

REPORT TO THE CONGRESS



*BY THE COMPTROLLER GENERAL
OF THE UNITED STATES*

Providing Economic Incentives To Farmers Increases Food Production In Developing Countries

Department of State

Agency for International Development

In light of today's food crisis, this report discusses why developing nations need a comprehensive strategy which emphasizes economic incentives to farmers as the keystone to improving agricultural growth. It analyzes some of the elements that such a strategy must entail.

GAO recommends that the United States join with other donors and assist developing nations to devise an agricultural strategy suited to their needs. Priority should be given to using external aid for this purpose and to expanding indigenous institutions and building infrastructure necessary to implement these strategies.



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

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To the President of the Senate and the
Speaker of the House of Representatives

This report, which is part of our series on improving the world food situation, discusses the need for developing countries to adopt a comprehensive development strategy which emphasizes incentives to farmers as a basis for improving their agricultural production. In our previous reports we concluded that the developing countries must work toward becoming self-sufficient in food production. In this review, we examined a developing country that has been successful in increasing its agricultural production to identify those factors which made the success possible.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Director, Office of Management and Budget; the Secretary of State; and the Administrator of the Agency for International Development.

A handwritten signature in cursive script, reading "James A. Stacks".

Comptroller General
of the United States

C o n t e n t s

		<u>Page</u>
DIGEST		i
CHAPTER		
1	INTRODUCTION	1
	Scope of review	2
2	NEED FOR A COMPREHENSIVE AGRICULTURAL DEVELOPMENT STRATEGY	3
	Local and national planning	4
	Pricing and marketing of farm products	5
	Land reform measures	7
	Institutional development	10
	System for supplying needed inputs	17
	The success of Taiwan's comprehen- sive strategy	23
3	CONCLUSIONS AND RECOMMENDATIONS	28
	Conclusions	28
	Recommendations	28
	Agency comments and our evaluation	29
APPENDIX		
I	Selected recent work by GAO in the international food area	31
II	Letter dated January 19, 1976, from the Acting Auditor General, Agency for International Development	32
III	Principal officials responsible for activities discussed in this report	35

ABBREVIATIONS

AID	Agency for International Development
DAIS	District Agricultural Improvement Stations
GAO	General Accounting Office
JCRR	Sino-American Joint Commission on Rural Reconstruc- tion

ABBREVIATIONS

PDAF Provincial Department of Agriculture and Forestry

SAFED Sino-American Fund for Economic and Social Development

UACP Unified Agricultural Credit Program

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

PROVIDING ECONOMIC INCENTIVES
TO FARMERS INCREASES FOOD
PRODUCTION IN DEVELOPING
COUNTRIES

Department of State
Agency for International
Development

D I G E S T

This report discusses the importance of a coherent and comprehensive agricultural development strategy emphasizing adequate economic incentives to farmers as a basis for promoting agricultural growth in developing nations and describes how a developing nation has achieved tremendous success by adopting a strategy which suited its needs and which was based on a system of incentives.

GAO recommends that the Secretary of State and the Administrator, Agency for International Development

- work with other donor nations to help each developing country establish a comprehensive strategy for developing its agricultural sector which best suits its needs and which emphasizes incentives to farmers and the effective use of resources and
- seek agreement among donors to give greater emphasis to the use of their economic aid to help each developing country improve its agricultural strategy and build the necessary infrastructure to carry out these plans. (See p. 28.)

GAO's work in Taiwan and other work in the food area, particularly that in countries visited during a review of disincentives to agriculture production, shows that a comprehensive agricultural development strategy must at least consider:

- Local and national plans and programs which maximize use of resources. (See p. 4.)
- Assured markets to absorb farmers' excess production at stable prices, high enough

to make using improved seeds, fertilizer, irrigation, and pesticides profitable. (See p. 5.)

- Rural land reforms which allow the cultivators of land to benefit from increased output. (See p. 7.)
- Institutions that will promote agricultural production increases by formulating agricultural policies and programs, providing for the effective use of external aid, creating marketing systems, instituting irrigation projects, etc. (See p. 10.)
- A system to insure the inputs that are essential for increased production (including the development of technology tailored to the unique conditions in the country, adequate amounts of fertilizer, and credit to finance these improvements) are available to all farmers. (See p. 17.)

The Republic of China (Taiwan) has devised policies and programs to develop each of the above key elements in its agricultural strategy.

As a result, Taiwan maintained an average agricultural growth rate of 4.6 percent during 1953-72. This was far above that of other developing nations, thus enabling the country to attain basic self-sufficiency in food. (See p. 23.)

Taiwan's strategy spread most of the benefits of agricultural development among small farmers, a target group which is only today beginning to receive priority attention in world development circles.

This strategy was designed to fit Taiwan's special circumstances (such as a highly educated populace, a lack of landowner political power, and an infrastructure set up during the Japanese occupation).

What the developing country must do then is design its own strategy to address each of the agricultural problems in that country.

The Department of State and the Agency for International Development agreed in principle with GAO's conclusions and recommendations but pointed out that the Taiwan strategy does not necessarily provide a model that can be duplicated in other developing countries.

GAO is not suggesting that the specific techniques followed by Taiwan be duplicated in all developing countries; GAO's message is that developing countries must adopt certain key elements if their agricultural development is to reach its potential. The broad principles that were identified in GAO's review are universally applicable.

CHAPTER 1

INTRODUCTION

Our report to the Congress entitled "Increasing World Food Supplies--Crisis and Challenge" (ID-74-4, Sept. 6, 1974) examined the food situation and pointed to the need for developing countries to take appropriate self-help measures to increase domestic food production.

In a second report in the series on food, "Disincentives to Agricultural Production in Developing Countries" (ID-76-2, Nov. 26, 1975), we reported that one of the major factors preventing developing countries from achieving greater increases in agricultural production had been government policies and institutions which did not provide adequate economic incentives and, in fact, were disincentives to production increases. These policies included:

- Pricing that favored urban consumers by holding food prices down and that discouraged farmers from adopting more expensive improved farming techniques.
- Taxing, such as export taxes that discouraged production for export, that discriminated against the agriculture sector.
- Monetary and trade policies that made food imports attractive but discriminated against food and agriculture exports.
- Restrictions on moving food from surplus to deficit areas, discouraging farmers in the surplus areas from producing as much as they were capable of.
- Credit policies and procedures that worked to the advantage of the large farmer but generally made lower cost credit unavailable to the small farmer, restricting his ability to buy fertilizer, improved seeds, irrigation, etc.
- Extension services that concentrated on export crops rather than working with small farmers to increase production for domestic consumption.
- Forms of land tenure that give the tiller of the land only a fraction of the benefits from increased production.

We concluded that, to increase future food production, developing countries must remove production disincentives and must provide adequate incentives to farmers.

In this report we examine how one country designed a comprehensive development strategy that emphasized economic incentives for its farmers. The Republic of China (Taiwan) faced many of the problems now being faced by other developing countries--rapid population growth, limited land resources, the need for irrigation improvement, and the demand of industrialization. In spite of these obstacles, Taiwan's strategy of insuring that individual farmers receive the economic rewards for increasing their farm production resulted in a steady increase in agricultural production.

