction.

In a preharvest transaction which is now rare, a warranty deposit may be paid to the producer by the buyer with the balance of the price to be paid upon the transfer of the commodity. In some cases, however, part or all of the payment may be deferred until some time after delivery of the commodity.

Marketing Facilities

For the marketing of farm products, certain facilities are necessary. Some of the marketing facilities are social overheads or infrastructures such as highways, railroads, retail markets and harbour facilities, while others are capital investments in agriculture.

For storing their rice, farmers often construct granaries of a simple design. By and large, all private rice mills are provided with warehouses of varying capacities. However, the most important grain warehouses are found in the farmers' associations. FA granaries are usually brick or reinforced concrete buildings with efficient ventilation. Some FAs also have rice, corn, wheat and peanut seed granaries of special designs.

Rice processing machines, including rice huller and polisher, are of necessity the major facilities of both private and FA rice mills. Roller-type hulling machines and screw-type polishing machines of different horse power are their main equipment. Some local FAs and factories are also equipped with corn shellers, peanut huskers and other equipment.

Collecting and packing stations are the important facilities related to export products such as oranges, pineapples, mushrooms, asparagus and onions. Most of these facilities belong to farmers' organizations.

Two county farmers' associations operate silk reeling plants and the Provincial FA, a cold storage and a milk bottling plant. There are many canneries, milk bottling and processing plants, sugar mills and other processing factories. Table 14 in the following page presents the statistics on the important marketing facilities in Taiwan.

TABLE 14

Important Marketing Facilities in Taiwan, 1969

Item	Number	Capacity
Rice warehouses (FA)	1,183	493,125 m/t
Rice warehouses (private)	209	150,909 m/t
Seed & other warehouses (FA)	762	150,000 m/t
Rice mills (FA)	429	9,296 m/t of brown rice
Rice mills (private)	209	4,047 m/t per 10 hour day
Peanut husking mills of FA	7	300 m/t of kernel peanut per day
Asparagus collecting stations (FA)	150	18,350 m/t
Mushroom collecting stations (FA)	501	30,462 m/t
Onion packing stations (FA)	8	400 m/t per day
Banana packing houses	368	308,000 m/t a day
Orange packing houses	26	100 m/t a day
Cold storage plant of PFA	1	300 m/t
Sugar mills (Centrifugal)	22	57,200 m/t per day
Vegetable markets	60	
Livestock markets	14	

Financing

In marketing any commodity, financing is needed not only for the movement, transfer and processing of the goods in question, but also for the construction of physical facilities and operation expenses. The marketing agencies and producers all need financing to carry on their marketing business.

Producers of many farm products receive loans advanced by credit institutions such as farmers associations, the Cooperative Bank and Land Bank of Taiwan, by non-credit institutions such as the Provincial Food Bureau, the Provincial Supply Bureau, the Taiwan Sugar Corporation, and by private sources such as country buyers and processors of all kinds. These loans are usually called production loans. In addition to enabling the producers to refrain from selling immediately after harvest when prices are at the lowest, these loans also help them perform important marketing operations. Even fertilizer loans to rice farmers are somewhat related to marketing.

Construction of physical marketing facilities such as collecting and packing houses, warehouses, rice mills and other processing facilities is financed partly from

internal sources and partly by loans from external sources. To the producers' co-operatives, external financing comes from the Farmers Bank, the Cooperative Bank, the Land Bank, the Joint Commission on Rural Reconstruction, the Provincial Food Bureau, and the Provincial Supply Bureau, and to the commercial marketing agencies, external financing comes from commercial banks. The Farmers Bank of China, the Cooperative Bank of Taiwan, the Land Bank of Taiwan, PFB and PSB in turn depend upon the Bank of Taiwan for refinancing.

Financing is also provided for the procurement of packing materials, especially if such materials cost large amounts of money and must be procured long before shipment as in the case of export. All the three agricultural bank, namely, the Farmers Bank of China, the Land Bank of Taiwan, and the Cooperative Bank of Taiwan, provide this kind of financing.

When the commodities are being moved through the marketing channels, the producers need financing because the market prices have not yet been paid by the consumers. When the commodities are being transformed through processing operations, financing is needed for the same reason. This is also true. when the goods are in storage. Financing of this sort may come from internal sources, such as the capital of the marketing agencies. In most cases, however, external sources are more important in such financing.

EXPORT TRADE

Like all island economies, Taiwan depends heavily on external trade for her economic growth and prosperity. For the development of the national economy, she needs capital, and for meeting the requirements of industrial production, she needs raw materials. With limited capital accumulation and resources endowment, she relies heavily on agricultural exports for foreign exchange to pay for the imports of capital goods, raw materials and modern technology. This is true at least in the early stages of economic development. It is therefore conceivable that export trade is an important concern of agricultural marketing.

The export trade of developing countries is largely mono-cultural in nature, meaning that it is dominated by a few items. This is true for most, if not all, of the tropical and sub-tropical countries. Taiwan's export showed the same trend until a few years ago. It was tea that claimed the lion's share of export up to the first decade of this century. Then rice and sugar became dominant. Presently, processed foods such as canned fruits and vegetables, sugar and bananas are the major items of agricultural export. However, other perishables such as oranges and fresh vegetables have been growing in importance.

Details of the agricultural export of Taiwan in the last several years are presented in Table 15. From this table, it is clear that agricultural commodities, both primary and processed, account for 24% of the total export in 1970. The percentage of agricultural export in the total export, however, has been decreasing, especially during the last two years. In 1960 for instance, it was as high as 71%.

For most of the years under observation, sugar and banana were the most important items among agricultural exports, surpassed only by fisheries products in 1970. In recent years, canned mushrooms and canned asparagus have gained rapidly, and now export of canned foods inclucing mushrooms, asparagus and pineapples earns almost US$100,000,000 annually. If other preserved fruits and vegetables and canned products are grouped together as preserved foods, then preserved foods, sugar, fisheries products and fresh fruits including bananas, pineapples and oranges are the four pillars of Taiwan's agricultural export.

There have been rises and falls for individual items of agricultural export in the last decade. While some new items came into being and grew, some other items faded and almost disappeared. Previously rice was a very important foreign exchange earner, but in recent years it has ceased to be a significant export item. Export of bananas increased rapidly during the first half of the past decade and it hit the

TABLE 15

Agricultural Exports of Taiwan, 1962-1970

(US$1,000)

Item	1962	1964	1966	1968	1970
Primary Ag. Products	40,744	80,744	124,080	127,701	161,549
Rice	7,380	18,030	32,967	13,930	2,594
Bananas	8,041	33,344	52,063	57,168	38,149
Citronella oil	5,226	4,853	3,064	1,721	3,689
Vegetables	3,436	6,511	7,650	23,579	28,762
Bamboo shoots	2,282	2,454	3,164		
Pineapples, fresh	4	35	2,802	5,840	10,530
Other fruits, fresh	1,871	2,322	2,369		
Sisal, ramie and hemp	3,914	2,357	2,610	2,560	550
Feathers	1,758	2,402	2,485	3,312	3,778
Hog	2,184	237	226	524	1,276
Sea products	731	2,192	7,435	13,095	59,487
Medical herbs	417	440	517	478	961
Tobacco	1,792	1,008	2,779	1,137	2,273
Others	1,708	4,559	3,369	6,500	9,500
Processed Ag. Products	88,389	195,444	161,850	176,878	214,979
Sugar	49,588	135,403	61,708	50,772	47,554
Tea	7,859	8,426	11,116	11,681	14,284
Pineapples, canned	10,859	13,911	19,307	18,974	20,153
Mushroom, canned	8,508	15,817	25,251	32,320	33,646
Fruits, preserved	2,022	6,180	6,361	9,091	13,588
Camphor	475	1,142	722	3,700	1,915
Peppermint	2,617	676	578		
Log and Timber	5,384	12,178	20,604	25,000	45,000
Bamboo products	1,077	1,300	1,985		
Asparagus, canned	—	411	14,218	25,340	33,339
Others				1,500	5,500
Total Agricultural Export	129,133	276,188	285,930	304,580	376,528
Total Export	238,609	463,110	569,426	841,775	1,561,652
% of Agricultural in Total	54.12	59.64	50.21	36.18	24.11

Source: **Export and Import Exchange Settlements for the Years 1962-1970,** Bank of Taiwan.

peak in 1967 but since then it has been on the decline. Citronella oil and fiber crops have lost much of their international market in recent years. Quantity-wise,

sugar export has been quite stable. But value-wise, it has fluctuated with the sugar price in the international market.

There are some items the export of which was started from scratch hut now has reached the number one position in the world market. Canned mushrooms and canned asparagus are the cases in point. Mushroom growing was successfully introduced about 15 years ago. Since then, export of canned mushrooms has soared and now the annual export value of this product amounts to over US$30 million. The growth of asparagus export is much more phenomenal. Until 1962, there was no canned asparagus export at all. The export of this item started in 1963 and earned a meager US$4,000 that year. But in 1970, its export value also exceeded US$30 million. There are some other items which were imported previously, but now have turned into export items themselves.

The agricultural export has been diversified considerably during the past two decades. Previously, it consisted of only a few items such as rice and sugar. There were times when sugar and rice combined accounted for about 80 percent of total agricultural export. But now these two items together share only less than 14 percent of the total. The diversfication index of agricultural export increased from about 2.0 in 1950 to 10.0 in 1970. (Table 16).

TABLE 16

Diversification Indices of the Agricultural Export of Taiwan

Year	Diversification Index	Year	Diversification Index
1952	2.4	1961	4.1
1953	1.8	1962	5.7
1954	2.3	1963	3.8
1955	2.7	1964	3.7
1956	2.2	1965	7.4
1957	1.9	1966	8.5
1958	2.6	1967	9.3
1959	3.2	1968	9.7
1960	2.5	1969	10.0
		1970	10.6

Note: The diversification index is calculated according to the following formula:

$D_i = 1/\sum (X_i/T_a)^2$ where D_i = Diversification index

X_i = Export value of product i

T_a = Total agricultural export

The major export markets of Taiwan's agricultural commodities are Japan, U.S.A., and West Germany. The dependence on the Japanese market is especially significant. Until about five years ago, about 50 percent of the agricultural export went to Japan. In recent years, this percentage has declined to about 35 percent. Because of geographical proximity, the Japanese market likely to have the lion's share of our export in the future. Ranking second now is the United States, although the share of this market is much smaller, only about 15 percent. Sharing a little less than 15 percent, West Germany ranks third in the export list. While the Japanese market absorbs most of the primary or non-processed agricultural products, the U.S. and West Germany import mostly processed foods. Other important export markets are Korea, South Vietnam, Morocco, Hongkong and Singapore.

