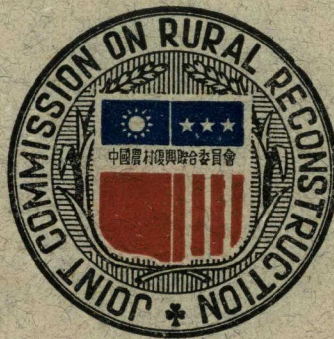


CHINESE-AMERICAN
JOINT COMMISSION ON RURAL RECONSTRUCTION

Economic Digest Series: No. 5

A STUDY ON THE EXPORT POTENTIALITY AND ELASTICITY
OF AGRICULTURAL PRODUCTS IN TAIWAN

Prepared by
Plant Industry and Rural Economics Divisions, JCRR
in cooperation with
Committee D of the Economic Stabilization Board
of the Executive Yuan.



TAIPEI, TAIWAN, CHINA

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A Study on the Export Potentiality and Elasticity of Agricultural Products in Taiwan

I. Summary and Conclusions:

1. White Sugar and Brown Sugar

a. White Sugar

As the exportation of white sugar from Taiwan is regulated by the International Sugar Agreement, discussion on its export potential and elasticity is excluded from this report.

b. Brown Sugar

The export elasticity of brown sugar is great. An increase in the NT\$ price received from export will directly benefit growers, for farmers divide sugar with sugar mill on a 50:50 basis. This will quite certainly induce more planting and a greater intensity of farming.

The demand for import of Taiwan's brown sugar in Japan is also great. It may increase from the 11,827 m t of the 1953-54 crop to over 20,000 m t up to a maximum of 40,000 m/t. Taiwan brown sugar enjoys a premium quality.

2. Rice

Rice export is handled by Government and rice is collected by the Government through the barter of fertilizer and other commodities. An increase of farm price of paddy will have medium effect on farming intensity of rice, but small effect on its acreage expansion. Continuous increase of domestic consumption tends to offset gain in production. Shifting of rice from domestic consumption to export can be achieved through strong government policy enforcement.

The demand for import of Taiwan's rice in Japan has recently been weakened due to availability of rice from other countries and strict food program enforcement in Japan.

3. Canned Pineapple

The standing formula for the Taiwan Pineapple Corporation to fix the price offered for purchasing fresh fruit from farmers is to deduct from the NT\$ price receivable from export the processing, management expenses, etc., and pay farmers within the limit of what is left.

An increase of NT\$ price received from export theoretically would enable the canneries to pay farmers a better price, and thus stimulate more production

and give canneries a better control over the supply of the raw fruit. But the simultaneous increase in cost of imported tin plate for can should be considered.

The demand elasticity for Taiwan canned pineapple on international market is great. Taiwan will have no difficulty in exporting 1,000,000 cases of canned pineapple as compared with the export of 523,000 cases in 1953.

4. Refined Tea

An increase of NT\$ price received from export will be followed immediately by a raise of price of fresh tea leaves, the supply of which falls short of the existing factory capacity. The tea export will not be significantly increased for the profit of manufacturers and exporters will not be much increased. The higher price of fresh leaves, however, will encourage more intensive management of tea gardens and more planting by farmers. The consequent increase in total production of leaves will bring down the price of fresh leaves in the long run as supply increases. An expansion of export will then become possible.

International market price of tea fluctuates greatly from time to time, subject to the control of the major buying countries (England, U.S.A., North Africa) and influenced by the supply from major producing countries (India, Ceylon, Java, Mainland China and Japan). Taiwan can move its tea out smoothly only by underselling these major producing countries. Under this over-ruling premise, the demand for Taiwan tea on the international market is quite elastic.

5. Banana

Theoretically, an increase of NT\$ price received from export would stimulate both production and export of banana, because it is rather easy (1) for farmers to expand banana acreage and (2) to shift local consumption (now over 60% to export). But actually, it would not be so because (1) the Government will enforce the retirement of banana planting on steep slopes for soil conservation and (2) banana is currently exported only to Japan which maintains a strict banana import quota.

6. Citronella Oil

Since citronella oil is 100 percent for export, expansion of export is possible only when production increases. An increase of NT\$ price received from export would tend to stimulate new planting of citronella grass and more intensive culture. But Government soil conservation measures will tend to limit the reckless acreage expansion on hills.

International market price is controlled by U.S.A., the biggest buyer, but

Taiwan, being the largest producer, can exert profound influence on the price by controlling its volume of export. An efficient export control of this oil is necessary. When this is done, the world price of citronella oil may be manipulated to the advantage of this Island, and its production may be planned on a more sound basis.

7. Citrus Fruits

An increase of NT\$ price received from export would definitely increase both the quantity of export and production, because (1) production of citrus responds very much to intensity of orchard management and (2) it is easy to shift local consumption (about 95%) to export.

The only markets for Taiwan citrus now are Hongkong and Singapore. Competition from other producing areas on these markets are keen, and Taiwan fruits are of a comparatively lower grade. The demand elasticity on these market for Taiwan citrus fruits, however, is great. Export of citrus may be considerably expanded if a stronger support is given by the Government and the suicidal competition among individual exporters avoided.

8. Feather

A raise of NT\$ price received from export would stimulate more production. The price of feather is not an important factor in determining the number of ducks/geese raised, but is decisive in determining how much feather the farmers may collect for sales to exporters. The quantity of feather exported in 1953 amounted to only 1/3 of the feasible maximum production. Local consumption of feather is negligible regardless of price changes.