While Taiwan's strategy is only one method of increasing domestic food production, this case study demonstrates that a country can successfully increase its food production when it insures that individual farmers receive economic rewards for increasing their farm production.

The successful strategy used by Taiwan was designed to fit the special circumstances in Taiwan (such as a highly educated populace, the lack of political power of the landowners, the infrastructure set up during the Japanese occupation). What the developing country must do then is design its own strategy to address the unique conditions existing in that country.

SCOPE OF REVIEW

We examined studies by economists and agricultural specialists and documents published by U.S. agencies and international organizations. We visited Taiwan in May and June 1975, held discussions with individuals and representatives of organizations in the agricultural sector, and visited various regions to observe farming conditions.

This report is a continuation of our work in the food area and is based in part on prior work. This includes our examination of the overall world food situation and detailed work in the areas of land reform, storage and distribution systems, fertilizer, and governmental policies and institutional factors that act as disincentives to increased agricultural production. A list of recent work by us in the international food area is contained in appendix I.

CHAPTER 2

NEED FOR A COMPREHENSIVE

AGRICULTURAL DEVELOPMENT STRATEGY

A farmer's decision on the amount of food he will strive to produce may be affected by the economic and social conditions under which he lives. The essential conditions for a positive attitude toward expanding production are political and monetary stability. Factors which can serve as incentives include prices, land tenure, marketing facilities, credit, and taxes. Some of these factors, such as transportation, storage, and communications, are a basic part of a marketing system and can be improved only through economic development. Other factors, however, are controlled by the government and can be adapted to meet various goals.

To increase its domestic food production, therefore, the developing country must design a strategy to insure that these various factors will act as incentives rather than disincentives to increased agricultural production. Because all the aspects of rural development are so interrelated, the strategy must be comprehensive and must consider relationships among the various factors. Otherwise, the incentives may not be effective. One part of the government may be striving to increase production by making sure the farmers are receiving adequate prices for their crops while another part may be offsetting this incentive with a taxing policy. In another case, the economic benefits generated by a pricing policy may not be reaching the person who is actually cultivating the land and therefore may be providing little incentive for increased production. As another example, it would not be practical to devise a method for distributing improved seeds if steps had not already been taken to assure that the farmer could obtain adequate fertilizer and that necessary irrigation facilities had been developed so that the improved seeds would be used effectively.

Our work in the food area has shown the importance of a comprehensive development strategy that considers:

- Local and national plans and programs that maximize efficient resource use.
- Assured markets to absorb excess production at stable prices that are high enough to make the use of improved seeds, fertilizer, irrigation, and pesticides profitable.

- Rural land reform measures that allow the cultivators of land to benefit from increased output.
- Institutions that will promote agricultural production providing for the effective use of external aid, creating marketing systems, instituting irrigation projects, etc.
- A system to insure that the inputs essential to increased production (including the development of technology tailored to the unique conditions in the country, adequate amounts of fertilizer, and credit to finance these improvements) are accessible to all farmers.

LOCAL AND NATIONAL PLANNING

The developing countries first need to establish basic goals to be achieved during specific periods and devise procedures for reaching these goals. Each country, with assistance from external donors, can select the areas to be given priority attention and design programs to cover any special circumstances. In this way, it produces a development strategy that will be unique to the special conditions in that country.

Taiwan, for example, formulated a series of 4-year agricultural development plans within the framework of its overall economic planning. For the first 4-year plan, Government agencies were required to establish goals for each county after consulting local people and considering local conditions. This process was repeated each year, and adjustments were made to reflect changing production and market situations at home and abroad. These adjustments were especially important for such export commodities as sugar, bananas, pineapples, mushrooms, and asparagus.

The first 4-year agricultural development plan was concluded in 1956. Technical improvements were accomplished in land use and irrigation, plant and animal industry, and forestry and fisheries. Succeeding plans continued to stress increases in agricultural production with special emphasis on exports. The second and third plans (1957-60 and 1961-64) spelled out the need for resource development as a means to increase production.

The same general objectives were again stressed in the fourth plan (1965-68) with the additional aim of creating employment for surplus rural labor and reducing the pressure of farm labor on the limited land resources. The start of this plan coincided with the phasing out of U.S. economic aid.

The impact of rapid industrialization on Taiwan's agriculture was definitely being felt by the time of the fifth 4-year plan (1969-72). The plan called for continuing to increase agricultural production at an annual rate of 4.4 percent. This plan stressed stepping up agricultural research and farm mechanization to accelerate agriculture's modernization. Emphasis was also placed upon coordinating water and land resource use, increasing agricultural investment, expanding markets, stabilizing prices, and increasing farm income by reducing production and marketing costs.

The fifth plan was supplemented in November 1969 with a "new agricultural policy" setting forth 14 measures designed to raise farm output and income by lowering farm costs, improving rural infrastructure, increasing production efficiency, and strengthening agricultural financing and marketing. The Premier announced that the executive branch of the Government would appropriate \$2 billion in New Taiwan dollars (about 50 million U.S. dollars) to carry out these measures and the agencies concerned were instructed to formulate detailed implementation plans.

The purpose of these measures was to permit the agricultural sector to make greater contributions to the general economy and, at the same time, raise the rural people's standard of living.

PRICING AND MARKETING OF FARM PRODUCTS

The most basic incentive for farmers to increase agriculture production is the assurance that there will be a market for their products at a profitable price. Without this assurance, the farmer will be unwilling to purchase the inputs (such as improved seeds, fertilizer, irrigation, and pesticides) and take the risks necessary to increase his production. Most experts feel that the relationship between the prices received for food and the costs of producing it is more important than the absolute level of the prices. Thus, a price that might appear to be a disincentive to production in comparison with the price of the commodity on the international market may actually be an incentive to production when compared with the cost of producing the commodity in that country.

The Government of Taiwan, for instance, feels that an assured market for all the farmers can produce and the reduction of price uncertainty are equally as important as the level of prices in providing economic incentives to the farmers.

In Taiwan, prices for 60 percent of the farm production (including such products as livestock, poultry, fruits, and vegetables) are determined entirely by the market without Government control; the prices rise or fall in accordance with supply and demand. For certain commodities, however, the Government intervenes to keep the prices stable. Thus, while the Government's main purpose is to aid consumers by holding prices down, it feels that controlled prices (as long as they are high enough to make the use of the improved inputs profitable) will aid the farmer by eliminating some of the uncertainty about the return his products will earn.

Methods used by the Government in influencing the prices paid for various commodities include:

- Free market pricing with Government intervention. For some commodities, such as rice, the price is allowed to fluctuate only within limits set by the Government. If the price of rice exceeds the upper limit, the Government will release its stocks on the open market until the price returns to a reasonable level.
- Guaranteed pricing. To encourage sugarcane production, the guaranteed price is announced before the planting season. The farmer is then assured of a certain minimum price that he will receive for his crop. At harvest time, however, the farmer can sell his crop either on the open market or to the Government-owned sugar corporation.
- Contract pricing. For mushrooms and asparagus, the Government allots planting acreages and assigns quotas to each cannery. Collective bargaining between the canners and the farmers, with Government arbitration, determines the prices to be paid for the commodity, and contracts between the canners and farmers are signed before the crop is planted. Modified contract pricing is also used for jute, bananas, and pineapples.
- Official pricing. The Government sets the official price of rice based on a production cost survey and a 10-percent profit for the farmer. This price is used to compute the Government's payments for compulsory rice purchases (about 40 percent of the marketed rice) but does not affect rice transactions on the open market.