It is quite possible that agricultural exports from Taiwan will continue to increase in the years to come, and the relative share which agriculture maintains in the total export will continue to decline. Due to the relatively high income elasticity of demand, perishable products such as fresh fruits and vegetables, and processed foods such as canned and frozen fruits and vegetables will gain more weight in the agricultural export of Taiwan. More emphasis will be placed on markets other than Japan.

COOPERATIVE MARKETING

It goes without saying that cooperative marketing effectively improves farmers' economic welfare by strengthening the collective bargaining power. This is especially true in a small farm economy. The endeavors made to promote cooperative marketing of farm products, to be sure, have been one of the most important factors contributing to the rapid growth of Taiwans agriculture in recent years.

For some agricultural commodities, the entire marketing process from colletion to export is handled cooperatively. For others, however, cooperative marketing covers only the activities at the assembly end. Bananas, oranges and fresh pineapples are typical examples of the former and mushrooms and asparagus represent the latter.

For the cooperative marketing of agricultural commodities, a system of specialized, single-purpose cooperatives, i.e. fruit marketing cooperatives, and a system of multi-purpose cooperatives, i.e., farmers' associations, are operating in Taiwan. They are described in some detail as follows.

Fruit Marketing Cooperatives

Organization

At present, there are six fruit marketing cooperatives operating at Yilan, Hualien, Taipei, Hsinchu, Taichung and Kaohsiung. In addition, there is a Federation of Fruit Marketing Cooperatives located in Taipei.

The members of a cooperative elect from among themselves member-representatives who meet at least once a year. The member-representatives assembly is the policy-making body of the cooperative which elect a number of directors and supervisors to form the boards of directors and supervisors. The board of directors which meets at least once a month is the body that executes the policies laid down by the member-representatives assembly while the board of supervisors is authorized to inspect and audit the books, accounts and the financial condition of the cooperative. Both boards are responsible to the assembly.

The numbers of member-representatives, directors and supervisors usually determined by the size of membership. The Kaohsiung Fruit Marketing Cooperative has 104 member-representatives, 21 directors and 7 supervisors. For the Taichung cooperative, the respective members are 100, 21 and 7. The term of office

of directors is three years, that of member-representatives two years, and of supervisors one year. All the officers are eligible for reelection.

Membership

The six fruit marketing cooperatives have an aggregate membership of 122,085 persons. In terms of the size of membership, the Kaohsiung cooperative ranks first with 60,689 and the Taichung cooperative follows with 43,675. The Hsinchu cooperative has a membership of 9,204, Taipei cooperative, 5,135, Yilan cooperative 2,830 and the smallest one, the Hualien cooperative, has only 546 members.

Since the fruit marketing cooperatives are single-purpose cooperative societies specializing primarily in the marketing of fruits, only those persons who grow fruits are eligible for membership. This limitation is consistant with the open-door policy of the cooperatives, because those who do not grow any fruit have no need to participate. In the case of the Kaohsiung cooperative, membership is further limited to those who grow at least 0.1 hectare of any kind of fruit and are 20 years of age or older.

The qualifications for condidates for the various offices of the same cooperative are stipulated as follows:

1. Qualifications for member-representatives:
   a. Those who have participated in the cooperative for at least 2 years;
   b. Those who have subscribed to at least 10 shares of the capital stock of the cooperative;
   c. Those who grow fruits on at least 1 hectare of upland of 0.5 hectare of paddy land; and
   d. Those who delivered at least 3,500 kg. of fruits yearly to the cooperative for cooperative marketing during the last two years.
2. Qualifications for directors and supervisors:
   a. Those who have been members of the cooperative for at least 3 years;
   b. Those who have subscribed to at least 20 shares of the capital stock of the cooperative;
   c. Those who grow fruits on at least 2 hectares of upland or 1 hectare of paddy land; and
   d. Those who delivered at least 7,000 kg of fruits yearly to the cooperative for cooperative marketing during the last 3 years.

Similar qualifications apply to the members and officers of the Taichung cooperative. For some cooperatives, however, there are no such requirements for the qualification of members and elected officers.

Business and Service Activities

1. The fruit marketing cooperatives, as the name implies, are engaged in the marketing of fruits. Actually, their major business is the marketing of bananas and oranges, the two most important fruits in Taiwan. Because of the geographical distribution of fruit production in this province, however, the main line of business of some cooperatives is somewhat different from that of others. For instance, Yilan, Taipei and Hsinchu cooperatives specialize in oranges, and Taichung and Kaohsiung cooperatives in bananas.

For the collection, inspection, grading and packing of bananas and oranges, the Taichung Fruit Marketing Cooperative has built 100 packing houses scattered in the fruit producing areas. Farmers bring bananas and oranges to the nearby packing house, and after inspection and grading, the exportable bananas are packed in carton boxes, each weighing 16 kg net. Non-exportable bananas may be handled thereafter in bulk. Transportation to the port of departure for export and to the fruit markets in domestic consumption centers is also handled by the cooperative. Bananas for export are sold to the exporters at the port, and those for domestic consumption are consigned to the dealers at the wholesale market. The Kaohsiung Fruit Marketing cooperative owns and operates 289 packing houses.

The cooperatives in northern Taiwan operate a total of 27 orange packing houses distributed in producing centers. Sixteen of them are modern packing houses equipped with waxing machines. The major part of oranges handled by the cooperatives are for export. For export oranges, waxing and wraping are done before they are packed in wooden boxes, each weighing 20 kilograms net. Part of them are exported directly by the cooperatives, and the rest by exporters.

The pooling method is employed in making payments to the members. Thus, a farmer receives neither the price of his particular lot of delivery, nor the price of the specific date on which delivery is made. Instead, the settled price is the average price of a certain period, or the so-called pooling period. Of course only the prices for fruits of the same quality are pooled together. The fruit growers usually receive payments in a matter of days after delivery.

Tables 17 and 18 show marketing activities conducted by the marketing cooperatives in the past 14 years.

TABLE 17

Banana Exports of Taiwan by Origin

Unit: Basket, 48 kg. net, before 1968
Case, 16 kg. net, after 1969

Year	Kaohsiung	Taichung	Hsinchu	Hualien	Taipei	Yunlin (PFA)	Total
1958	325,103	550,154					875,257
1959	487,819	494,877					982,696
1960	640,201	373,229					1,013,430
1961	903,779	690,104					1,593,883
1962	967,040	231,803					1,198,834
1963	1,073,145	190,398					1,263,543
1964	3,142,726	990,977	5,534			47,800	4,187,037
1965	5,430,591	1,467,029	17,428	3,003	197	112,498	7,030,746
1966	4,920,412	2,548,708	58,444	20,781	219	164,186	7,712,750
1967	6,220,478	2,484,518	71,941	12,180	677	101,277	8,891,071
1968	5,850,910	2,088,402	46,879	161	147	44,453	8,030,952
1969	20,807,662	5,060,506	98,197	—	14,157	125,291	26,105,813
1970	11,818,244	3,183,768	25,020	835	505	105,574	15,133,046
1971	19,008,820	1,728,235	8,442	221	1,062	16,340	20,763,120

TABLE 18

Orange Exports of Taiwan by Destination

Unit: Box, 20 kg. net

Year	Ryukyus	Hongkong	the Philippines	Singapore	Korea	Canada	Total
59/60	317	1,651	15,000	79,358	9,414		105,741
60/61	5,156	36,166	19,984	155,548	3,435	3,154	223,442
61/62	5,033	24,380	12,443	172,471		15,802	230,129
62/63	24,153	52,980	8,000	173,945		1,527	260,605
63/64	54,448	49,398	7,200	189,680		8,499	309,224
64/65	42,487	93,377	8,788	102,122		11,413	358,187
65/66	75,896	84,119	6,609	171,150		4,716	342,490
66/67	83,729	160,353	13,200	85,800		6,681	349,763
67/68	103,614	288,556	18,685	64,487		18,913	494,255
68/69	146,881	254,807	35,249	118,319		3,523	558,868*
69/70	102,534	420,662	28,904	128,685		1,186	699,470*

* Eport to Japan are included in the total.

2. As there is a close relationship between production and marketing, the improvement and increase of fruit production is a matter of great importance to

these cooperatives. All fruit marketing cooperatives have an agricultural section staffed with personnel specializing in agriculture and horticulture. Technical guidance on such matters as proper use of fertilizers, effective control of diseases and insect efficient method of picking and handling fruit, etc. is provided to the members by the technicians of the cooperatives.

Production materials, except fertilizers which are distributed by FAs, such as pesticides, insecticides, sprayers and seedlings are supplied by the cooperatives to their members. Supply of these requisites at reasonable prices together with the technical guidance enables fruit producers to grow quality fruit and raise their income.

Production loans are also made by the cooperatives to needy members from funds made available by the government. Timely and sufficient loans have contributed much to keeping the members from usury exploitations and also to encouraging them to deliver their harvest direct to the cooperatives.

Financing

Since all fruit marketing cooperatives are private organizations, they are privately financed. Though their finacial structure is quite complex and varies from one cooperative to another there are broadly three sources of financing. The first is the paid-in capital, or the stock shares subscribed to by the members; the second is all kinds of reserves; and the third is borrowings and payables. The first two sources are in the nature of internal financing and the third one, external financing.

The major assets of the coopeatives are also of three categories. The first kind is cash and cash equivalent, which include cash on hand, deposits at banking institutions, accounts receivable and prepaid, etc. The second is stocks of commodities including farm products in transit and packing materials, and the third is fixed assets including land, office buildings and packing and collecting houses. Table 19 shows the balance sheet of the Kaohsiung cooperative, as of December 31, 1967.

Table 20 is the income statement of the Kaohsiung cooperative, covering calendar year 1967. It can be seen that the most important item of income was the handling charges which the cooperative received for rendering marketing services to its members. This tiem alone accounted for some 80% of the total income for the year under observation. The largest item of expenditure was handling costs. Which constituted about 63% of the total outlay, leaving the balance for administrative and other incidental expenses. This cooperative made a nominal net profit of about NT$1.25 million, only about 0.4% of its total income.