90 percent of feather exported from Taiwan go to U.S. It is believed that the market there for Taiwan feather may be greatly expanded if its quality is improved and price reasonable.

9. Bamboo (shoots and poles)

A raise of NT\$ price received from export will increase the quantity of bamboo export. The present export is only a negligible fraction of the feasible production. A part of bamboo is left rotten on hills because local consumption is limited and the profit from its export is too low.

U.S. has so far been the only market for bamboo exported from Taiwan. It is believed the sales there may be greatly expanded.

Table 1. Factors Related to Export Elasticity of Agricultural Products of Taiwan

Factors	Brown Sugar (to Japan)	Rice (to Japan)	Canned Pineapple	Tea	Banana (to Japan)	Citronella Oil	Citrus Fruit (to Hongkong)	Feather	Bamboo shoots and poles
1. Whether an increase of farm price would increase intensity in agricultural production?	Effect great	Effect medium	Effect great	Effect great	Effect medium	Effect great	Effect great	Effect great	Effect great
2. Will it tend to expand the crop acreage?	Effect great	Effect small	Effect great	Effect medium	Effect small	Effect small if gov't enforce soil conservation	Effect great	—	no
3. Percentage of present export in total production	More than 2/3	Less than 10%	About 50%	Over 90%	Below 40%	100%	Negligible	1/3 of feasible max. production in 1953	negligible
4. Need of processing	Sugar milling	Rice milling	Canning	Making into crude tea then refined tea	No	Simple distillation	No	Simple	Simple
5. Effect of income changes on local consumption elasticity	Effect small	Effect small	Effect great	Effect small	Effect great	No	Effect great	Effect very small	Effect small
6. Effect of price change on local consumption elasticity	Effect small	Effect great	Effect great	Effect small	Effect great	No	Effect great	Effect very small	Effect small
7. Organizations concerned with marketing	Fairly good	Gov't export	Good	Competition among conflicting interests handicaps export	Exporter's interest conflicting with producers	Weak unless Gov't intervene	Suicidal competition among exporters	Offers no problem	Offers no problem

Table 2. Factors Related to Demand Elasticity of Agricultural Products of Taiwan in Foreign Market

Factor	Brown Sugar (to Japan)	Rice (to Japan)	Canned Pineapple	Tea	Banana (to Japan)	Citronella oil	Citrus Fruits (to Hongkong)	Feather	Bamboo shoot and poles
1. % of import of Taiwan product in total import	1/8 at present may be increased to 1/4 or a max. of 1/2	5-1.0%	Vary in different countries 50-80 Taiwan production 2-3% of world trade	Mostly rather small	100%	Vary in different countries, Taiwan production about 50% of total world production	40-50%	Negligible	Very small
2. Effect of change of income or price on consumption in importing countries	Great	Small	Great	Medium	Great	Indirect	Great	Great	Great
3. Price competition	Strong	Recently turning strong	Medium	Strong	Small	Strong	Strong	?	?
4. Grade/quality differentiation, Taiwan as other producing countries	Taiwan superior	Taiwan superior	Flavor of Taiwan product differs from that of Hawaii. Preferred at some areas	Taiwan lower grade	Taiwan prevailing	Relatively homogeneous	Taiwan inferior	?	?
5. Local production and supply elasticity of importing countries	Local and Ryukus supply 1/15	Local supply 5/6 of requirement	Vary	Supply from competing countries highly elastic	Negligible	Supply from competing countries mediumly elastic	Supply from competing countries highly elastic	?	?
6. Import & exchange control in importing country	Set quota	Gov't. purchase	Vary	Not important for the small amount Taiwan export	Strict import quota	No	No	No	No
7. Trade or barter agreement	Trade agreement quota and extra quota	Sino-Japanese trade agreement	Mostly no	Green tea with France	Sino-Japanese trade agreement	No	No	No	No

II. Purposes and Methodology:

1. Purposes

Discussion in this report is concentrated in two phases of the agricultural export problem: (1) export elasticities of Taiwan agricultural products, or the relationship between the NT\$ price received for agricultural products from export market and the volume of export, and 2) demand elasticities of Taiwan agricultural products in foreign markets, or the relationship between the US\$ (or other currencies) price of Taiwan agricultural products in foreign markets and the volume of import taken by foreign countries.

The purposes of this study are: (1) to examine various factors affecting the production, processing, marketing and consumption of exportable farm products which are essential for evaluating the export elasticities of these products, and (2) to examine the market structure, exchange and trade control and consumption of Taiwan farm products in foreign markets which are essential for evaluating the demand elasticities of Taiwan farm products in foreign countries. The knowledge on export and demand elasticities of farm products is essential for making export and trade control policies and for the revision of foreign exchange control and other related regulations. Such information is also necessary for determining the effects of an adjustment of foreign exchange or other trade control measures on foreign exchange earnings and overall economy.

2. Methodology

A. Discussion on export and demand elasticities is made on individual commodity basis as different farm products have different production, processing, marketing and consumption conditions.