Taiwan's policy has been to maintain a reasonable price for rice, the staple food for most of the population, in comparison with the cost of production. By providing reasonably priced food to industrial workers, they have aided

industrial development. The Government of Taiwan controls about 60 percent of the rice marketed by the farmers. It obtains this rice by compulsory purchases from the farmers (at the official price which averages 20 to 30 percent below market prices) as payments for land tax and as repayments for fertilizer distributed under the barter system. The Government disposes of about half of this rice as rations to the armed forces and civil servants and either exports the remainder or sells it on the open market to stabilize prices.

Farm production has increased in spite of these price controls because the use of the improved inputs has been profitable at these prices. Up until 1966 the prices paid by farmers increased at a slower rate than the prices received by the farmers. From 1967 to 1972, however, this trend was reversed and the Government had to correct the situation and insure the continued profitability of using improved inputs. For example, since 1973 the Government has guaranteed the price farmers receive for rice--based on the cost of growing the rice plus a 10-percent profit.

LAND REFORM MEASURES

For an incentive method to be as effective as possible, the economic benefits from increased production must go to the cultivator of the land. In some cases, this means that the land ownership structure must be changed to some extent. Pricing policies designed to act as incentives may be unsuccessful because the actual cultivator of the land does not receive full benefit of the policy. A tenant farmer will be unwilling to invest in costly inputs to increase his production if a large portion of the food produced (or its value) must go to the landowner as payment for the use of the land.

Taiwan's reform program was an essential part of a comprehensive plan to develop the agricultural sector. It helped increase productivity of the available farmland; by giving the farmer the benefits resulting from the increased production, it gave him an economic incentive to produce more.

In 1948, before introduction of land reform, landlords controlled most of Taiwan's land and exacted rents ranging from 50 to 70 percent of the annual crop yield. They often forced tenants to pay rent up to 2 years in advance. The leases were usually unwritten and could be terminated at the landlord's whim.

The land reform program was introduced as a means of fulfilling a policy of allowing farmers to own the land they tilled and enjoy the fruits of their labor. The program had three stages: rent reduction (1949), sale of public land (1951), and a land-to-the-tiller program (1953).

The former director of the Provincial Land Bureau, which carried out the land reform program, said that implementation was staggered to prepare the way for the final goal (land-to-the-tiller program). According to one of the commissioners of the Joint Commission on Rural Reconstruction (JCRR), the program was designed to be implemented with as little landlord resistance as possible.

Rent reduction

The rent reduction program improved land tenure and provided a financial incentive to increase production. Lease rent was limited to 37.5 percent of the standard annual yield for each grade of farmland. The standard yield, which considered soil fertility and productivity, was important since it established in advance the maximum rent. Farmers then had an incentive to increase production beyond the standard because any extra yield belonged only to the tenant. The landlord was thus denied the benefit of extra work and inputs the tenant supplied.

The resulting extra income greatly improved the farmers' livelihood. A former JCRR chairman said the extra income had improved farmers' nutrition, clothes, and housing. In addition, individual farmers could afford to own draft animals. Formerly, they shared ownership.

One of the JCRR's commissioners said the rent reduction program had two objectives--one explicit and one implicit. The program was announced as a means of improving the farmers' standard of living. The unstated objective was to reduce the landlords' interest in owning tenant-farmed land.

Both goals were achieved. As explained above, the extra income greatly improved the farmers' standard of living. Several reports state that landlords were no longer as eager to own the land and were willing to part with it. A JCRR report said that from December 1948 to December 1949, the first year of rent reduction, the average value of paddy and dry land dropped by 19.4 and 42.3 percent, respectively.

The rent reduction program also improved land tenure. All leases had to be written, be registered with the Government, and provide a minimum of 6 years' land use. The assurance of continued land use encouraged the farmers to improve the land. Advance rent payments were forbidden.

Sale of public lands

Sale of public lands was actually a continuation of the initial sales made during 1948. Sales were suspended in 1949

during the rent reduction program and begun again in 1951. The 1948 sales established 7,000 owner-farmers, and the sale proceeds were used to employ people to reclaim public wasteland, thus reducing unemployment.

Public farmlands were sold principally to incumbent cultivators. Tenants or other eligible purchasers were allowed to purchase from 1.2 to 9.6 acres of land, depending upon the grade and whether it was dry or paddy land.

The Government recognized that the success of the sale of public land was directly related to the appraised land value and established the sale price at 2.5 times the annual main crop yield for each grade of cultivated land.

Two methods of installment payments were used. For the 1948 sales, purchasers were allowed five to eight annual installments, depending on the grade and type of land. Because this was too short a period in which to pay the entire purchase price, under the new payment plan, which did not distinguish between types and grades of land, payments were due in 10 annual equal installments. These installments, including land tax, could not exceed the equivalent of rent for the land.

Generally the annual payments were due in two increments coinciding with the harvests. Paddy fields had to be paid for with rice while the cash equivalent for the official sweet potato price was required for dryland. From 1951 to 1966, over 274,000 acres were sold to incumbent cultivators. These sales generated about \$23,250,000, which was used for other land reform programs.

The sale of public land was a successful demonstration of the Government's interest in the land reform program. According to a JCRR commissioner, the land reform program would have been doomed to failure if the Government continued to act as a landlord while it required the sale of privately owned tenant-farmed land.

Land-to-the-tiller program

The land-to-the-tiller program was begun in January 1953 and completed during that year. The landlords were required to sell the affected land to the Government, which resold it to tenant farmers or other qualified buyers. During 1953 about 344,000 acres were purchased and resold to 194,823 farmers. Landlords sold an additional 37,500 acres directly to 28,960 tenant families. Thus, over 223,000 families purchased 381,500 acres of land.

Case-by-case analyses determined the amount of land to be purchased from each landlord, and compensation was set at 2.5 times the annual main crop yield. Seventy percent of the payments were made in land bonds; the remaining 30 percent were paid in stocks of Government-owned industries.

One of JCRR's commissioners said that JCRR decided against cash compensation because of land reform problems encountered in Japan after World War II. Landlords received lump-sum payments which rampant inflation soon made nearly worthless. The former landlords then had neither land nor money.

The Taiwan land bonds for paddy land were redeemable in rice and for dryland in sweet potatoes at 4-percent interest over a 10-year period. The value of the payments was thus maintained by the market price of the commodity.

Four Government-owned corporations--Cement Corporation, Paper and Pulp Corporation, Agricultural and Forestry Development Corporation, and Industrial and Mining Corporation--were sold as part of the land-to-the-tiller program. A JCRR commissioner said this procedure transferred private capital from land to industry, thus providing a base for industrial growth.

The land was resold to the farmer on the same basis as the compulsory purchase price--2.5 times the total annual main crop yield at 4-percent interest over a 10-year period. Rice payments were required for paddy fields, while the cash equivalent of sweet potato market price was required for dryland.