TABLE 19

Balance Sheet, Kaohsiung Fruit Marketing Cooperative

December 31, 1967

Assets		Liabilities	
Cash	29,415	Payables	16,996,591
Deposits	66,321,779	Borrowings	30,000,000
Accounts prepaid	13,567,023	Temporary receipts	32,231,640
Advances for other cooperatives	30,959,486	Temporary receipts for others	57,492,087
Packing materials	23,051,624	Pension fund	5,177,573
Loans to other cooperatives	4,000,000	Share stocks	2,373,416
Stocks	5,169,486	Reserves	54,253,917
Federation A/T	1,291,798	Incentive payment reserves	78,195
Securities	4,773,000	Reserves for debt repayment	4,397,302
Land	4,692,467	Welfare fund	114,103
Buildings	33,427,647		
Equipment	8,783,567		
Investments	1,053,350	Surplus	1,247,223
Bond deposits	57,820		
Working capital	292,000		
Total	204,362,047	Total	204,362,047

TABLE 20

Income Statement, Kaohsiung Fruit Marketing Cooperative

January 1—December 31, 1967

Income		Outlay	
Handling charges	234,776,276	Marketing expenses	182,111,183
Financial income	5,877,689	Business expenses	54,295,138
Income from market development fund	49,783,576	Meeting expenses	322,925
Miscellaneous	688,44	Financial expenses	530,579
		Expenditure for extension and reconstruction	2,234,731
		Market development fund	49,283,576
		Surplus	1,247,223
Total	291,125,985	Total	291,125,985

Operational Set-up

The Kaohsiung Fruit Marketing Cooperative is a giant among farmers' cooperatives. It employs 1.400 full-time workers to serve its 60,689 members. In terms of payroll, the Taichung Fruit Marketing Cooperative is much smaller; It employs only 345 full-time workers. The following is the organizational chart of the Kaohsiung Fruit Marketing Cooperative.

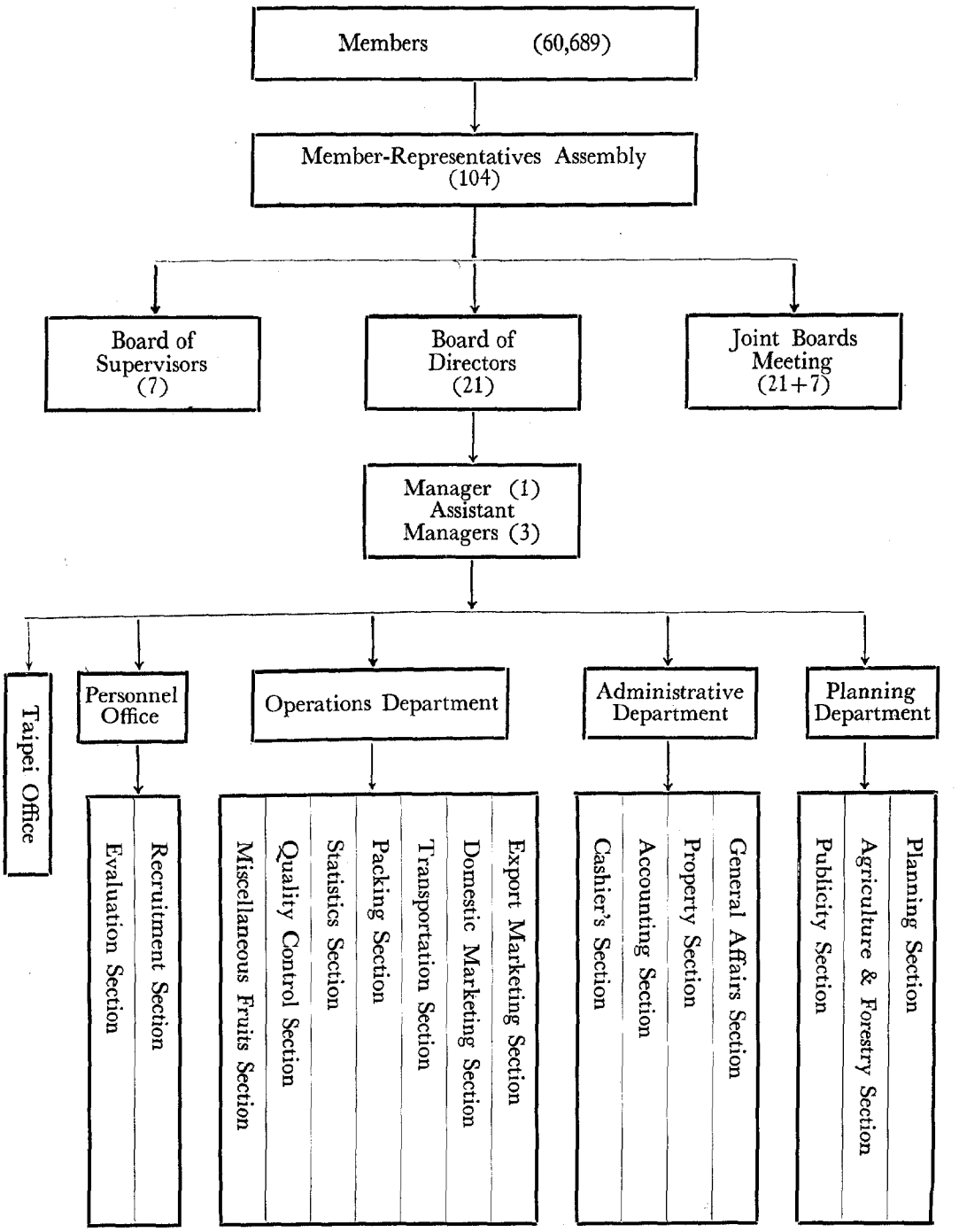
The Farmers' Associations

The farmers' associations in Taiwan are multi-purpose cooperatives which perform a variety of functions to promote the economic and social welfare of their members. Organizationally, they are similar to fruit marketing cooperatives, except that the former are organized within administrative boundaries. The FA membership is open to all farmers regardless of the size of the farms they operate, but only the full-time or bona-fide farmers who derive more than half of their annual income from farming are classified as regular members with voting rights. At present, there are 328 township farmers' associations in Taiwan Province organized on a one-township one-FA basis; 20 prefectural farmers' associations which are federations of the township FAs; and one provincial farmers' association which is the federation of the prefectural organizations. Employing 10,825 full-time workers in total (as of the end of 1970), the FA system renders services related to farm products marketing, rural credit, agricultural extension, livestock insurance and supply of production materials to the farmer members. Rice is the most important product marketed by the FAs either on their own account or in behalf of the government. Of course, rice is by no means the sole item handled through the FA marketing system.

During the past four years, the Provincial Farmers' Association (PFA) has successfully promoted the cooperative export of onion, a new export crop which until a few years ago was imported from Japan in large quantities annually. For this business, the PFA, with the cooperation of the local FAs, has established 8 onion collecting stations, mainly located in the southern tip of the island, where collection, inspection, grading and packing are done by PFA employees. The onions packed in wooden cases containing 20 kilograms each are transported to shipping ports for export by either PFA or exporters.

Another major farm product marketed by the FA is hogs, although domestic marketing is more important than export in this case. Under the overall planning and leadership of the PFA, local FAs collect hogs from the hog farmers and cast them to the assigned markets. At the markets, PFA represents local FAs to com-

ORGANIZATIONAL CHART OF THE KAOHSIUNG FRUIT MARKETING COOPERATIVE



plete transactions, collect and remit the sales proceeds to the farmers. Under this scheme, the pooling method is employed to prorate needed expenses and the farmers receive the payments for their own deliveries minus expenses.

There are some important crops, for which cooperative marketing activities are very limited in scope. Mushrooms and asparagus are examples. To facilitate deliveries by the growers and collections by the canneries, the farmers' associations have set up a number of collecting stations to which farmers bring their products. Under the supervision of the FA personnel, the deliveries are graded and shipped to the canning factories immediately. Besides participating in the collective negotiation of prices to be paid to the farmers, FAs play an important role in the acreage allotment and technical guidance on growing these crops. In the marketing operations, however, the FA's role is limited to facilitating collection, the initial stage of marketing.

Being multi-purpose cooperatives, the farmers' associations have an interest in the marketing of many other crops. For jute, the most important fiber crop, collection and storage are done by FAs. For vegetables, fruits and hogs, FAs operate markets to facilitate transactions between the buyers and sellers. In the case of poultry and eggs the PFA marketing service covers the whole marketing process, although the market share enjoyed by the FA cooperative marketing

TABLE 21
Cooperative Marketing of Hogs by Earmers' Associations
(Head)

Year	Domestic Market	Export*
1961	100,186	74,928
1962	92,889	46,299
1963	92,375	15,253
1964	76,963	6,554
1965	80,102	5,691
1966	112,004	6,486
1967	152,164	12,762
1968	140,478	6,107
1969	156,767	45,297
1970	211,331	67,860

* Export of live hogs is handled by the Provincial Supply Bureau with the animals supplied by the FAs.

Source: Taiwan Provincial Farmers' Association.

system is still rather insignificant. There are some other crops, the cooperative marketing of which has only local importance.

In the case of rice, cooperative marketing conducted by the FAs is very important throughout the whole island. In the first place, the FAs act as the field agent of the Provincial Food Bureau in the collection, storage and processing of rice. In the second place, they conduct buying, selling, storage and processing operations for the benefit of the farmers. In the third, the FAs provide warehousing and processing facilities to the farmers for their marketable rice as well as the rice for home consumption. By providing better and more efficient warehousing and marketing facilities, the FAs help their members minimize losses from storage and processing.

PRICING AND PRICES

In so far as pricing is concerned, Taiwan's agriculture is a complex economy. On the one hand, it is a free market economy in the classical sense, i.e., the economy is directed by an invisible force and consequently the price mechanism functions to clear the market. In this sort of economy, supply and demand is equated by the functioning of the price mechanism, at least in a relatively long period of time. On the other, it is to some extent a planned economy in the sense that market prices are highly influenced, if not determined, by government policies, directly or indirectly. In this case, effective supply and demand are no more the sole forces which determine market prices.

Free Market Pricing

For some agricultural commodities, market forces are fully allowed to determine prices and the government has no positive or intentional measures to influence the price levels. This is the pricing of the free market economy in which prices are free to fluctuate and the market is cleared by arbitrage. In this case, the price levels are settled by the interaction between demand and supply or, in a static economy, at the intersection of demand and supply curves. Since demand is considered relatively stable in a short period, the price level is a reverse function of supply, other things remaining constant. This is the case with most agricultural commodities of Taiwan. It is estimated that free market pricing applied to some 60% of the total farm produce in 1971.

Free Market Pricing with Government Stabilization Measures

In an economy where agriculture is the backbone, agriculture offers real and basic opportunity for social progress and economic growth and stability. Farm production should be able to feed the people, with reasonably good diet and enough nutrition at prices accessible to all the consumers. For some farm products, therefore, market prices are fundamentally determined by the free working of market forces, but the government employs some measures to influence prices indirectly. The primary objective of the government measures is to stabilize prices for the consumers, but incentives for the producers to produce more are also taken into consideration. In fact, stable price is different from low price. For this purpose, the government relies more on marketing measures than on price itself, e.g., establishment of official prices.