B. If an adjustment of foreign exchange or other trade control measures results only in an increase of exporters' profit margin with negligible effect on farm prices actually received by farmers, intensity and acreage of cultivation of exportable crops are unlikely to be affected and output responsiveness will be very small. However, as exporters' profit margin increases, they are likely to make greater efforts in collecting farm products from the domestic market for export and part of the farm products formerly for domestic consumption will be diverted to export. Under this circumstance, the export elasticities will be relatively small. In most cases, exporters are unable to retain the whole benefit from exchange rate adjustment (except government monopoly in rice export) and farmers will share part of the benefit in the form of increased farm price. The

case in which exporters will get the entire benefit from exchange rate adjustment is very rare.

C. If an adjustment of foreign exchange or other trade control measures results in increases of both exporters' profit margin and farm prices of exportable crops, output responsiveness will occur. Under this circumstance, the export elasticities of these crops will be influenced by the following production, processing, marketing and consumption conditions:

1. The possibilities of increasing intensity in crop cultivation, unit yield and the improvement of quality. These will greatly affect the total output and hence the export potentiality and elasticity.

2. The possibility and extent of acreage expansion. As the growing seasons vary with crops from about four months for rice, eighteen months for sugarcane, 18-24 months for pineapple and several years for citrus fruits, the effect of acreage expansion on export potentiality and elasticity may occur during the season, in the year or after several years depending on the length of the growing season of the crop in question.

3. The percentage of export volume to total production prior to an adjustment of foreign exchange or other control measures. The higher the percentage of export volume, the smaller the possibility of diversion from domestic consumption for export, and the smaller the export potentiality and elasticity. As diversion from domestic consumption for export could occur during the season, its effect on export potentiality and elasticity is immediate.

4. Needs for processing and manufacturing of raw crops, supply and capacity of processing facilities and equipment, and limitations if any. With simpler process and facilities in its processing, the export elasticity tends to be closer to the output elasticity of the crop. On the other hand, if the processing of a given crop involves long and complicated process and the application of scarce and limited factors, its export elasticity tends to be smaller than and lag behind the output elasticity.

5. Income-consumption elasticity of exportable crops in the domestic market. Income elasticity is a measure of the effect of change in income level on the quantity of consumption of a given commodity by the consumers. Increased farm price and increased middlemen's profit margin together with increases in farm output and volume of business as a result of exchange rate adjustment will no doubt raise the income level of the general public. The greater the income elasticity of a crop, the greater the possibility of increasing

the quantity of domestic consumption after increases of its output and price. Hence, the increase in its export is likely to be less proportionally than the increase in its total output. Under this circumstance, export elasticity will be smaller than output elasticity. The reverse is true for a crop with smaller income elasticity.

6. Price elasticities of exportable crops in the domestic market. Price elasticity is a measure of the effect of change in price of a given commodity on the quantity of purchase by the consumers. The price levels of exportable crops in the domestic market will be raised following an adjustment of exchange rate. The change in total quantity of purchase in the domestic market caused by the increase of price will bring diversion from domestic consumption for export. The greater the price elasticity of a crop in the domestic market, the greater the reduction of total quantity of purchase by domestic consumers, and the greater the possibility of diversion from domestic consumption for export, and hence the greater the export elasticity of the crop in question. The reverse is true for a crop with smaller price elasticity.

7. Production, processing and marketing organization of exportable farm products. Farm products with good organization and proper planning in the fields of production, processing and marketing will have greater export elasticity, while those with poor organization and improper planning will have smaller export elasticity.

D. Demand elasticities of Taiwan agricultural products in foreign markets will determine to what extent and under what price condition Taiwan can expand its volume of export. With great elasticities of demand for them in foreign markets, Taiwan can expand the volume of export with only slight decrease in export price. On the other hand, if the demand elasticities are small, total revenue of foreign exchange from greater volume of export is likely to be less than from smaller export volume. It is, therefore, very important to know demand elasticities in foreign markets for the planning of Taiwan's agricultural export policy.

Generally speaking, demand elasticities of Taiwan agricultural products in foreign markets will be influenced by the following factors:

1. The percentage of import of the agricultural product from Taiwan to the total import. The greater the percentage, the greater the extent of price reduction when Taiwan expands its export (demand curve of Taiwan products is quite inelastic). The smaller the percentage, the smaller the extent of price

reduction demand curve of Taiwan products is quite elastic or even horizontal .

2. Income-consumption elasticities and price elasticities of Taiwan products in foreign markets.

3. Condition of market and price competitions with Taiwan products in foreign markets.

4. Degree of differentiation or homogeneity of grade and quality of Taiwan products in comparison with products from other exporting countries.

5. Local production and supply elasticities of the imported products in importing countries and the degree and possibility of substitution with other products.

6. Import and exchange controls or restrictions in importing countries.

7. Existence or non-existence of trade agreement or barter trade restrictions between Taiwan and importing countries.

3. Selection of Items for Observation

The following nine items of major exportable agricultural products of Taiwan are selected for observation:

1. White sugar and brown sugar
2. Rice
3. Canned pineapple
4. Refined tea
5. Banana
6. Citronella oil
7. Citrus
8. Feather
9. Bamboo shoots and bamboo poles

As the exportation of white sugar from Taiwan is regulated by the International Sugar Agreement, discussion on its export potential and elasticity is excluded from this report.