INSTITUTIONAL DEVELOPMENT

For the economic incentives that are provided to the farmer to be effective, the farmer must be able to obtain the inputs, advice, and expertise necessary to increase his production, and he must also be assured that markets are available to dispose of excess production. In most developing countries, however, infrastructure capable of satisfying these needs is either inadequate or nonexistent. In pursuing its overall economic development, the Government should take steps to aid the development of these services and insure that such inputs as fertilizer, irrigation, and the credit needed to purchase these items are available to large and small farmers alike.

In Taiwan the Government worked to assist the development of various institutions to aid farmers. In cooperation with the United States, it established JCRR to program and supervise the use of economic aid the United States provided for the rural sector. The Government also assisted the

development of irrigation associations that establish, maintain, and manage Taiwan's irrigation facilities and farmers associations that provide farmers with numerous services such as warehousing, milling facilities, marketing facilities, fertilizer distribution, and extension services.

Joint Commission on Rural Reconstruction

In most cases developing countries need economic aid to assist in their agriculture development because they do not have the necessary resources, capital, or expertise. In some cases, however, the aid has not always reached those who needed it most, and, as noted in our report on disincentives, many countries have used food aid to maintain a low-cost food policy for their urban population. Such a policy decreases the demand for food produced domestically and therefore acts as a disincentive to increased production. Thus, special mechanisms and plans must be established to insure that aid is used effectively to fulfill the most pressing needs of the country.

The Agency for International Development (AID) prepares a Development Assistance Plan for each recipient country, based on assessments of the key factors and priority problems, to provide for the most effective use of aid funds. AID also frequently reviews and does comprehensive studies of the recipient countries' policies and institutional arrangements to determine the areas that would most benefit from external aid.

In Taiwan, economic aid provided for the rural sector was used effectively because it was channeled through a special organization that was able to exercise close supervision over the projects, reduce red tape to a minimum, and make sure that the assistance got down to the grass roots level. The China Aid Act (P.L. 80-472) of April 3, 1948, contained the provision that up to 10 percent of the funds authorized be earmarked for use by a joint commission to formulate and administer a rural reconstruction program. This organization, JCRR, was established through an exchange of notes between the U.S. Ambassador and the Foreign Minister of China in August 1948 (62 Stat. 2942, 3139).

JCRR was subject to direction and control on the U.S. side by the Director of the AID mission and its predecessor agencies to China. On the Chinese side, JCRR is subordinate to the executive branch of the Government and subject to direction and supervision of the Premier. U.S. technical assistance economic aid, and food aid for rural development to Taiwan was channeled through JCRR, and JCRR acted as the agricultural arm of the AID mission and performed functions normally carried out by food and agriculture or rural development divisions of other AID missions.

JCRR's role in agricultural development has been that of a catalyst. By providing technical and financial assistance, JCRR has been able to give direction to agricultural policies, encourage better project implementation, motivate the initiation of difficult projects, and generate a spirit of self-help among the local agencies. In making either grants or loans to a sponsoring agency, JCRR has been able to exercise close supervision over the stage-by-stage implementation of a project and, since the sponsoring agencies are mostly low-level organizations, has been able to hold them directly responsible for project implementation and accounting of expended funds.

With the phaseout of the U.S. aid program and the closing of the U.S. AID mission in June 1965, the Sino-American Fund for Economic and Social Development (SAFED) was established to provide for using the accumulated counterpart funds (new Taiwan dollars generated by the sale of U.S. aid commodities) for Taiwan's economic and social development. The exchange of notes in April 1965 between Taiwan and the United States (TIAS No. 5782) which established SAFED provided that all such funds, including those available in accordance with credit agreements entered into pursuant to sales (which continued after June 1965) under title I of the Agricultural Trade Development and Assistance Act of 1954, as amended, (Public Law 480) be transferred to SAFED.

SAFED can be used for paying principal and interest on U.S. loans to Taiwan, loans and grants in accordance with the credit agreements made in connection with the sales under Public Law 480, and loans and grants to finance economic and social development (of which at least 15 percent each fiscal year must be allocated to the agricultural sector). In addition, among other purposes, it can be used to pay the salaries and administrative expenses of the Council for International Economic Cooperation and Development (now the Economic Planning Council) and JCRR--the two agencies which plan, operate, and administer the development projects financed by SAFED.

The establishment of SAFED, in effect, provided for continuing JCRR after the phaseout of the U.S. aid program by providing a continued source of funding. The exchange of letters establishing SAFED specified that JCRR would continue its role in agricultural development and outlined the following functions for JCRR:

--Advisor to Taiwan Government in rural development matters.

--Agency for agricultural development programing.

--Agency of external assistance.

--Advisory body on agricultural development problems.

The following amounts have been spent to improve Taiwan's agricultural production.

Fund for Joint Commission
on Rural Reconstruction

U.S. dollars--fiscal years		
1951-65		\$ 10,629,550
Local currency--fiscal years		
1950-65		102,150,450
Funds from SAFED:		
Fiscal years 1966-70	\$46,485,780	
Fiscal year 1971	8,351,900	
Fiscal year 1972	9,105,730	
Fiscal year 1973	9,139,350	
Fiscal year 1974	10,839,290	
July 1, 1974 to		
May 31, 1975	<u>8,918,160</u>	
		<u>93,040,210</u>
Total		<u>\$205,820,210</u>

Other countries have established organizations to foster rural development, but few seem to have achieved the impact of JCRR. In most cases the ministries for community development have been realignments of existing bureaucracies and have lacked flexibility.

JCRR's special features should be carefully analyzed to determine an operating principle that might be applied in other developing nations. One of the most important features is the quality of the people associated with it. Primarily because of salaries substantially above those prevailing in the universities and Government service, JCRR has been able to attract and hold personnel.

There seemed to be a lack of jurisdictional rivalry with other Government agencies because, in a sense, JCRR served the central Government replacing the Ministry of Agriculture, which was disbanded when the Government moved to Taiwan. As a result, JCRR was involved in policy formulation to a degree unique among aid organizations and had an unusual degree of access to all levels of Government.

JCRR worked with social traditions and an agricultural system that had already reached a relatively high stage of

development. Taiwan had a higher rate of literacy than most Asian countries. The hard-working Taiwanese farmers were familiar with improved farming techniques, especially the use of irrigation and fertilizers, and they were not resistant to other forms of innovation. Further, important development institutions, such as farmers' associations, irrigation districts, and agricultural research stations, were already functioning.

Farmers' associations

In Taiwan, Japanese-established multipurpose farmers' associations were effectively reorganized and strengthened into self-supporting businesses to supply agricultural inputs, credit, and technical advice to farmers.

Early associations were organized voluntarily to protect members from being exploited by landlords and to seek land rent reduction through collective bargaining. In 1908, realizing their importance, the Japanese colonial Government legalized the associations and made them government agencies for controlling agricultural production.

After a detailed study of farmers' associations in 1950, the Taiwan Government implemented programs to further their development. The farmers' associations were reorganized to place control in the hands of bonafide farmers; training courses were established along with program planning to improve program management; financial support was provided to develop income-producing services; and a coordinated system of practical research, demonstration, and extension was established to improve the farmers' economic and living conditions. The resulting financially independent farmers' associations acted as a bridge between Government and the farmers for coordinated development of agriculture and the farming community.