When excess supply or demand exists, either chronically as a secular trend or temporarily as a seasonal movement or cyclical fluctuations, measures should be employed to influence demand and supply curves either at the farm level or at the retail level, or at both levels. Various kinds of measures are then taken to attain this goal.

Through the streamlining of market organizations, elimination of unnecessary, or duplicate marketing functions, rationalization of marketing practices, modernization of marketing facilities and regulation of supply and demand, government measures can improve marketing efficiency and minimize marketing costs. Reduction of marketing costs will result in lower retail prices and/or higher farm prices. By means of these measures, the government influences price formation only indirectly. The result, however, does not deviate too far from free market pricing. For practically all the farm commodities of Taiwan, pricing is to some extent influenced by government measures of this nature.

The government may directly participate in the marketing of certain farm products, through controlling all or part of the products which flow into the market. Government participation may be aimed primarily at raising government revenue, or at stabilizing market supply and prices, or even at boosting the value of the commodity. The government collection and rationing of rice is a case in point. The pricing of government rice is based on procurement costs of the commodity. Since the government controls about 50% of the marketable rice and the recipients of government rationing do not pay any cash price (they receive rice as part of their salary), government participation in rice marketing tends to influence rice pricing directly.

The government may also undertake market operations to stabilize prices at the retail, wholesale and farm levels. When the effective demand is dull and market price falls, the government may collect, store or export part of the surpluses. By separating the excess supply from the market temporarily or by channelling it to foreign outlets, further decline on market prices may be prevented. When the effective demand is keen relative to available supply with market prices soaring, the government may release its stocks or buy from abroad so as to inject new supplies into the market, thus helping prevent prices from hiking further. To be effective, this practice should be backed up by government purchasing, storing and reselling programs. In Taiwan, government measures of this nature are extensively used to stabilize the market price of rice.

There are some government measures which are designed to influence the sup-

ply curve at the farm level. Technical assistance, financial assistance, provision of quality farming materials such as seed, pesticide, farm machinery and fertilizers, etc. at reasonable prices will provide farmers with non-price incentives and make more supplies available at given market prices. In order to stabilize production and supply, the government may take measures to reduce or maintain production by limiting acreges. In order to avoid retaliatory actions by foreign governments or non-government organizations, acreage allotment schemes for several crops have been established by governments in Taiwan. By influencing the position and shape of the aggregate supply curve at the farm level, pricing is thus indirectly influenced by the government action. While production incentives are provided for most farm products, acegae allotmets are applied to a relatively small number of crops, such as tobacco leaves, mushrooms, and asparagus.

Contract Pricing

Agricultural production is an organic growth process which takes time to complete. From planting to harvest, a certain period of time must elapse, and this requirement of time can not be appreciably reduced even by modern technology. In the case of vegetables, it takes about two months to complete the production process. For most grain crops, about four months is required, and for sugarcane, 12 to 16 months. In the case of perennial fruits, it may take as long as 10 years to complete a production cycle. To a farmer's production plan, prices at the harvest time may be much more important than at planting. Farmers are, therefore, more concerned about prices after harvest than at the planting time.

To facilitate farmer's decision making regarding production investments, it is necessary to eliminate as much as possible the uncertainty of the future prices. This is very often done by setting up contract prices before planting, agreed upon by both parties concerned, to be applied when the product is ready for the market.

An example of contract pricing is that practised on mushrooms and asparagus. Prior to the planting season, the government prepares a production plan for these crops and allots a planting acreage to each township and a canning quota to each cannery. In the designated raw material procurement area, the cannery signs, in the presence of the local farmers' association, raw material purchase contract with the growers at prices agreed upon in advance. In determining the prices, the farmers' association which represents growers, and the canners' association which represents canners, bargain collectively with the government authorities concerned acting as arbitrators. The contract is signed between individual farmers and canners before planting and the contract price is applied when the harvest is delivered

to the collecting stations. Contract pricing is applied also to some other crops, such as jute, with some minor modifications.

Although no formal contract is signed between producers and processors of pineapples, a kind of contract pricing is employed by the pineapple canneries in the procurement of raw fruits. Since pineapple is a perennial crop, contract pricing before planting is impracticable. For this reason, the canners' association determines and announces, before each harvesting season, the price for the forthcoming crop of raw pineapples.

Since the producers are not obliged to deliver any crop to the cannery at this price, it is not a contract price in the formal sense. However, since the canneries will accept any deliveries at the announced price and since the growers are willing to make deliveries at this price despite the existence of alternative outlets, this practice may be considered as a form of contract pricing.

Sugarcane offers another example of contract pricing of a little different content. To encourage contract farmers to grow more sugarcane, the Taiwan Sugar Corporation announces, prior to the planting season, the price at which TSC will buy the farmer's share of sugar. This price is based on the production costs of sugarcane plus net profit obtainable from competing crops and is announced before actual planting of sugarcane. This is a minimum price rather than a fixed price. When the sugarcane is harvested, the contract farmers may either sell his share of refined sugar to the TSC at the posted price or sell it to dealers at the market price. The posted price of the TSC is based on export price and it may be higher than the contract price but never lower. It is therefore sometimes called support or guaranteed price. The minimum price applies only to the sugar which the grower shares, not to the sugarcane.

Except for sugar, the contract price does not guarantee the exact price payable to the farmers. When the supply is abundant, grading and inspection by the canneries may be more strict and the average price paid to the growers tends to be lower. When the supply is insufficient, the opposite tendency occurs. However, the contract pricing scheme helps reduce uncertainties to the minimum and thus facilitate farmer's production planning.

Official Pricing

Based on the production cost survey on rice, an official price for rice is announced by the Provincial Food Bureau every season. This price is applicable to:

(1) Calculation of payments for rice compulsorily purchased from owners of

paddy-land;

(2) Conversion of land tax in kind into cash for upland and single-cropping paddy land yielding only one crop of rice annually (for the latter kind of land, land tax is paid in kind for half a year and in cash for the other half of the year);

(3) Settlement of accounts between food and tax authorities; and

(4) Settlement of accounts between food authorities and other government agencies regarding rice rationing.

The rice transactions in the free market are not subject to the official price. And since the official price is as a rule 20% to 30% lower than the free market price, it does not function as a support price. The official price of rice, consequently, does not have much bearing on the price formation of free market rice.

Prices

Farm price is a complex subject. In this section, only the prices of rice are dealt with briefly as an illustration.

Table 21 presents chages in the farm price of paddy, the wholesale price of polished rice, and the retail price of polished rice in the last 15 years. As of May 1972 these prices were at the following levels:

Farm price of paddy	US$13.16 per 100 kg
Wholesale price of brown rice	US$17.50 per 100 kg
Retail price of polished rice	US$ 0.189 per kg
Official price of paddy	US$11.00 per 100 kg

During the past 10 years, rice prices have remained relatively stable, mainly due to the effectiveness of the government food control measures. This is true in comparison with other farm prices and non-farm prices. However, rice prices in terms of local currency have almost doubled in the last ten years. For instance, farm price of paddy was NT$217.90 per 100 kg in 1956, and it increased to NT$526.00 per 100 kg in Feb. 1972. The retail price of polished rice was NT$3.42 per kg in 1956 and it was NT$7.90 per kg in Feb. 1972. The wholesale price and even the official price showed the same movement.

When all rice prices are converted into prices of brown rice equivalent, the results are shown in Table 23. A brief examination of this table reveals two facts: One is that prices at farm, wholesale, and retail levels are very close; and the other is that, except 1960 and 1961, export price is higher than wholesale price on the

TABLE 22

Annual Average Price of Rice in Taiwan

(US$/M.T.)*

Year	Farm Price of Paddy	Wholesale Price of Polished Rice	Retail Price of Polished Rice
1956	87.93	128.22	137.88
1957	94.42	135.92	146.62
1958	67.29	96.01	103.08
1959	70.98	102.32	109.03
1960	105.29	145.44	151.18
1961	102.26	145.18	149.47
1962	94.25	136.71	147.39
1963	97.93	139.95	147.55
1964	101.84	144.70	147.96
1965	102.75	145.95	148.80
1966	103.52	147.89	150.04
1967	109.99	155.47	157.52
1968	116.15	161.78	167.08
1969	112.80	162.30	173,52
1970	122.08	177.10	182,30

* Exchange rate: 1956-57, US$1.00=NT$24.78
1958-59, US$1.00=NT$36.38
1960-61, US$1.00=NT$40.03
1962-70, US$1.00=NT$40.10

Source: **Rice Review** Joint Commission on Rural Reconstruction **Industry of Free China** Council for International Economic Cooperation and Development.

domestic market but the difference is small. The first finding indicates that marketing margins are very small in the domestic market, and the second may suggest that rice export can hardly be a commercial venture. However, the conclusions drawn from annual average prices may be misleading in that many details are removed by the averaging process. These average prices are useful only as rough indicators.

The relative movements of agricultural and non-agricultural prices of the last 15 years are compared by means of price indices in Table 24. Using 1952 as the base period, the general index of wholesale prices in Taipei reached 231 in 1968, while agricultural price index reached 300 in the same year. During this period, agricultural prices were rising more rapidly than most of the non-agricultural prices. In fact, all agricultural price indices (group indices) were rising more rapidly than

general wholesale price index during the same period. Abstracting all complexities of index numbers, agricultural prices have been the leading factor in the inflationary movement of prices during the past one and a half decades.

TABLE 23

Farm, Wholesale and Retail Prices and Export Unit Value of Rice
(US$ per metric ton)*

Year	Farm Price		Wholesale Price	Retail Price	Export Unit** Value
	Official	Market			
1956	82.61	115.82	119.25	128.24	138.66
1957	86.32	124.05	126.23	136.36	133.82
1958	63.61	88.29	89.28	95.82	91.12
1959	66.77	92.96	95.22	101.40	132.79
1960	73.44	125.58	122.93	127.78	119.26
1961	91.13	134.20	135.05	139.15	131.08
1962	94.26	123.47	126.96	136.83	132.27
1963	96.21	128.50	130.15	137.36	133.72
1964	98.18	133.64	134.56	137.61	141.89
1965	100.80	134.84	138.23	138.38	145.47
1966	103.19	135.86	137.53	139.45	163.90
1967	103.19	144.34	144.59	145.19	155.25
1968	115.84	151.52	150.45	155.54	—
1969	122.07	147.13	150.02	160.42	—
1970	129.43	159.25	163.71	168.33	—

* In terms of brown rice or equivalent.