The relative importance of these nine selected items in the total export value and total agricultural export value is shown as follows:

	1952		1953		1954 (Estimate)
	% of total value of agri. export	% of total value of all export	% of total value of agri. export	% of total value of all export	% of total value of agri. export
White sugar & brown sugar	60.73	58.31	74.16	69.54	54.76
Rice	20.25	19.44	9.33	8.49	25.62
Tea	5.07	4.87	5.63	5.28	6.41
Banana	5.73	5.55	2.30	2.63	4.20
Canned pineapple	1.74	1.67	2.15	2.02	2.65
Citronella oil	2.14	2.05	1.31	1.70	1.77
Fruits, fresh	0.67	0.64	0.11	0.10	0.13
Bamboo poles & shoots	0.53	0.51	0.82	0.77	0.88
Feather	1.36	1.31	0.63	0.59	0.71
All 9 items	98.27	94.35	97.44	91.12	97.13
Total value of all export US\$)	—	119,511,986	—	129,796,738	—
Total value of agri. export US\$)	114,743,458	—	121,710,402	—	113,190,000

III. Individual Analysis:

1. Brown Sugar (Molasses sugar)

If NT\$ export price of molasses sugar is increased, molasses-sugar growers would get a better return from the sugarcane he hands over to the mill to be crushed. Sugar resulted from processing is divided between the farmer and the mill at a 50:50 ratio. Farmer can keep or sell his share to any one he chooses at a price he would accept, although, for the sake of convenience, usually sells his sugar to the mill at a price which is announced by the mill once a month. The announced price will reflect the export price the exporters pay to the mill.

With better price for his product sold, farmer will have the incentive to pay better attention to the crop he is growing. Sugarcane for molasses-sugar is grown on hilly regions where soil-productivity is low. However,

there is ample room left for farmers to improve their cultural practices and ultimately to attain better yield per unit-area, only if technical progress made in growing sugarcane for white sugar could be followed. These growers are still planting those old low-yield varieties which should be replaced by better varieties released by the Taiwan Sugar Corporation. Fertilizers were not applied in proper quantity. In 1952 less than 10% of the allotted fertilizer was purchased by farmers; in 1953, only about 40%. No measure of pest control had been practiced. If proper guidance be given by the Government on these technical improvements and if farmers have money to pay part of the expenses thus incurred, there is the possibility of increasing yield of molasses sugar.

The following table shows the fluctuations of unit-area yield and total production of, and acreage of sugarcane crop growing for, molass-sugar from 1938-43:

Year	Unit-Area Yield (kg/ha)	Harvested Acreage (há)	Total Production (kg)
1938-39	6,394	6,989	44,687,000
1939-40	5,488	6,521	35,787,000
1940-41	3,629	4,115	14,936,000
1941-42	5,065	3,502	17,740,000
1942-43	5,299	3,633	19,253,000
1943-44	4,642	2,592	12,023,000
1944-45	2,716	1,327	3,605,000
1946-47	3,163	135	427,000
1947-48	2,972	1,619	4,520,000
1948-49	2,701	4,565	12,332,000
1949-50	2,694	4,055	10,919,000
1950-51	2,254	1,618	3,646,000
1951-52	2,433	3,287	8,007,000
1952-53	3,825	3,836	19,027,000
1953-54	4,034	2,863	11,827,000

In our 4-year plan of agricultural production, it is projected that the planting acreage in 1956 will be so increased that in 1958 the harvested acreage could reach 5,000 ha., with a unit-area yield of 4,500 kg/ha. If attained, the total output of molasses-sugar in 1958 will be 22,500 m/t. The acreage thus increased will be taken from those planting sweet potato; and the shift could be made without difficulty if the export price of molasses sugar become higher.

The amount of molasses sugar for domestic consumption fluctuates around 3,000 m/t a year. Local retail price exerts negligible influence on the local demand. However, if the price disparity between white-sugar and molasses-sugar become significant, there could be a shift of demand in either direction. Under normal price fluctuation, if taking 2,000 - 8,000 m/t as range in domestic demand, adequate amount of molasses sugar could still be made available for export, if increase of output could be duly accomplished. That increase must be inspired through better NT\$ price from export market.

The 38 mills now existing have a total crushing capacity of 48,000,000 kg. of cane, which, at 12% sucrose content, will give 46,541 m/t of molasses sugar. No more capital investment shall be needed for additional provision of processing facility, to ensue an increase of sugarcane production.

The existing Brown Sugar Manufacturers' Association comparatively speaking, is well-organized and efficiently operated. Most of the millowners are exporters at the same time. After the V-J Day, through the strenuous effort made by the Association, the import-export channel of molasses-sugar was restored between Taiwan and Japan in 1951.

Japan consumes annually 80,000 m/t of molasses sugar of which 20,000 m/t come from local supply and another 20,000 m/t import from Ryukyu Islands. The other 40,000 m/t are divided between India, Philippine and Taiwan. India is gradually losing the market because of the inferior quality of its sugar, its poor packing and uncertainty of its delivery. On the other hand, owing to the high quality of its sugar, its proximity and better trade-relationship, Taiwan could develop an export potential of 20,000 - 40,000 m/t a year in the Japanese market.

In the trade-agreement between China and Japan the quota for molasses-sugar was set at 10,000 m t for 1953. Imports outside the quota were procured with U.S. dollars retained by Japanese exporters. The Japanese Government, in an effort to boom its export, allowed its exporters to retain part of the foreign

currency to import commodities at their choice.