In the earlier period of development, warehousing and milling facilities were a major source of income for farmers' associations. A large part of this income was derived from such Government-entrusted services as fertilizer distribution and rice collection and processing. Assisting the associations to develop income-earning capital assets and a market for their services (Government-entrusted services) provided the base for their initial self-sufficiency and gave the Government the channel for distributing and collecting essential farm inputs and outputs. Today, with increased labor costs, these Government-entrusted services are not profitable unless integrated with other services, such as marketing, to get full use of higher cost manpower.

The agricultural loan programs initiated by the Government have been significant in the financial development of farmers' associations, as evidenced by the fact that two of the five associations we visited registered their first profitable year after becoming part of these programs. As of 1973, the 266 associations participating in the loan program had made cumulative loans of \$282 million to 440,000 farm households. Farmers' associations had increased their lending capital by \$20 million as of June 1975--the accumulated interest on these loans.

We visited the Provincial Farmers' Association and five township associations, as well as farm families. From discussions with the managers and staff members of the associations and with farmers, we found a general consensus that one of the keys to Taiwan's agricultural development was the strong central policies and programs, such as the agriculture loan program, which strengthened the associations and improved and expanded such services as credit.

During discussions with various experts on farmers' associations, we were told that their progress and roles in agricultural development since World War II were attributable to:

- The sound framework established by the Japanese.
- Government policy and programs of working within the existing framework to strengthen the associations both technically and financially.
- A relationship with the Government in planning and implementing agricultural development programs in the interest of both the farmers and the nation.

We believe that Taiwan's approach to developing these associations has been very successful and with modifications can be extended to other countries which desire soundly designed and efficiently operated farmers' associations.

Development of water resources

In many nations, irrigation is necessary to increase agricultural productivity because rainfall is inadequate or unevenly distributed. When a country is subject to periodic heavy rains, steps must be taken both to protect the farm lands from flooding and to retain the water for use in cultivating the crops. When the rains alone do not provide adequate water for irrigation, it may be necessary to dig wells so that the ground water can be used for irrigation.

Taiwan receives a large amount of rainfall, but because it is unevenly distributed throughout the island and throughout the year Taiwan had to develop irrigation and flood control projects.

Taiwan's irrigation projects and facilities are managed by 16 irrigation associations. The associations provide water to farmlands, improve existing facilities, and construct new facilities. Each association had numerous irrigation groups and operating stations. The irrigation groups are organized by farmers to maintain irrigation ditches, distribute water, and establish common seed farms for areas ranging from 247 to 370 acres. Operating stations regulate irrigation canal water and maintain the facilities.

Each association establishes its own membership fees within Government-set ranges. These fees, to cover irrigation facility operation and maintenance, range from the cash equivalent of a minimum of 20 kg to a maximum of 300 kg of paddy rice per 2.5 acres per year. The chairman of one irrigation association that we visited said the farmers were not charged for actual water used because of the tremendous cost of installing measuring devices and because it would penalize those with poor land that required a lot of water.

The chairman said that about 98 percent of the members pay their fees. The association must initiate court actions to force farmers to pay because the associations may not stop servicing a farmer for nonpayment of fees since it would be contrary to increased production goals.

Taiwan responded to a severe drought in 1954-55 by adopting rotational irrigation. Under this concept, water is applied in the proper amounts at the proper time in order to conserve water and still assure sufficient production. The former method, continuous irrigation, required a constant flow of water through the rice paddy, except during weeding, fertilizer application, and harvesting. Rotational irrigation can reduce water consumption by 25 to 50 percent. Such conservation measures gain more importance as the struggle for land and water continues between farming and industrial interests.

Irrigation increases the capacity of land to absorb additional inputs. However, the constant flow of water under the continuous irrigation concept causes a loss of fertilizer. Fertilizer loss is therefore reduced under rotational irrigation. Upstream farmers using excess amounts of water were causing water shortages in downstream sections. This does not occur in the controlled water distribution of rotational irrigation because water can be evenly distributed throughout the canal system.

Water conserved through rotational irrigation can be used to extend the area of paddy rice, provide supplemental irrigation for upland crops, or supplement industrial and municipal water supplies.

The many advantages of rotational irrigation also stimulated interest in land consolidation. Areas without land consolidation are subject to poor irrigation and drainage, a shortage of farm roads, and small, fragmented plots of land. Under land consolidation, small, fragmented plots are joined to form a larger area divided into uniform parcels of land. Each farm is then provided direct access to the irrigation canal, drainage ditch, and farm road. The orderly design greatly facilitates rotational irrigation.

One of JCRR's engineers said that land consolidation was very successful on flatland areas. He said it has stopped for the present time because the farmers are opposed to the high costs associated with consolidating slope land.

The deputy director of the Taiwan Provincial Water Conservancy Bureau estimated that one-half of the Bureau's annual budget (about \$2.6 million) is used for irrigation. He also estimated that \$18.5 million is budgeted from all sources for irrigation. In fiscal year 1976, the central Government will provide \$15.8 million in irrigation, drainage, and flood control subsidies while the provincial Government will provide about \$5.3 million.

Irrigation projects which serve up to about 1,235 acres can be constructed by irrigation associations; larger projects are usually undertaken by the Provincial Water Conservancy Bureau. In general, for new large projects, the Government provides grants for 50 percent of the cost and loans for the remainder. Loans are available for 70 to 100 percent of the cost of improvement projects. In addition, JCRR and Land Bank loans are available. Loan repayment terms average 7 years but may last up to 30 years for large projects. Interest rates vary from 6 to 12 percent.

SYSTEM FOR SUPPLYING NEEDED INPUTS

While incentives in the form of price support and land reform are essential in motivating farmers to increase production, progress cannot be made without the coordinated supply of agricultural inputs, credit, and sound technical advice.

Because most developing countries do not have an established system for getting supplies and information to the individual farmers, the government must devise methods to insure that essential commodities, such as fertilizer, are available and that the farmers can obtain adequate credit at reasonable cost. Efforts must also be made to insure that research is aimed toward techniques that will be useful to the farmers and that methods are developed to get this new technology to the farmer and demonstrate its usefulness. Care must be taken to insure that these products and services are distributed equally. Research and extension services should focus on improving subsistence crops, as well as those crops produced primarily for export.

In Taiwan, the Government devised a method to distribute fertilizer which was in short supply so that the most important crops would get the largest share of the available supply and so that distribution was equitable. It also devised methods of using the existing farmers' associations to distribute credit and extension services to the farmers.

Production and distribution of fertilizer

All the fertilizer plants in Taiwan are Government operated, and distribution of practically all products is handled through Government-owned agencies. A fertilizer distribution program for various crops is prepared annually by a subcommittee of the Agricultural Planning and Coordination Committee, Ministry of Economic Affairs. The program covers the fertilizer requirement, time of distribution and foreign exchange needed to import fertilizers. The amount of fertilizer each farmer is entitled to receive is determined according to registered crop acreage.

Fertilizers allocated for sugarcane are distributed to the farmers by the Government-operated Taiwan Sugar Corporation. These fertilizers are released entirely on a loan basis to be repaid without interest after milling of the sugar.

Fertilizer for all other crops is distributed by the Provincial Food Bureau through the township farmers' associations. Following World War II the Government stressed rice production to feed the growing population. A policy of increased production through fertilizer application was selected since it was the fastest, most efficient means. The rice fertilizer barter program was initiated in 1948 to meet this objective. In addition to providing for increased rice production, it gave the Government a system for collecting rice for price stabilization and for distribution to the armed forces and public employees and an equitable method of rationing the limited fertilizer supply.