** Exchange rate: Same as in Table 22. Conversion rate from brown rice to polished rice is 91%.

Source: Other than export unit value, JCRR **Rice Review**
Export uoit unit value: Compiled from **Statistics of Trade,** Inspectorate-General of Customs; and **Taiwan Food Statistics,** Taiwan Provincial Food Bureau.

TABLE 24

Agricultural Price Indices

Year	Wholesale Price Index in Taipei	Agricultural Price Index	Crops						Livestock Products	Forest Products	Fishery Products
			Group Index	Rice	Other Food Crops	Special Crops	Vegetables	Fruits			
1953	108.8	117.4	116.8	126.3	118.6	130.6	111.7	99.4	113.4	135.0	108.8
1954	111.3	123.4	120.8	119.7	120.1	122.7	129.8	112.6	117.0	148.4	120.1
1955	127.0	147.1	146.9	131.9	147.9	164.2	157.5	135.8	141.2	169.8	133.6
1956	143.2	165.7	151.9	138.4	160.1	153.6	160.7	148.2	158.5	256.6	172.9
1957	153.5	172.6	162.5	149.7	168.6	163.8	166.2	164.9	172.0	265.7	152.4
1958	155.6	183.3	179.4	153.6	184.4	158.0	233.9	177.6	175.7	261.0	149.4
1959	172.5	211.0	208.1	183.0	203.4	186.2	263.0	214.3	211.9	250.9	189.5
1960	196.9	241.7	240.0	236.6	246.9	217.3	286.7	219.3	260.2	264.1	212.9
1961	202.2	239.0	248.8	245.5	251.3	233.6	299.8	220.9	262.6	222.3	191.4
1962	209.4	239.3	257.9	241.0	257.3	252.0	304.5	239.9	269.6	219.6	159.6
1963	223.0	254.8	276.7	252.6	276.2	266.3	295.4	296.0	283.8	227.9	169.5
1964	228.5	268.1	291.0	256.0	287.8	327.0	299.9	288.9	307.0	231.5	180.3
1965	217.9	270.5	283.2	259.5	313.7	279.3	349.3	240.0	306.8	279.0	184.9
1966	221.1	280.1	287.1	263.1	314.2	285.1	373.7	226.3	300.0	337.6	193.6
1967	246.6	382.6	287.8	281.3	319.4	267.0	386.8	217.9	294.4	353.9	198.1
1968	231.2	300.0	302.3	295.4	312.7	282.5	388.3	258.3	309.3	402.9	209.5
1969	229.4	297.7	301.7	294.1	287.4	301.1	452.6	231.1	294.9	397.8	220.2
1970	238.0	313.5	320.3	312.0	320.0	320.5	369.8	299.4	297.1	406.2	230.9
1971	—	306.4	300.3	311.5	311.3	311.4	365.4	226.2	327.7	394.4	247.4

Notes: 1. 1952=100.0

2. *Source:* Department of Agriculture and Forestry, Taiwan Provincial Government; **Taiwan Agricultural Price Monthly** February 1972.

COST AND MARGIN

Marketing cost and marketing margin are often considered equal or even synonymous, since the former represents the value added by marketing activities, and the latter represents the difference between price paid by consumers and price received by producers. It may be said that marketing margin consists of the costs incurred by marketing agencies in performing various marketing services. If all marketing activities are operated under the condition of perfect competition, no marketing agency stands to gain windfall profits. What it is likely to receive under this condition is nothing more than normal profit. Whenever there exists any windfall, either positive or negative, marketing margin may deviate considerably from marketing cost, since the latter includes only a normal profit. Cost and margin are equal only when and where the marketing economy is operating under perfect competition. With this qualification in mind, marketing cost and margin are used interchangeably in this chapter.

Marketing cost can be broken down into material, transport and power expenses, wages, taxes, interests, rents, profit, etc. Some of these are fixed elements which are unaflected by changes in business volume; some are variable in nature, changing proportionally with the changes in business volume. The fixed elements in the marketing cost make marketing margin more stable than prices. The comparative stability of the marketing cost causes the farm price to fluctuate more than the retail price. If the farm price is just half of the retail price, the former may fluctuate twice as high as the latter, all other things remaining unchanged.

By and large, the more the fixed elements there are the more stable the marketing cost will be. For instance, fixed elements are an important part of the cost of processing, so the marketing margins for highly processed foods are especially stable. For partially processed or unprocessed products, on the other hand, a large proportion of the margin is made up of variable factors, such as handlers' and dealers' charges, usually calculated as percentages of the original price. Thus, margins for unprocessed perishables vary more with prices.

The actual magnitude of the marketing margin for agricultural commodities is largely determined by the nature of the product and the taste or preference of the consumer as regards services associated with the commodity. Expressed as a percentage of the retail price, or the spread of the consumer's dollar, marketing margins tend to be larger for bulky, perishable products such as fresh fruits and vegetables which are more expensive to handle, transport and store, and for highly processed

goods such as canned fruits and vegetables. For those products which are highly seasonal and localized in supply, marketing margins also tend to be larger.

TABLE 25
Marketing Cost of Rice
(1966)

Item	NT$/100 kg		% of total marketing cost		% of retail price	
1. Farm price of paddy		418.78				66.21
Transportation expenses	6.50		3.04		1.03	
Packing expenses	1.17		0.55		0.19	
Processing expenses	8.00		3.75		1.27	
Processing loss	150.35		70.36		23.77	
Wholesale margin	17.79		8.32		2.81	
Sub-total		183.81		86.02		29.07
2. Wholesale price		602.59				95.28
Transportation expenses	1.81		0.85		0.29	
Packing expenses	0.41		0.19		0.06	
Retail margin	27.66		12.94		4.37	
Sub-total		29.88		13.98		4.72
3. Retail price of polished rice		632.47				100.00
4. Total marketing cost		213.69		100.00		

Source: Wen-fu Hsu: A Study of Agricultural Products Marketing in Taiwan. Published by: Department of Agricultural Economics, National Taiwan University, April 1969, P. 64.

The marketing margins of rice expressed as percentages of retail price are presented in Table 25. This table is compiled from data obtained from a survey made in 1966. According to this table, rice farmers receive 66% of the retail price, with the remaining 34% absorbed in the marketing process. The most important item is processing loss in hulling and polishing, which accounts for 24% of the retail price. The dealers' margins at wholesale and retail levels add up to only 6.18%. The results obtained in Table 25 need some qualification. Customarily, a multiplier of 0.686 is used in Converting paddy into polished rice. This suggests that to obtain 1 kg of polished rice 1.46 kg of paddy is needed. Using this to convert farm price of paddy into retail price, the margin is only 2.5%, meaning that rice farmers receive as much as 97.5% of the retail price. If a little higher conversion rate is used, the marketing margin may be a little larger. On the assumption that 80% of brown rice is recovered from paddy and 90% of polished

rice is recovered from brown rice, the multiplier becomes 0.72, or 1.4 kg of paddy yields 1 kg of polished rice. If this factor is used, then the marketing margin becomes 3%, suggesting that the rice farmer receives 97% of the retail price. The main error in the data of Table 25 may be that the original survey treated weight loss from processing as the processing loss. Surely there will be some loss in weight, but none in value.

When a product changes form at different stages of the marketing process, it is very difficult to measure the marketing margin precisely. When paddy is processed into brown rice, the weight of the latter is about 80% of the former. This does not mean that processing loss is 20% of the original weight, because paddy and brown rice are different commodities. In fact 1 kg of paddy is equivalent to 0.8 kg of brown rice in value. The farmers' share of the retail price can be computed on this basis, if the time-lag is neglected.

Generally, 140 kg. of paddy will yield 111 kg. of brown rice which in turn will yield 100 kg. of polished rice. In other words, so far as market value is concerned, 140 kg. of paddy, 111 kg. of brown rice and 100 kg. of polished rice are equivalent. There is no loss at all when 140 kg. of paddy is processed into 111 kg. of brown rice and 111 kg. of brown rice into 100 kg. of polished rice. However, it is necessary to add processing fees because processing is required to convert paddy into brown rice and brown rice into polished rice. After these manipulations, the marketing cost of rice as readjusted is shown in Table 26. Since this is hardly the place to discuss this matter at any length, no further elaboration is attempted. For other crops, the available data are presented in Tables 27-33.

TABLE 26

Readjusted Marketing Cost of Rice

(1966)

Item	NT$		% of total marketing costs		% of retail price	
1. Farm price of paddy						
(140 kg. of paddy)		586.29				92.70
Transportation	6.50		14.08		1.03	
Packing	1.17		2.53		0.18	
Processing* (paddy to brown rice)	9.67		20.94		1.50	
Wholesale margin	8.40		18.19		1.33	
Sub-total		25.74		55.74		4.07
2. Wholesale price (111 kg.						
of brown rice)		611.03				96.77
Transportation	1.81		3.92		0.29	
Processing (brown to polished rice)	10.00		21.65		1.58	
Packing	0.41		0.89		0.06	
Retail margin	8.22		17.80		1.30	
Sub-total		20.44		44.26		3.23
3. Retail price of polished						
rice (100 kg.)		632.47				100.00
4. Total marketing cost						
(100 kg. of polished rice or 140 kg. of paddy)		46.18		100.00		

* Processing fees of government rice (NT$3.55 per 100 kg.) plus market value of by-products and of excess recovery (difference between actual and specified recovery)

TABLE 27

Marketing Cost of Fresh Sweet Potato

(1966)

Item	NT$/100 kg		% of total marketing cost		% of retail price	
1. Farm price		61.48				56.45
Transportation	11.43		24.09		10.49	
Packing	0.52		1.10		0.48	
Loss and shrinkage (1.22 kg)	1.01		2.13		0.93	
Wholesale margin	7.97		16.80		7.31	
Sub-total		20.93		44.12		19.21
2. Wholesale price		82.41				75.66
Transportation	3.00		6.32		2.75	
Packing	0.69		1.45		0.63	
Loss and shrinkage (3.65 kg.)	3.97		8.37		3.65	
Retail margin	18.85		39.74		17.31	
Sub-total		26.51		55.88		24.34
3. Retail Price		108.92				100.00
.4 Total marking cost		47.44		100.00		

Source: Same as Table 25, p. 71.

TABLE 28

Marketing Cost of Soybean

(1966)

Item	NT$/100 kg		% of total marketing cost		% of retail price	
1. Farm price		597.83				76.68
Transportation	10.13		5.57		1.30	
Packing	2.86		1.57		0.37	
Loss and shrinkage (0.7 kg.)	4.51		2.48		0.58	
Shipper's margin	28.49		15.67		3.65	
Sub-total		45.99		25.29		5.90
2. Shipper's price		643.82				82.58
Transportation	4.96		2.73		0.64	
Packing	3.26		1.79		0.42	
Loss and shrinkage (0.8 kg.)	5.59		3.08		0.72	
Wholesale margin	41.18		22.65		5.28	
Sub-total		54.99		30.25		7.06
3. Wholesale price		698.81				89.64
Transportation	1.21		0.67		0.15	
Packing	5.36		2.95		0.69	
Retail margin	74.25		40.84		9.52	
Sub-total		80.82		44.46		10.36
4. Retail price		779.63				100.00
5. Total marketing cost		181.80		100.00		

Source: Same as Table 25, page 71.