2. Rice

During the Japanese occupation, rice produced in Taiwan was a very important export item. In the period of 1934-1938, an average of as much as 680,000 m/t of rice were exported annually. In recent years, however, the annual export was dropped to about 100,000 metric tons as there has been a rapid increase of population on the island and about 200,000 m/t of rice are required annually for the consumption of the armed forces alone. The present food policy of the government is to produce enough food primarily for meeting domestic consumption and urgent need and secondarily for export.

In the total value of exports from Taiwan, rice is second only to sugar. If rice export can be substantially increased, it certainly would earn more foreign exchange and benefit the whole economy on the island. But prospect of a great increase in rice export is rather dim. Although there has been great increase in rice production in recent years through the increase of both rice acreage and unit yield, this increase was largely offset by the increasing demand of domestic consumption. It is possible, however, to increase the annual rice export to 200,000 m/t in three or four years if notable achievements are made from the substitution of cheaper foods for rice and if the rice crops are good.

The rice needed for rations and export is collected by the government through a number of collection programs, such as the collection of rural land tax in kind, sale of land, bartering rice for fertilizer, and others. The export of rice is handled by the Provincial Food Bureau which designates the Central Trust of China as its sole agent, and hence there is no link between rice price in the international market and farm price. The export is made mainly to Japan to exchange chemical fertilizer and other needed commodities and the fertilizer is, in turn, distributed to farmers for rice production.

In the case of rice export, an adjustment of the present foreign exchange rate can only benefit the government. It will bring no effect on farmers in so far as the existing barter ratios between rice and fertilizers are maintained for fertilizer, distribution; but if the adjustment of foreign exchange rate is followed by a change in the barter ratios so that more rice is required for the fertilizers, it would certainly bring adverse effect on farmers as the cost of rice production will be increased. This will handicap rice production and affect also the quanti-

ty of rice available for export. However, an increase of farm price of paddy will have medium effect on farming intensity of rice, but small effect on its acreage expansion.

The prospect of rice export from Taiwan depends largely on (1) the potentials of increase in rice production through increasing intensity of cultivation and expansion of acreage; (2) population increase of the island as a factor affecting domestic requirement for rice; (3) the possibility of substitution of cheaper foods for rice and (4) the demand for and price of rice in the international market. It is generally agreed that the hope of increased production depends primarily on increased yields and expansion of acreage through improved irrigation. The total area under rice in 1952 was 785,730 hectares for two crops with an actual area of about 460,000 hectares of paddy field. Present information indicates that it is possible with future irrigation development to convert 100,000 ha. of one crop rice fields into double cropped fields, 60,000 ha. of dry land into one crop rice fields, and another 60,000 ha. of dry land into double crop rice fields. The main means of achieving this additional irrigation is to build reservoirs for storing the water during surplus rainfall so as to supply water in periods of deficiency for beneficial use. By the application of additional fertilizer, the improvement of farm practices and the introduction of better varieties, it appears possible to further increase the present unit yield of about 2,100 kg of brown rice per hectare per crop.

The government has set in its Four-Year Production Program 1,650,000 m t and 1,760,000 m/t as the production goals of rice for the first two years beginning 1953. JCRR rice experts estimate that rice production in Taiwan can be possibly increased to 1,810,000 m/t in 1955 and a record of 1,850,000 m t in 1956. With little knowledge of the financing situation of the government 3 years from now, it is rather difficult to project rice production beyond 1956. However, it might be said that further increase of rice production over the 1956 goal of 1,850,000 m/t is quite feasible.

The growth of population in recent years has been very rapid due to the high natural rate of increase (net 3-3.5% per year) and the considerable number of immigrants. It seems unlikely that the current high natural rate of increase in population could be long maintained; nevertheless at least in the coming five to ten years, the population seems destined to increase at a higher rate than will rice production. Thus, population growth must be considered as a factor unfavorable to increasing rice exports in the future.

The aggregate effect of substitution of cheaper foods for rice, mainly wheat flour, corn, barley and sweet potato, is expected to be favorable for releasing rice for export market. Wheat, corn and barley are considered good substitutes for rice both from economic and nutrition standpoints. Sweet potato is one of the most commonly used substitutes for rice, but it should not be substituted extensively for rice in human diet because of its low protein content and difficulties in handling and storage. It is advisable to persuade people to have more varieties of basic food in their daily diet. If the government would undertake an active program to 1 educate the people in the need for greater consumption of grains other than rice, and in the best techniques of preparation, 2 import wheat or wheat flour, corn and barley, and 3 provide price incentives to induce their consumption, undoubtedly there would be a significantly large substitution of cheaper foods for rice, thus releasing rice for export.

With respect to future prospects in the international rice market, it would be foolhardy to make firm forecast; yet there are reasons to believe that the demand for and price of rice both may follow a slightly downward trend over the next few years, despite continued population increases. In most rice-consuming countries, governments are actively promoting more efficient rice production, and are encouraging the substitution of cheaper grain and other starchy foods for the high priced rice. However, in the near future there should be no serious effect on the export of Taiwan rice to Japan because: (1) the amount for such export is rather small as compared with the total rice import in Japan; 2 the Japanese usually favor Taiwan Ponlai rice and pay a premium price for it and there has been a close tie between Taiwan rice and Japanese market; (3) the proceeds are paid in barter credit instead of free dollars.