The emphasis on rice production gives rice the largest crop acreage and the lion's share of fertilizer; therefore, most fertilizers have been distributed through the barter system. The exchange ratio of rice for fertilizer became unfavorable to farmers as world prices for fertilizer dropped in comparison to rice prices during the 1960s and was considered a hidden tax on farmers. Beginning in 1970, fertilizer cash prices and barter ratios were lowered by about 20 to 25 percent over a 3-year period, and the rice-fertilizer barter system was abolished in January 1973. While fertilizer accounted for approximately 25 percent of the rice production costs in the 1950s and 1960s, it currently averages about 11 percent.

Fertilizer available on a cash basis for crops other than sugarcane and rice has always been limited and difficult for farmers to obtain. Even today with a fertilizer supply which has more than doubled and the growing emphasis on production of other crops, fertilizer allocations for other than sugarcane and rice are limited to 80 percent of the recommended application. The Government lifted its allocation system in 1973; however, the shortage on the world market and soaring prices of production requisites led to panic buying by farmers and compelled the Government to reimpose fertilizer allocation.

JCRR was given responsibility for insuring that there was no corruption and that farmers were receiving their fertilizer allocations. Field inspectors assigned throughout Taiwan ascertained that farmers' associations received their quotas and visited farmers on a selective basis to insure they had received and used their allocations. This enforcement program ran for approximately 10 years and, according to a former field inspector, there was very little corruption in fertilizer distribution. After 10 years, the enforcement program was no longer required since farmers were aware of their rights and would report any problems in obtaining fertilizers to the proper authorities.

The fertilizer industry in Taiwan has witnessed rapid growth, as evidenced by the increase in local production from 46,000 metric tons in 1949 to more than 1 million in 1974. Taiwan attained self-sufficiency in nitrogen and phosphate fertilizer in 1967, and except for potash, which cannot be produced locally, no fertilizers were imported from 1969 to 1972.

It is difficult to estimate just how much fertilizer has contributed to foodgrain production. However, agronomists estimate that a 10-percent shortage would result in a 15-percent decrease in yield.

The policy of controlling the distribution and production of fertilizers through Government agencies has resulted in equal access by farmers to this essential input and in development of a domestic fertilizer production capability. This assures the continued supply of fertilizer, which is necessary for keeping up soil productivity--the foremost agricultural problem of Taiwan. In addition, it eliminates the drain on foreign exchange which continued import of large quantities of fertilizers would require.

Introduction of innovations through research and extension

Research and technology supported by farmers' organizations and island-wide extension programs have played an important role in developing Taiwan's agriculture.

Research and extension was established during the Japanese colonial period. Research then was aimed primarily at meeting the rice requirements of the Japanese market. Taiwan's rice yield was sufficient to fill this requirement; therefore, research did not concentrate on intensive land use and cropping methods. Also, extension services at that time were mandated and enforced by the Government. Farmers were told when, how, and what type of seed to plant. The Taiwan Agricultural Research Institute, which included fisheries and livestock; the Taiwan Forestry Research Institute; and four district agricultural improvement stations (DAIS) were established by the Japanese.

When the Government moved to Taiwan in 1949, the existing research institutes were segregated according to research areas and three new DAISs were established. These organizations were placed under the control of the Provincial Department of Agriculture and Forestry (PDAF), and emphasis was placed on research to develop new high-yielding crop varieties and intensive cropping methods to feed the population which had increased rapidly. The emphasis placed on research is demonstrated by PDAF expenditures which increased from \$2.4 million in 1969 to \$4.1 million in 1974 for research at the seven DAISs and seven research institutes.

Taiwan's success in research and extension has been the result of both coordination of these complementary services and the limiting of research to practical experimentation during the early stages of development to meet the needs of the farmers.

Most research in Taiwan is performed by institutions under PDAF. Committees comprised of representatives from JCRR, universities and colleges, and research institutes are

established for each major area of research (rice, upland crops, horticulture, etc.). These committees make the final recommendations to PDAF on which programs should be carried out and by which organization. Working groups comprised of representatives from the DAISs, research institutes, and colleges and universities are also established for each major research area. These groups develop research programs based on problems identified through research and extension workers' knowledge. The research committees meet annually to review papers prepared by the working groups and recommend to PDAF which programs should be carried out. PDAF makes the final decision based on committee recommendations and funding limitations. This process of research planning assures the elimination of duplicative research and the initiation of research on the projects most vital to farmers' needs.

DAISs extend their services in cooperation with the township farmers' associations. These associations are an effective extension network throughout Taiwan. DAISs hold training classes for farmers' association extension personnel; give lectures to farmers; make visits to observe farmers' use of new methods; conduct home economics training programs; and coordinate projects demonstrating the advantages of new seed varieties, planting methods, and fertilizer application.

We visited two DAISs and toured their laboratories and experimental fields. We were told that developing a new crop variety requires approximately 10 years from hybridization to distribution. As part of this process, demonstration crops are grown at the district and township levels to determine such information as planting time, spacing, and fertilizer application. Before harvesting the demonstration crops, field days are held for farmers and other interested parties. Therefore, when a seed is certified for distribution, it has already been demonstrated to the farmer as an improvement over the old variety.

Beginning in 1953 the farmers' associations, with JCRR's assistance, began agricultural education programs for improving farming operations, home economics, and youth training to increase farmers' knowledge and improve their livelihood. Under the current program, new knowledge, skills, and attitudes are passed to the farmer through instruction. Visual aids and reference materials, training meetings, method and result demonstrations, frequent contact with farmers, and use of local leaders and extension clubs and groups have been successful at reaching large groups.

The emphasis placed on extension services is demonstrated in the provincial bylaw governing the organization of farmers' associations which requires no less than 50 percent of their annual net earning be used for extension work. This emphasis is further demonstrated by the increase in expenditures for extension services from \$308,000 in 1953 to \$4,003,000 for 1973. Only 32 percent of the 1973 extension budget was provided from Government and JCRR subsidies.

Although the Taiwan experience provides a pattern for the successful organization of research and extension, it is certainly not the only approach available to developing countries. This experience has, however, demonstrated that it is essential to focus research on the applied level--to meet farmers' needs--to obtain maximum economic returns. In addition, it shows that demonstration and education at the farm level of methods to increase economic returns make it easier to get farmers to adopt new methods.

Credit programs

Beginning in 1955, JCRR promoted a series of programs to improve the availability of credit to farmers and to provide credit more suited to their needs. For example, the project in 1955 loaned money to the farmer for 2 years with 18 percent interest (compared to the prevailing bank interest rate for unsecured loans of 22 percent). These projects tested different methods for getting credit to the farmers, and showed that farmers' associations were the most effective way because they were more accessible to the farmer and because they could coordinate the use of credit with extension service and marketing.

The experience gained by this work resulted in the establishment of an island-wide credit program, the Unified Agricultural Credit Program (UACP), in 1961 using the network of farmers associations to provide credit. As a result of this program, over 90 percent of the farm families on the island have access to supervised credit service.