TABLE 29

Marketing Cost of Sugar

(1966)

Item	NT$/100 kg		% of total marketing costs		% of retail price	
1. Farm price		623.33				55.33
Shipper's margin		7.42		1.47		0.66
2. Shipper's price		630.75				55.99
Transportation	5.05		1.00		0.45	
Wholesale margin*	397.71		79.05		35.31	
Sub-total		402.76		80.05		35.76
3. Wholesale price		1,033.51				91.75
Transportation	1.70		0.34		0.15	
Packing	9.28		1.84		0.82	
Loss and shrinkage (1.00 kg.)	11.27		2.24		1.00	
Retail margin	70.72		14.06		6.28	
Sub-total		92.97		18.48		8.25
4. Retail price		1,126.48				100.00
5. Total marketing costs		503.15		100.00		

* Includes NT$374 excise tax.

Source: Same as table 25, p. 71.

TABLE 30

Marketing Cost of Vegetables

(1966)

Item	NT$/100 kg		% of total marketing costs		% of retail price	
1. Farm price		126.79				42.10
Transportation	18.75		10.75		6.23	
Packing	9.38		5.38		3.11	
Shipper's margin	9.68		5.55		3.21	
Sub-total		37.81		21.68		12.55
2. Shipper's price		164.60				54.65
Transportation	3.98		2.28		1.32	
Packing	2.09		1.20		0.69	
Loss and shrinkage (3.11 kg)	6.85		3.93		2.28	
Wholesale margin	42.89		24.60		14.24	
Sub-total		55.81		32.01		18.53
3. Wholesale price		220.41				73.18
Transportation	2.52		1.44		0.84	
Packing	3.02		1.73		1.00	
Loss and shrinkage (4.08 kg)	12.29		7.05		4.08	
Retail margin	62.93		36.09		20.90	
Sub-total		80.76		46.31		26.82
4. Retail price		301.17				100.00
5. Total marketing cost		174.38		100.00		

Source: Same as Table 25, p. 71.

TABLE 31

Marketing Cost of Bananas

(1966)

Item	NT$/100 kg		% of total marketing costs	% of retail price
1. Farm price		138.20		51.22
Collection	5.16		3.92	1.91
Transportation	13.06		9.92	4.84
Pre-shipping treatment	11.03		8.38	4.09
Packing	2.04		1.55	0.75
Loss acd shrinkage (4.74 kg)	9.95		7.56	3.69
Wholesale margin	30.49		23.16	11.30
Sub-total		71.73	54.49	26.58
2. Wholesale price		209.93		77.80
Transportation	5.85		4.45	2.17
Packing	3.02		2.29	1.12
Loss and shrinkage (2.62 kg)	7.07		5.37	2.62
Retail margin	43.96		33.40	16.29
Sub-total		59.90	45.51	22.20
3. Retail price		269.83		100.00
4. Total marketing cost		131.63	100.00	

Source: Same as Table 25, p. 71.

TABLE 32

Marketing Cost of Hogs

(1966)

Item	NT$/100 kg	% of total marketing costs	% of retail price
1. Farm price	1,956.02		63.68
Assembly	2.82	0.25	0.09
Transportation	9.20	0.83	0.30
Loss and shrinkage (2.41 kg)	48.90	4.38	1.59
Wholesale margin	14.60	1.31	0.48
Sub-total	75.52	6.77	2.46
2. Wholesale price	2,031.54		66.14
Transportation	15.60	1.40	0.51
Slaughtering & dressing	21.57	1.93	0.70
Slaughter loss (14.56 kg)	447.22	40.09	14.56
Packing	8.49	0.76	0.28
Taxes	292.71	26.24	9.53
Retail margin	254.44	22.81	8.28
Sub-total	1,040.03	93.23	33.86
3. Retail price	3,071.57		100.00
4. Total marketing cost	1,115.55	100.00	

Source: Same as Table 25, p. 71.

TABLE 33

Marketing Cost of Chickens

(1966)

Item	NT$/100 kg	% of total marketing costs	% of retail price
1. Farm	3,430.29		81.86
Transportation	61.57	8.10	1.47
Packing	1.84	0.24	0.04
Loss and shrinkage (1.00 kg)	36.05	4.75	0.86
Shipper's margins	75.00	9.87	1.79
Sub-total	174.46	22.95	4.16
2. Shipper's price	3,604.75		86.02
Packing	4.17	0.55	0.10
Wholesale margins	130.69	17.19	3.12
Sub-total	134.86	17.74	3.22
3. Wholesale price	3,739.61		89.24
Packing	8.38	1.11	0.20
Retail margins	442.39	58.20	10.56
Sub-total	450.77	59.31	10.76
4. Retail price	4,190.38		100.00
5. Total marketing costs	760.09	100.00	

Source: Same as Table 25, p. 71.

The spread or distribution of the consumer's dollar for the major farm products is shown in Table 34. This table illustrates the final incidence of the consumer's dollar paid for certain agricultural commodities, namely, rice, sweet potato, soybean, sugar, vegetables, bananas, pork and chicken. The data suggest that for chicken, the producer receives 82 cents of the consumer's dollar; for soybean, 77 cents; for rice, 66 cents; for pork, 64 cents; for sweet potato, 56 cents; for sugar, 55 cents; for bananas, 51 cents; and for vegetables, 42 cents. In the case of rice, the producer receives as much as 93 cents of the consumer's dollar according to the readjusted marketing cost data. It is usually considered that for perishables the farmer receives about 50 cents of the consumer's dollar; for meat and poultry, 70 cents and for grains, 80-90 cents. It is also revealed by these data that, by and large, the more perishable a commodity is, the higher the wholesale and the retail margins will be; and vice versa.

TABLE 34

The Spread of the Consumer's Dollar for Major Agricultural Commodities (%)

Item	Percentage
(1) Rice	
1. Farm Production	66.21 (92.70)*
2. Transportation	1.32 (1.32)
3. Packing and processing	25.29 (3.35)
4. Wholesale margin	2.81 (1.33)
5. Retail margin	4.37 (1.30)
Total	100.00 (100.00)
(2) Fresh Sweet Potato	
1. Farm production	56.45
2. Transportation	13.24
3. Packing, loss and shrinkage	5.69
4. Wholesale margin	7.31
5. Retail margin	17.31
Total	100.00
(3) Soybean	
1. Farm production	76.68
2. Transportation	2.09
3. Packing, loss and shrinkage	2.78
4. Shipper's margin	3.65
5. Wholesale margin	5.28
6. Retail margin	9.52
Total	100.00
(4) Sugar (domestically marketed)	
1. Farm production	55.33
2. Shipper's margin	0.66
3. Transportation	0.60
4. Packing, loss and shrinkage	1.82
5. Wholesale margin	35.31
6. Retail margin	6.28
Total	100.00
(5) Vegetables	
1. Farm production	42.10
2. Transportation	8.39
3. Packing, loss and shrinkage	11.16
4. Shipper's margin	3.21
5. Wholesale margin	14.24
6. Retail margin	20.90
Total	100.00

* Figures in parentheses represent adjusted rice marketing costs shown in Table 26.

TABLE 34 (*Continued*)

Item	Percent
(6) Bananas (domestically marketed)	
1. Farm production	51.22
2. Collection and transportation	8.92
3. Pre-shipping treatment, packing, loss and shrinkage	12.27
4. Wholesale margin	11.30
5. Retail margin	16.29
Total	100.00
(7) Hog	
1. Farm production	63.68
2. Assembly and transportation	0.90
3. Slaughter, dressing, loss and shrinkage	16.85
4. Packing	0.28
5. Taxes	9.53
6. Wholesale margin	0.48
7. Retail margin	8.28
Total	100.00
(8) Chicken	
1. Farm production	81.86
2. Transportation	1.47
3. Packing, loss and shrinkage	1.20
4. Shipper's margin	1.79
5. Wholesale margin	3.12
6. Retail margin	10.56
Total	100.00

MARKET INFORMATION AND MARKETING RESEARCH

Market Information

Market information tells about the changes or conditions of the market. In order for the whole marketing system to function efficiently, any part of the system must respond quickly to the conditions or changes of any other part of the system. In this regard, the channel through which market information flows is of great importance, which must be able to convey the information with the least distortion and delay. Timely and accurate marketing information is in fact an indispensable tool for the efficient operation of the marketing system and proper decision-making by the economic units operating in this system.

The market information channels existing in Taiwan can be broadly classified into two types. The first type constitutes part of the national economic structure and thus may be considered as some sort of social overhead, although the users or beneficiaries may have to pay for the services rendered. Mail service operated by the government is an example. To some extent, most of the mass communication media are of this type, but the range of their operation extends beyond the agricultural sector. The second type of channels are for the exclusive use of the agricultural sector and in this sense may be considered private investments for public service. Rural newspapers, farmers magazines, and broadcasting programs for the rural people belong to this category.

As a person-to-person communication medium, mail service is conveniently used to channel market information. In Taiwan, a letter sent by ordinary mail reaches its destination in two days on the west coast. Between the west and the east coasts, airmail does the same. By special delivery which costs 6 U. S. cents a piece, a letter reaches the addressee in the same municipality within a few hours, and a letter deposited in the evening is delivered to most parts of the west coast the next morning. Although a little more expensive, telephone and telegram are also extensively used in the transmission of market information marketing.

As one of the mass media, daily papers are an important market information channel. Through the newspapers, market information on agricultural commodities flows to the public, although some papers give more details than others. It has become a practice for all the fruit, vegetable and hog wholesale markets under provincial jurisdiction to report their sales prices to a daily newspaper which enjoys

the largest circulation in the rural areas. The price information on major crops at major markets appears in the newspaper on the following day, and all persons who have interests in these crops may check with it easily.

Another important communication medium is radio broadcasting. Practically all the radio stations broadcast market information in their daily programs. There is one commercial station which specializes in agricultural programs, and one government-operated station has a special agricultural program. With most of the rural villages having been electrified and most of the farm houses equipped with radio receivers, radio broadcasting is a powerful weapon in channelling market information.