Taking all the above-mentioned economic factors into consideration, it is felt that the possibility of increasing rice export from Taiwan in the coming few years is limited. There is presently enough rice in Taiwan even though the current rice consumption standard is rather high. Rice exports will be largely dependent on government policy. If the government should revise its food policy so as to induce people to consume more cereals and starchy foods other than rice, include some wheat flour or sweet potatoes or corn or barley in its ration programs, and stop the practice of stabilization sales, it seems possible that more rice may be available for export.

3. Canned Pineapple

Although canned pineapple has been one of the important export commodi-

ties of Taiwan, its annual export had never reached one half of its production in the years 1946-1953. The total production of canned pineapple in 1954 is estimated at 60,000 m/t, of which about 30,000 m t may be canned and exported. As demand for pineapple in the domestic market is elastic, it is quite possible to divert a part of domestic consumption for export following the increase of farm price of raw pineapple.

The standing formula for the Taiwan Pineapple Corporation to fix the price for purchasing fresh fruit from farmers is to deduct from the NT\$ price per case receivable from export the expenses for processing, management, etc. and pay farmers within the limit of what is left. An increase of exchange rate would enable the canneries to pay a better farm price for raw pineapples and thus stimulate more production, and give canneries a better control over the supply of the raw fruit.

The total estimated output of canned pineapple in 1954 is about 70-80% of the total capacity of processing plants of Taiwan Pineapple Corporation and private corporations. However, the processing of pineapple in Taiwan is usually limited by the supply and availability of tin plates which are imported and considered a scarce factor in pineapple processing. A raise in the foreign exchange rate will increase the NT\$ cost of tin plates and hence will increase the export cost of canned pineapple.

The elasticity of demand for canned pineapple from Taiwan in foreign markets is quite large. The canned pineapple produced in Taiwan is of a quality considered as good as that produced in Hawaii, while its price is cheaper. Hence, it has enjoyed a good sale in many countries. The exports of Taiwan canned pineapple are largely made to West Germany, England and Japan. While no accurate data are available, it has been estimated that the exports to these three countries occupied 80%, over 80% and over 50% respectively of their total imports of the item. So far, Taiwan has not been able to meet the demand from West Germany. While it is estimated that Taiwan will have no trouble in exporting 1,000,000 cases, its export in 1953 was only 523,000 cases. Beyond the 1,000,000 case mark, the limiting factor for the expansion of export of canned pineapple will be the foreign exchange control imposed by many countries. Although canned pineapple is not a restricted item for import in these countries, there has been strict control over the allocation of foreign exchanges for its import.

4. Refined Tea

- A. Currency deflation tends to stimulate tea production and export owing to its reflection on farm and market prices.

During the past five years, because of over bidding among tea processing plants for raw material (fresh leaves), it has become a bonanza to Taiwan tea growers. The buying spree has been accentuated by the "Blue Card" system which ties in imports with exports, resulting in an even more bullish market for fresh leaves. It can be safely said that tea farmers are especially benefited by such a situation. Unlike tea factories in other countries, which rely upon their own plantations for fresh leaves, tea factories in Taiwan are numerous and, excepting Taiwan Tea Corporation, they have to compete for raw material from small tea gardens. This situation is likely to continue in favor of the tea growers as long as the demand remains to be greater than supply.

- B. Effects of intensive culture practices on increasing production with quality improvements

1. Fertilizer:

Excepting about 800 hectares of tea plantations in Yutse and Puli area where the application of chemical fertilizer (250 kgs. per ha. of calcium cyanamide is already universal, the usage of chemical fertilizer in other hsien is still in a demonstration stage. Under various conditions, such demonstrations indicated a 10-20 percent increase in yield of fresh leaves. If the price of fresh leaves continue to be favorable, the application of fertilizer to tea will pick up momentum as a result of the present demonstrations.

2. Labor:

A great deal of labor is required to build up and maintain terraces for controlling erosion and conserving soil moisture. Labor is also required for cultivation which is conducive to higher yield.

Similarly, more labor is required for plucking which may affect both quality and quantity of the tea produced. With finer or lighter plucking quality, the tea will be improved at the expense of quantity, conversely, a sizable increase in output is feasible by coarser plucking and by the application of more fertilizers.

- C. Possibilities of acreage expansion

Agricultural statistics put the total area in tea on Taiwan at 43,000-44,000 hectares in round figure, including about 800 hectares of Assam varieties now grown exclusively in Central Taiwan.

Because of higher yield of Assam varieties which average 3,000 kg. per hectare of fresh leaves, as compared with the 1,200 kg. averaged for the indigenous varieties; and because the Puli Sugar Mill has recently been closed, there are at least about 2,000 hectares which are suitable for growing Assam tea varieties with equal success as Yutse Hsiang. In fact, JCRR has already embarked upon a 3-year program of raising 2,000,000 seedlings annually to plant 900 hectares by the end of 1958.

Although the acreage for indigenous varieties in Miaoli, Hsinchu and Taoyuan Hsien could be further expanded by taking over the areas now in citronella, the immediate problem now confronting these districts is to increase the per unit area production (yield) from 1,200 kg. to 3,000 kg. This could be accomplished through continued rejuvenation of old plantations, planting better or selected indigenous varieties, by demonstrations and universal application of chemical fertilizers, and by other improved culture methods.

D. High percentage of export volume as compared with total production.

About or over 90 per cent of Taiwan's annual tea output is generally exported, which means that the export business is rather inelastic. But the immediate problem, which is now confronting the Taiwan tea industry, is to find a market outlet for Taiwan tea.