As reported in June 1974, loans made available to farmers under UACP carried interest rates of 16-1/4 percent per annum for unsecured loans and 15-1/4 percent for secured loans for a maximum of 7 years. The maximum loan was set by each farmers' association. To assist the borrower in obtaining the maximum benefit from the loan, personnel from the extension section of the farmers association provided technical assistance on farming plans and management and the borrower was closely supervised to determine that the loan was used for the proposed purpose and that the plans were carried out successfully.

The implementation of a sound credit program was not only necessary to strengthen the agricultural credit institutions by increasing their lending capital but also to fill the credit gap created by land reform. Before 1950 private money lenders, particularly landlords, played a dominant role in agricultural financing, accounting for 82 percent of farm credit in 1949. Land reform brought about drastic changes in the agricultural credit system. Economic and personal ties between landlords and tenants loosened, and former landlords became less interested in making agricultural loans. This gap was gradually filled by a continuous flow of credit from other sources.

In 1960 private lenders supplied only 43 percent of farm loans, while credit institutions and Government agencies supplied 57 percent. By 1967 the ratio had changed to 20 percent and 80 percent, respectively. As of December 1974, agricultural credit loans made by the Land Bank, Cooperative Bank, and township farmers' associations accounted for over 65 percent of the institutional and Government agency agricultural loans. Therefore, UACP not only helped financially sound associations but also prepared the agricultural credit institutions to fill the credit gap created by land reform.

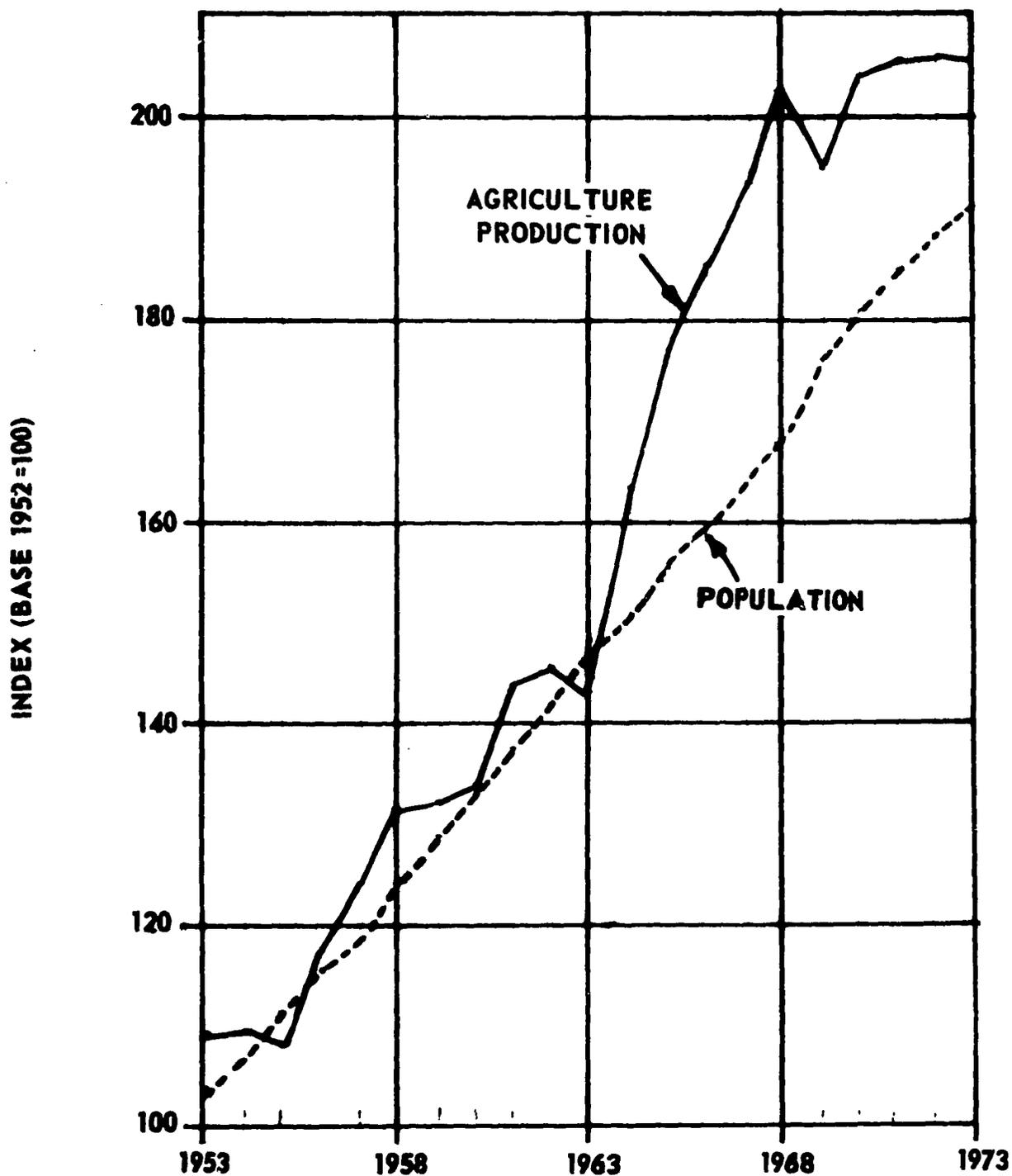
THE SUCCESS OF TAIWAN'S COMPREHENSIVE STRATEGY

Taiwan's comprehensive agriculture development strategy was successful in increasing production. The overall annual rate of increase was 4.6 percent over the 21-year period from 1953 to 1973. This overall rate can be broken down into the following categories: agriculture, 3.5 percent; forestry, 4.3 percent; fisheries, 8.9 percent; and livestock, 7.6 percent. At the same time, Taiwan has been successful in controlling its population growth. Its average annual population growth rate has been reduced from 3.3 percent in the 1950s to under 2 percent for the last 2 years. The graph on the following page compares Taiwan's increases in agricultural production and population from 1953 to 1973.

Taiwan's gains have been significant in comparison with those of other developing countries. For developing countries as a whole, the U.N. Food and Agriculture Organization reported in 1973 that agriculture production had increased at a rate of only 2.8 percent a year from 1961 to 1971 and their population growth rate was 2.6 percent a year. Of the 92 developing countries for which that organization computes production index numbers, 6 experienced declines from 1961 to 1971, and in 36 more production increases failed to keep pace with population growth. Thus, almost half of these countries experienced a drop in per capita production.

TAIWAN'S POPULATION GROWTH AND INCREASE IN AGRICULTURAL PRODUCTION

1953 - 1973



Output of Taiwan's major crops has steadily increased. In 1950 about 1.6 million tons of brown rice were produced from about 1.9 million acres, a yield of about 1,650 pounds per acre. By 1965 production of rice rose by 65 percent to over 2.6 million tons from only slightly more land, the crop yield rising to over 2,710 pounds per acre.

Agriculture has also become more diversified and has helped boost foreign exchange earnings. In 1952 sugar and rice accounted for most of the \$114 million in agricultural exports. By 1972 agricultural exports rose to over \$600 million with large contributions from bananas, tea, mushrooms, asparagus, fruits, vegetables, and fishing and forest products.