Periodicals are important means for channelling market information, although they do not compete in directing in flow of market news which has a limited time value. Published only monthly, bimonthly or weekly, magazines place more emphasis on analysis of the trend and information of a continuous nature rather than day-to-day news. In these magazines, one finds more materials on marketing as a whole than mere price information. In addition to two magazines which are widely distributed on the island and address themselves to farmers, there are some others which have limited local circulation and are addressed to only special groups of farmers or persons.

By travelling back and forth between distribution markets and assembly markets, or serving as a bridge between markets, dealers of agricultural commodities form a channel through which market information is brought to the producers, and supply situation and outlook are made known to the consumers. Of necessity, marketing agencies also act as channels of information, although they may try to utilize the information primarily to their own advantage.

Government agencies in charge of agricultural marketing disseminate market information primarily for the benefit of producers and consumers. The local governments in Taiwan compile transaction and price information collected directly from fruit, vegetable and livestock markets in the form of daily, weekly or monthly reports and use mass media to disseminate the information to the general public. Periodic statistical reports and occassional papers on researches and surveys are also the means by which market information is channelled to the public.

Marketing Research

There are many arganizations and agencies which are responsible for or have an interest in conducting marketing surveys and researches. For example, Academic

institutions such as the National Taiwan University and the National Chunghsing University have graduate and undergraduate programs in the field of agricultural economics and rural sociology. These academic institutions made marketing surveys and reseach as part of their teaching and training activities. Any student who is interested in agricultural marketing may relate his Master's thesis to agricultural marketing problems. The economics and business students of other universities may work on agricultural marketing problems although it is not too popular for them to do so. The Academia Sinica which is a national research institute is also staffed with agricultural economists who conduct marketing research occasionally.

Some government agencies whose primary responsibilities are agricultural administration conduct surveys and studies on various agricultural marketing problems. The Provincial Department of Agriculture and Forestry is the leading government agency which is active in this field. The Joint Commission on Rural Reconstruction (JCRR), a semi-governmental agency dedicated to the development of agriculture and the advancement of rural warfare, has for a long time been interested in studies related to agricultural marketing. Besides conducting studies of its own, JCRR also provides financial and technical assistance for survey and research projects of other agencies. For want of sufficient financial resources and competent professional personnel, most agencies rely heavily on JCRR's financial and technical support for their marketing studies. The Bureau of Commodity Inspection and Quarantine perfoarms largely technically-oriented researches such as packing and storing methods, other forms of physical handling in transit as well as packing materials and containers, mainly for export products.

State enterprises which engage in the marketing of agricultural commodities, and producers' cooperatives which handle the marketing business for their farmer members, carry out marketing studies in their own business interests. Their survey and research projects are in most cases related to their business operations, and problems and necessarily limited to the commodities they handle.

In Taipei, there is a specialized agricultural marketing research institution called Foreign Agricultural Market Study Center. While the financial resources of this Center come mostly from government support, it is operated as an independent unit. As its name implies, the Center has more interests in foreign markets.

Most marketing surveys and research projects in Taiwan have been carried out after World War II. Before the war, marketing studies were monopolized by academicians, with their subjects and contents dominated by academic curiosity. After the war, marketing studies have been much expanded in scope, becoming

the concern not only of academic circles but also of government agencies and business organizations.

In its first stage of development, marketing resarth was aimed at understanding the existing marketing situations. The studies were centered around the identification and description of marketing channels, nature and kind of marketing agencies and market organizations, physical marketing facilities, marketing practices such as collecting, storage, processing, transaction, transportation and other forms of physical handling of the commodity, and marketing costs and margins. This kind of descriptive study is useful for understanding the overall picture of the marketing economy and for providing a basis for further studies in detail. Surveys and researches of this nature were conducted on single crops, such as rice, sweet potato, peanut, wheat, bananas, and hogs and poultry. Some of them covered only marketing proper, but many of them were treated as a part of the overall economic study of a single commodity, dealing with production, marketing, consumption and international trade.

Then some shifts in the major interest of marketing resarch were observed. Instead of general studies of a descriptive nature, more emphasis was placed on analysis of problems which hindered progress in marketing development. These studies were trouble-solving in nature, aimed at raising marketing efficiencies, rationalization of marketing practices and modernization of marketing operations. Though very narrow in scope, these studies contributed to the actual solving of marketing problems.

Recently, a keen interest has been shown in the study of foreign markets for exportable farm products of Taiwan. In recent years, development of international trade has become a world wide campaign. In Taiwan, promotion of agricultural export is considered highly necessary for the further development of the national economy. Amidst the global concern and interest in expanding or maintaining the existing foreign markets and exploring potential foreign markets, several market studies for Taiwan's exportable commodities have been made, mainly on the initiative of the Joint Commission on Rural Reconstruction. The establishment of the Foreign Market Study Center reflects the movement in this new direction. Since its inauguration in 1964, this institution has done much in studying foreign markets, collecting relevant data from all sources, and disseminating foreign market information to the local people.

GOVERNMENT POLICIES AND IMPROVEMENT MEASURES

By marketing policies, it means here all government activities that have an impact on agricultural marketing either directly or indirectly. Very often it is difficult to differenciate marketing policies from other policies, especially from production, income and price policies, since all these have some influence on the marketing of the subject commodity. The distinction between marketing and price policies is particularly unclear, because both of them may have the same objectives and one may be the means or end of the other. It may be advisable, however, to classify the activities directly aimed at coping with problems as price policies and those for streamlining the commodity flow as marketing policies. It may be more practical, nevertheless, to combine them and call them just price and marketing policies.

By and large, the government has not, emphasized too much price and marketing policies from the standpoint of the farmers. Instead, it has paid more attention to the welfare of the consumers. In the case of rice, the government controls nearly a half of the annual production, and uses it as a means to keep the price of rice at a relatively low level. On the other hand, chemical fertilizers and other major production materials are supplied by the government either through cash sales or as loans to be repaid in kind after harvest to encourage prodction by the farmers. As a result, the farmers' need for cash immediately after harvest is alleviated and the rice price in this period can be stabilized. In addition, the speculative price manipulations by rice merchants are prohibited by the food authorities, which can order the merchants to release their stock, thus eliminating their excessive hoarding and profiteering. Government regulations on rice marketing have helped stabilize rice prices and markets, but it is doubtful whether the marketing efficiency in terms of benefit-cost calculations has been upgraded.

In the case of livestock and livestock products, the government employs two kinds of measures to influence their marketing. With regard to domestic marketing, the government regulates the operation of lovestock makets by enforcement of market laws and encourages the famers' associations to promote cooperative shipment of hogs from the producing areas to consumption centers. In the case of milk, the milk bottling plants are required to purchase raw milk from the dairy farmers at a floor price set up by the government, and during winter when raw milk supply exceeds demand, subsidies are given to the milk processing plants to utilize the surplus milk for milk powder production. In addition, purchase of milk for

the school lunch program is subsidized by the government to encourage milk consumption. In export marketing, slaughter taxes and feed import duties are rebated when the cut meat or dressed carcass is exported. In time of sharp price hiks, however, export of meat or live animal is prohibited. The collection of slaughter taxes on large animals influences meat marketing significantion. The purpose of this tax is to increase government revenue and no consideration is given to its possible influence on marketing.

For perishable commodities including fruits, vegetables and fishes, government control is placed on the operation and management of the wholesale markets of these commodities. According to the Regulations Governing the Operation and Management of Agricultural Wholesale Markets, the establishment of any wholesale market should be approved by the competent government authorities. The methods of transaction, collection of fees, payment of sales, proceeds to the supplier, the financial treatment of the market, etc. are all provided for in these regulatios. Cooperative marketing of fruits and vegetables is encouraged by the government as a pace setter to influence the business operations of the commercial establishments engaged in agricultural marketing. For the processing of raw materials such as mushrooms, asparagus, pineapples, sugarcane, and tobacco leaves, productin and supply contracts between the producers and the processing plants are to be concluded according to government approved plans.

In Taiwan, agricultural marketing problems have been given increasing attention in recent years. It is generally felt that production technique no longer poses an urgent problem; it is marketing that needs more emphasis and strengthening. As tangible efforts, the government has taken the following steps to improve agricultural marketing. They are, as can be seen, meant to increase marketing efficiency through the promotion of the free market mechanism, and not to interfere with the operation of the free competitive market.

1. Renovation and expansion of physical marketing facilities. In the initial stages of postwar agricultural development, emphasis was placed on such physical facilities as rice warehouses, fertilizer warehouses, seed granaries, rice milling facilities, etc. In recent years, facilities for perishable products such as fruit collecting and packing stations, market transaction halls, and storage and cold storage facilities have been stressed.

2. Introduction of new and modern techniques. Measures in this category, include the introduction of livestock carcass transaction system to replace live animal or live bird transaction method; retailing of frozen meat, poultry and fish;

improved packing and grading at the shipping points; pre-packing and pre-cooling either at the shipping points or in the consumption centers; direct supply of farm products to the retailers or institutional consumers by the growers organizations; improvement of the techniques of physical distribution, etc.

3. Promotion of cooperative marketing by fruit marketing cooperatives and farmers' associations. Through the cooperative approach, it is expected that the farmers will have more marketing outlets and that their bargaining power will be strengthened.

4. Enlargement of the business scale of small marketing units, especially at the retail level. Since most of the marketing establishments are small-scaled, this measure is expected to raise their operational efficiency.

5. Training and research in marketing to develop human resources related to marketing and work out practibable improvement measures through objective and scientific inquiries.

Sixth: Revision of laws and regulations which hinder the progress of marketing improvement.

FUTURE PROSPECTS

Anything changes in the process of growth. The change may be in the external appearance, physical structure, internal quality, or functional relationship between parts which constitute the whole body. In an economy which is growing rapidly, agricultural marketing must also change.

When an organic body grows to twice the original size, not all the parts will become twice as large as the original one. When the national economy grows, agricultural marketing channels do need to grow, but not in exact proportion. In addition to physical growth, qualitative changes may be equally important.

Marketing may be productive and/or promotive. For marketing to be productive in a dynamic, growing economy, it should progress hand in hand with economic development; and for it to be promotive, it should precede and lead economic growth. In the writer's opinion, Taiwan's agricultural marketing is now already in the productive stage. However, there is yet a long way to go before it reaches the promotive stage. The future prospects of agricultural marketing are tentatively given below to conclude this paper.

First, the unit transactions at assembly and distribution markets will be much larger. Along with commercialization and specialization in agricultural production, development of larger unit capacity transportation facilities, expansion of the business volume of marketing enterprises, the unit transactions at the local and wholesale markets will inevitably become larger. With the availability of refrigerators to the average family and the increase of wage rates, housewives will find it uneconomical to go to the market everyday. Instead, they can purchase a one-week supply at one time and devote the time saved to productive activities. Therefore, the unit transactions at the retail level will also be larger than before. Together with the increase in turnover velocity, the total business volume of the marketing firms will be raised to a much higher level.