Because demands for the more delicate black "congou", oolong, and green teas had been declining for many years owing to a shift in consumer preference to a stronger black tea produced in India, Ceylon, and the Netherland Indies; and because of the disappearance in 1950 and sudden reappearance in late 1953 of Mainland China green teas, Taiwan tea industry has been forced to drift into a precarious position of shifting around in the production of green tea or black tea from time to time. This usually depends upon what "make" of tea is short or in demand.

The shift to green tea production was made in 1950—1953 when practically no black tea was made, excepting those produced by the Taiwan Tea Corporation. Then by October, 1953, the Communist China suddenly put several million pounds of green tea on the world market. As a result, 4 million pounds of Taiwan green teas were reported to be left over on the hands of tea traders and exporters.

A reverse shift was made in 1954 going back to the processing of black tea. It was started, of course, on the strength of a rising black tea market when a sizable quantity was contracted by the Brazilian Government. On the other

hand, since the signing of the Sino-French Trade Agreement, Taiwan has not been successful in selling any green tea to French-Morocco.

E. Supplies and facilities of processing equipment and limitations if any.

Despite the repeated shifts in production within a short period of only five years, there was never any wholesale conversion or reconversion. Only simple green tea processing equipment was installed, while the original black tea making machines were simply mothballed, or vice versa. Nothing has ever been scrapped. In other words, the production capacity has been greatly increased. It might be easily further increased because additional equipment can be manufactured locally.

The only limitation is the financial burden involved in keeping two sets of equipment. Until the Taiwan tea industry comes of age with a stronger determination and more intelligent planning, it might have to keep two sets of processing equipment.

F. Elasticity of local tea consumption

Local consumption of tea is quite inelastic. Price range varies greatly according to different grades. A cup of tea in China is still one of the least expensive of all beverages. On the other hand, the top grade may be the most extravagant drink for connoisseurs, as tea drinking has become a habit so firmly established among users that the response of tea consumption to changes in income of the consumer is not pronounced.

G. Influence of higher farm prices on quantity of export and local consumption.

The effect on both export and local consumption due to higher farm price will be indirect because the major types of teas (black or green) which are suitable for export, are not generally consumed locally. Oolong, Pao-chung and scented tea, which are manufactured in sizable quantity for the over-sea-Chinese trade in Hongkong and South Sea Island, are the favorites of the local populace. Sufficient quantities of these "makes" shall always be produced to meet the demand of this group and satiate its drinking habit.

H. Organizations of producers and exporters

Unlike other producing countries, the plantation system of operation in Taiwan is rather an exception than a rule. Aside from the Taiwan Tea Corporation which has several large plantations, other processors do not have large plantations and have to rely on small tea growers for their raw material (fresh leaves). Paradoxically, this is the strength as well as the weakness of the

Taiwan tea industry. This constitutes a vicious circle, from which the Taiwan tea industry has not been able to pull itself out. (The Taiwan Tea Guild is too weak to bring agreement among its members on the purchasing price of fresh leaves from tea growers. Keen competition to get hold of raw material often resulted in reckless buying. The growers, realizing the getting rich quick opportunity, resorted to coarse or heavy plucking at the expenses of the next "flush" or future yield, which is getting lower and lower as the practice continues, creating a permanent shortage of fresh leaves. The evil is thus perpetuated.

5. Banana

The export of Taiwan banana is made almost entirely to Japan. It encounters no competition in the Japanese market and the price there is generally good. In the past several years there had been virtually no restriction over its imports from the Japanese Government, as it was imported by many organizations in the name of charity. The boom in its export has resulted in great increases of both its acreage and production. Since last year, however, the Japanese Government has accepted only such imports that fall within its assigned quota. Japan may agree to take further limited imports of Taiwan banana outside the assigned quota, but under the present link system such imports from Taiwan can only bring back a few designated commodities from Japan. Consequently, the export of banana to Japan has dropped and there is now over-production.

The problem in banana export is not a problem of price, but a problem of market. If more markets can be found, there is no difficulty to export more banana from Taiwan. As no processing and scarce factors are required or involved in banana export, increase in production could be easily converted to export market. Before World War II, the export of banana from Taiwan had once reached more than 70% of its total production. After restoration, the export of banana was on the average less than 40% of its total production. Therefore, the potential of diversion from domestic consumption for export is promising provided market is available. It is unlikely that Japan will relax its restriction over the import of Taiwan banana in the near future and hence the prospect for increasing its exports is dim. Hongkong is possibly another market for Taiwan banana, but there is keen competition from Kwangtung banana and the price is not good. Another prospective market which should be explored is Ryukyu Island where is stationed the U.S. Military Force. Under the present circumstances, it can only be hoped that the local exporters avoid

the keen competitions among themselves so that the price of Taiwan banana will be maintained at a reasonable level in the Japanese market.

As efforts have been made by the government in recent years to reduce banana acreage and production, it is unlikely that a raise of the foreign exchange rate will increase the total production. It is possible that a raise of the exchange rate will increase the price of banana in the producing areas and the exporters' profit, but it can hardly affect the elasticity of banana export as it is limited by the market and import quota of importing countries.

6. Citronella oil

The citronella oil produced in Taiwan is 100 per cent for export. It is of a quality about the same as the products of other countries and meets keen competition in the international market. Its chief customers are the United States, West Europe and Japan.