Second, producers and consumers will be brought closer together, meaning that some type of vertical integration will develop to eliminate part of the existing intermediaries. This does not necessarily mean that their marketing functions will be put to an end, but the performance of the functions may be integrated into other activities. There will be two directions in this movement. The first is the development of cooperative marketing which extends producers' activities right to the door of the consumer. The second is the development of supermarkets and chain stores which extend retailer's procurement activities to the farmyard or to

the local assembly market, instead of buying at the wholesale market at the consumption centers. The development of consumer cooperatives has the same implications. But as far as procurement of foods, especially perishables is concerned, consumer cooperatives do not seem to have progressed much in this direction. Producers' cooperatives tend to gain more weight in the vertical integration of agricultural marketing.

Third, the scope of activities related to cooperative marketing will be enlarged. The most important activities in this regard are educational programs sponsored by marketing cooperatives. The improvement and modernization of agricultural marketing must start from farm production. In order to raise marketing efficiency, educational and training programs must be developed to upgrade the technical capabilities of the farmers so that the produce brought out by them will meet the requirements of efficient handling in the marketing process besides satisfying the various consumer's tastes and preferences.

Equally important are processing activities such as canning, dehydration and freeze-drying of perishables, and freezing of perishables. These will be necessary and effective means to adjust the production and supply seasonality to non-seasonal market demands.

Fourth, more refrigeration facilities will be attached to the markets. Up to the present, refrigeration is used only for longer term storage, and most of the perishables are marketed fresh without any refrigeration. In order to maintain the freshness and reduce loss from shrinkage and spoilage, and as the consumers become willing and able to pay the cost incidental to this service, more refrigeration will be used in the marketing process.

Fifth, more efforts will be made to eliminate or reduce the inedible or unusable parts of the produce at the shipping point. Agricultural commodities, especially perishables, are often marketed without any treatment before shipment, containing a large proportion inedible or unusable parts. This increase the unit marketing cost of the usable or edible parts, because not only transportatiion cost but transaction and other handling charges also become higher. Consequently, inconvenience and additional cost are caused to the consumer who buys and uses this commodity. Treatment at the shipping point to get rid of the undesirable parts will be an additional service rendered by the producers or shippers.

Finally, more pre-packaging will be done at the shipping point. This means that before shipment, commodities will be packed into retail units which the retailer can buy or into consumer units which the retailer can sell without any further

division. Presently, perishables and other food item are sold to the retailers and consumers without any pre-packaging. The retailer and consumer can specify any purchase unit, and weighing is done on the spot. As the economy grows wage rates will rise. Neither the dealar nor the buyer can then afford to waste too much time on this in the future. The commodities, including perishables, will be packed into units of different sizes convenient for the retailers and consumers to purchase. This service will result in a larger turnover of business by individual dealers at both wholesale and retail levels.

Appendix 1

Rice Collections of Provincial Food Bureau, 1958-1970

Unit: m/t brown rice equivalent

Item	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Rural land tax in kind	70,615	58,564	75,270	67,248	84,428	79,117	88,174	96,928	82,092	120,200	137,102	99,095	126,964
Compulsory purchase	59,140	44,518	56,766	56,029	57,761	51,142	56,898	62,321	52,644	61,841	64,368	45,954	58,383
Rent on and land value from sale of public land	15,486	10,120	2,025	3,949	1,402	256	37,681	37,590	18,440	16,626	14,633	7,161	11,836
Land value under the Land-to-the-Tiller Program	41,254	50,780	16,458	32,076	29,642	13,568	11,435	9,750	3,414	2,935	2,480	5,261	1,789
Fertilizer barter	339,269	325,792	293,102	364,925	381,975	376,385	438,110	396,972	449,150	439,611	456,104	328,472	280,532
Repayment of production loan	13,238	14,961	9,280	10,510	9,030	10,653	9,184	8,028	11,892	14,436	13,140	11,990	9,937
Others	5,839	8,429	13,346	38,150	32,180	34,380	28,166	41,877	18,792	8,935	9,671	8,962	9,770
Total	544,841	513,164	466,247	572,887	596,418	565,501	669,648	653,466	636,424	664,584	697,498	506,895	499,211
Year end stocks	322,009	199,704	140,058	296,021	435,815	393,047	496,836	401,153	636,424	664,584	697,498	533,847	528,583

Source: Compiled by the Rural Economics Division JCRR, based on data from PFB's Financial Operating Statements.

Appendix 2

Rice Disposals of Provincial Food Bureau, 1958-1970

Unit: m/t brown rice equivalent

Items	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Rations to Armed Forces	155,508	140,905	124,420	123,040	120,519	129,151	125,436	126,771	128,895	123,584	117,598	121,876	119,882
Rations to Provincial Armed Forces	4,887	1,939	4,240	3,385	5,305	2,874	4,800	4,822	4,934	3,793	4,488	4,596	4,125
Rations to military dependents	36,267	37,635	42,587	41,444	37,625	39,885	43,411	46,575	50,830	55,217	58,876	61,132	62,078
Rations to government employees & teachers	103,590	112,024	103,045	104,825	109,638	112,486	118,048	122,659	126,611	128,248	123,425	103,500	69,213
Market stabilization sales	80,768	106,845	243,879	151,806	100,331	129,413	115,290	141,823	163,676	198,442	185,407	28,697	172,902
Export	217,491	177,849	38,895	72,222	56,944	173,289	126,829	293,988	218,883	127,404	78,234	30,930	13,583
Others	31,688	35,618	37,593	41,248	39,330	35,757	55,726	41,220	41,953	55,655	72,367	58,413	84,247
Total	630,199	612,815	594,658	537,970	469,692	622,855	589,540	777,858	735,782	692,343	642,395	409,135	526,030

Source: Compiled by RED, JCRR, based on data from PFB's Financial Operating Statements.

Appendix 3 Trends of Area, Yield and Production of Selected Crops

1955-1970

Year	Rice	Sweet potatoes	Wheat	Peanuts	Soybean	Sugarcane	Jute	Tobacco
				1. Area[a] (1,000 hectares)				
1955	750.7	245.5	12.8	96.0	34.5	77.9	15.2	6.2
1956	783.6	230.2	15.6	98.3	37.5	90.9	13.7	8.3
1957	783.3	228.8	19.9	103.6	41.0	98.2	6.9	9.7
1958	778.2	228.7	22.7	104.0	47.9	101.5	12.7	8.8
1959	776.1	226.5	22.8	99.1	53.8	99.2	17.9	8.4
1960	766.4	235.4	25.2	100.5	59.7	95.5	16.3	8.0
1961	782.5	235.8	21.8	98.6	59.6	100.2	11.2	7.7
1962	794.2	233.7	20.4	96.3	55.0	93.5	7.9	7.5
1963	749.2	235.7	16.5	97.7	55.2	94.1	9.2	8.7
1964	764.9	245.2	9.5	100.9	51.0	95.0	8.2	8.7
1965	773.0	234.2	11.1	103.6	53.2	110.7	9.0	8.0
1966	788.6	235.6	14.5	98.2	51.3	105.7	8.1	7.6
1967	787.1	236.8	11.9	97.9	52.3	90.2	7.6	10.0
1968	789.9	240.3	7.7	95.3	49.5	95.9	8.0	11.1
1969	786.6	232.7	4.7	91.4	45.3	93.3	9.3	12.0
1970	776.1	228.7	2.0	87.5	42.7	86.2	6.3	11.1
				2. Area (Index: 1938=100)				
1955	120	182	1,180	309	552	60	182	377
1956	125	171	1,435	316	600	70	163	501
1957	125	170	1,829	333	656	75	82	586
1958	124	170	2,086	335	766	78	152	532
1959	124	168	2,096	319	860	76	214	508
1960	123	175	2,316	323	955	73	195	483
1961	125	175	2,004	317	953	77	134	465
1962	127	173	1,875	310	879	72	94	453
1963	120	175	1,517	314	883	72	110	525
1964	122	182	873	324	816	73	98	525
1965	124	174	1,020	333	851	85	108	483
1966	126	175	1,333	316	821	81	96	460
1967	126	176	1,093	315	836	89	90	604
1968	126	179	708	307	791	74	95	673
1969	126	173	428	294	724	72	111	722
1970	124	170	184	281	684	66	75	668

Trends of Area, Yield and Production of Selected Crops (*Continued*)
1955-1970

Year	Rice	Sweet potatoes	Wheat	Peanuts	Soybean	Sugarcane	Jute	Tobacco
			3. Yield per hectare (Index: 1938 [b]=100)					
1955	97	77	59	77	108	112	115	106
1956	103	87	128	92	108	100	117	105
1957	106	92	134	100	124	104	122	110
1958	110	101	130	103	134	107	123	110
1959	108	100	139	108	127	117	123	112
1960	113	99	133	112	136	101	117	114
1961	116	107	150	117	139	114	115	118
1962	120	103	153	109	150	94	128	122
1963	127	74	96	107	150	99	143	114
1964	132	106	155	127	174	102	184	127
1965	137	104	156	134	190	123	175	116
1966	136	115	147	130	190	121	162	113
1967	138	123	148	135	221	107	172	102
1968	144	112	155	124	228	124	153	106
1969	133	124	150	122	228	108	175	98
1970	141	117	138	156	234	100	203	107
			4. Production (Index: 1938 [b]=100)					
1955	116	141	699	237	595	67	209	402
1956	129	149	1,838	291	651	70	191	525
1957	132	156	2,451	334	814	78	100	647
1958	136	171	2,704	343	1,026	83	188	581
1959	134	168	2,919	345	1,094	89	263	567
1960	138	173	3,092	364	1,296	74	228	550
1961	145	187	3,002	372	1,327	87	154	547
1962	152	178	2,856	340	1,305	68	120	555
1963	152	124	1,271	325	1,296	72	158	601
1964	162	194	1,337	411	1,419	74	181	669
1965	169	181	1,594	447	1,618	105	189	563
1966	171	200	1,934	409	1,558	98	157	520
1967	174	216	1,619	488	1,852	74	156	612
1968	181	200	1,102	379	1,797	91	145	714
1969	167	214	641	359	1,652	77	194	708
1970	177	199	236	435	1,604	66	152	718

(a) Sugarcane is an exception, for which the figures refer to havested area instead of planted area.
(b) 1938 was the peak year for yields of rice, wheat, sweet potatoes and soya beans in the prewar period.
Source: **Taiwan Agricultural Yearbook,** Department of Agriculture and Forestry, Provincial Government of Taiwan.