A raise of the foreign exchange rate will increase the price of citronella oil in producing areas, but will not necessarily increase its acreage of plantation as the government is making efforts to reduce its area because of its bad effects on soil erosion. It is possible that its planting will be more intensive and that greater efforts will be made by farmers to increase its unit yield and to improve the quality of citronella oil.

As the export of citronella oil is always influenced by the change of its price in foreign markets, as its price in producing areas is always controlled by the exporters, and as citronella planting has done great damage to soil conservation, it is advisable that citronella oil be included in the list of controlled items for export so that appropriate plans may be made for production of this crop, its export be adjusted according to the demand conditions in foreign markets, and farmers in the suitable production areas be protected with a reasonable price.

7. Citrus Fruits

It has been very difficult for Taiwan to export citrus fruits in the last several years. Citrus from Taiwan competes unfavorably with that from other producing areas because of the lower grade of fruits. The quality of fruit, however, may be improved by better cultural methods, pest control, picking and storage. The export of citrus fruits to Hongkong last year was made with a government subsidy of 20 per cent of their FOB price, but the exporters still suffered a great loss due to the unrealistic exchange rate.

The citrus fruits produced in Taiwan are now mainly for domestic consumption and their domestic price is much higher than their export price. Current esti-

mate places 90% of total production for domestic market and 10% for export. The demand for citrus fruits in the domestic market is quite elastic. If their export becomes profitable, a large portion of citrus fruits can be shifted for export. If the price of citrus fruits in producing areas is considerably raised, less quantity will be consumed in the domestic market. Under the present condition, a raise of the present foreign exchange rate may help the export of citrus fruits, as it will lead to a raise of price in producing areas and domestic market and therefore, more citrus fruits may be diverted from domestic market for export. The increase in price may be followed by an increase of unit yield and acreage of plantation as farmers will pay greater attention to their citrus grove management and pest control. The export elasticity of citrus fruits seems quite great.

8. Feather

Around 60-80 per cent of the export's dollar goes to the producers of feather - mostly poultry raisers, or farmers - and competition among feather exporters is very keen, so that it can be safely assumed that major portion of a rise in its price would be reflected to raisers of farmers.

Production of feather is rather concentrated in the months (lunar calendar) of July and January when many festivals are observed in the province.

The physical volume of feather production depends upon the number of ducks and geese available for killing. The most decisive factor determining the number of ducks and geese is the prices of feed, paddy rice, sweet potato and other grains. The price of feather, which is really a by-product, is apparently not an important factor in determining the number of ducks and/or geese a farmer would raise, though sometime in the past the price of feather amounted to as much as one-fourth of the price of the duck or goose itself. The price of feather, however, is certainly the decisive factor in farmers' determination of how much feather be kept for sales to exporters.

On the average, five ducks or three geese can yield one pound of exportable feather (down included.) The annual number available for slaughtering in Taiwan is three times as big as the number at the end of the year in the case of duck and 1.5 times as big in the case of goose. A table showing possible maximum and actual production and export of feather in the past three years follows:

	1951	1952	1953
Possible maximum production	1,070,896 kg.	1,074,890	1,170,225 (A)
Actual production (kg)	?	790,472	464,483 (B)
Export (kg)	975,735	717,258	387,374 (C)
Export value (US\$)	1,839,365	1,563,728	768,322
(B÷A) 100	?	73.53	39.69
(C÷A) 100	91.11	66.72	33.10

If the duck and goose population in Taiwan remain at the 1953 level, the possibility of increase of export over the peak in 1951 is likely to be very small; if calculated at the present (Aug. 26) floor price of feather for export, the total maximum value of export will not be much over US\$1,000,000. (Present floor price: US\$0.40 per 1 pound for duck, US\$0.52 for goose, and US\$2.25 for down).

The processing is simple and the processing equipment is not costly. The present processing capacity is sufficient to meet the requirement of possible expansion in the foreseen future.

Consumption of feather in Taiwan is negligible, regardless of its price.

The production, marketing and export structure will not impede export., or it would be most properly said that the whole feather industry set-up is for export of feather.

Around 90 per cent of Taiwan's feather export goes to the U.S. No destination market situation information is available, even from the U.S. Embassy in Taipei, but it is believed in the feather exporter circle that, if the price is reasonable, there would be great expansion in feather export from Taiwan.

9. Bamboo shoots and bamboo poles

As there are many natural bamboo forests on the island, the bamboo shoots and bamboo poles exported are only fractions of their production. It is regrettable that because of low price many bamboo products are left rotten in the forests and are not made proper use of.

The exports of bamboo shoots and bamboo poles are now made only to the United States. We have neither the data showing the importance of these exports to the U.S. requirements, nor the information whether they have met any competition in the U.S. market. It is, however, generally considered that the potential of their exports is considerably great, especially the export of canned bamboo shoots which are liked by the overseas Chinese. If the prices of these products are increased, not only their exports to the United States can be considerably increased, they can also be exported to other countries where there are overseas Chinese with the assistance of Chinese consulates and embassys.

A raise of the present foreign exchange rate will quite possibly increase the export of these products, as it will raise their prices in producing areas and the exporters' profit. It will not adversely affect their domestic consumption, as the demand for them is inelastic. It involves no problem of production expansion, as there is abundant supply of them in the natural bamboo forests.

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