Taiwan's agricultural gains have also helped to provide capital for its industrial development. As a result, Taiwan has changed from a predominately agricultural country to a predominately industrial country. Agriculture's share of domestic production declined to about 17 percent in 1974 compared to 36 percent in 1952, while industry's share of domestic production increased from 18 percent to 40 percent over the same time.

Taiwan's development strategy attempted to balance the emphasis given to the industrial and agricultural sectors so that one would not be developed to the detriment of the other. If all the resources had been given to the agricultural sector, industrial development would not have occurred. In the same way, if agriculture had received too small a share of the resources, limited production would have caused prices to increase, and industrial development would have been hindered. In addition, the small incomes of the rural population would prohibit any large domestic demand for industrial goods which would also have inhibited industrial development. Therefore, Taiwan's development policy had two goals: improve the standard of living for the rural population and facilitate the use of surplus agricultural capital to promote industrial development.

This was accomplished to a large degree by the land reform program. Both the rent reduction phase and the land-to-the-tiller phase improved the standard of living of the rural population. The cultivators share of agriculture income increased from 67 percent in 1936-40 to 82 percent in 1956-60. The share going to landowners and money lenders decreased from 25 percent to 6 percent over the same period. This increased income created a demand for industrial products and speeded industrial development.

The land reform program also aided industrial development because it increased the capital available for investment in industry. By limiting the amount of land that a farmer could own, and thereby the amount of capital that would be spent in purchasing it, capital was freed for use by industry. In addition, land that the landlords were required to sell to the Government for resale to tenant farmers was paid for in part by stocks of Government-owned corporations.

Thus, while there were massive transfers of capital from agriculture to industry, it was planned so that it would not hinder agriculture development. Only in the last few years has the rate of agriculture growth declined and Taiwan is taking steps to halt this trend and reduce the earnings gap between rural and urban areas by designing a new 6-year agricultural development plan to increase the earnings of the farmers.

Probably the most important result of agricultural growth is the improvement in living conditions. Comparing the average standard of living in 1972 with that of the 1950s there is a marked improvement. Death rates dropped sharply, indicative of improved nutrition, sanitation, and health services. Per capita real income increased from \$4,277 (new Taiwan currency) in 1952 to \$12,622 (new Taiwan currency) in 1973. Clothing and shoes improved, and brick houses with tile roofs replaced plaster and bamboo houses. In the late 1950s there were no television sets and only a few radios in rural Taiwan; by 1972 most rural households had televisions and electric appliances.

Development of Quemoy

The achievements in increasing agricultural production and overall development in Quemoy (Kinmen) are illustrative of the successful agricultural policies and programs. Quemoy is located about 1-1/2 miles off the coast of mainland China. It is considered a war area, and the natural environment and economic potential cannot, therefore, be compared with Taiwan. Despite these circumstances, the development progress over the past 20 years demonstrates what can be accomplished.

According to local officials, as late as the 1950s Quemoy was a barren, desolate island having no trees and importing over 50 percent of its food requirements from Taiwan. The population increase resulting from the withdrawal from mainland China and the termination of food supplies and daily necessities from the mainland created the need to increase agricultural production for self-sufficiency.

In 1952 an advisory committee on aid to outlying islands was established to provide financial and technical assistance for improving and expanding Quemoy's agriculture. Programs were implemented to increase crop production by introducing superior seed varieties; improve farming techniques, fertilizers, and insecticide applications; construct and repair wells; train technicians; strengthen farmers' organizations; develop agricultural extension services; and extend agricultural credit loans. Emphasis was placed on using specialists to demonstrate improved farming practices to local farmers. From 1952 to 1963, aid projects on Quemoy totaled \$1.5 million.

Today, food production is sufficient to meet the local needs, with the exception of rice which is imported from Taiwan and milled and distributed through the Kinmen Farmers' Association. Our overall conclusion from our trip to Quemoy is that over the past 20 years it has developed from a barren desolate place to a lush, agriculturally productive island which stands as a monument to the success of the agricultural policies.

CHAPTER 3

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

In view of the current world food situation, it is essential that nations take steps to increase their domestic food production. In many developing countries, food production is inadequate to feed the people, the country cannot afford to import as much food as is needed, and other countries are unable to donate enough food to fill the entire gap. Since most developing countries also have rapidly increasing populations, their food gap will increase at an even faster rate in the future. Therefore, everything possible must be done to help them increase their agricultural production.

The government of a developing country should devise a comprehensive strategy that takes into consideration all of the interrelated factors affecting agricultural production and should develop policies and procedures to insure that these factors act as incentives rather than disincentives to increased production. The individual farmer must be able to see that he will receive an economic benefit if he increases his production, and arrangements must be made to insure that all of the inputs, such as credit and fertilizer he will need to increase his production are readily available.

RECOMMENDATIONS

To encourage the developing countries to do everything possible to increase their agricultural production, we recommend that the Secretary of State and the Administrator, Agency for International Development:

- Work with other donors to help each developing nation establish a comprehensive strategy for development of its agriculture sector which best suits its needs and which emphasizes maximum incentives to farmers and the effective use of resources.
- Seek a consensus among donors to give greater emphasis to the use of their economic aid to help each developing nation improve its agriculture strategy and build the necessary institutions and infrastructure to carry out these plans.

AGENCY COMMENTS AND OUR EVALUATION

In their joint comments on this report, the Department of State and AID said that it contains many useful reminders of the importance of incentives and the need for a coherent and comprehensive agricultural strategy in developing countries as a basis for satisfactory performance of the agricultural sector, and they agreed in principle with our conclusions and recommendations.

State and AID pointed out that Taiwan's successful strategy does not necessarily provide a model for other countries which can be duplicated because each country faces unique circumstances which affect its ability to use any particular development philosophy and techniques. They also commented that we have not identified or evaluated the importance of the unique factors that existed in Taiwan and that the report does not add much to the existing knowledge about cause-effect relationships in Taiwan's development that can be extrapolated to situations in other countries.

We did not suggest to AID that the specific techniques followed by Taiwan to carry out an overall comprehensive strategy to increase food production should be used as a model to be duplicated in developing countries. Instead, our message is that developing countries must adopt certain key elements if a country's agricultural development is to reach its potential. During the course of our work directed towards evaluating and improving the world's effort to increase food supplies we noted that one developing country faced many of the same problems as the others but in spite of the obstacles succeeded in steadily increasing food production. We selected this country for a review to identify not the specific methods followed in that particular country but the key elements that contributed to its success. It is the broad principles that had to be considered not the procedures initiated to implement them. We believe based upon our work in the food area that these principles are applicable to other countries. It is these basic truths that we think should be passed on to other countries and we believe that each country should adopt a comprehensive strategy specifically designed to implement them under the unique conditions existing in that country.

The joint comments state that the methodology used by us in conducting the review is inappropriate to the type of study undertaken and that the conclusions do not necessarily follow logically from the data presented. In meetings with State and AID officials we learned that the objection was that our review was performed by talking

with Government officials, who are or were involved with the programs, and by visiting projects and institutions in Taiwan and that the facts were not cross-checked by reviewing all the literature written on the subject. Our review work involved not only meetings with Government officials but also meetings with the farmers themselves. We believe that this method together with the review of a great deal of literature written by scholars on the subject and the analysis of data showing the increases that have been made in food production forms an adequate basis for our conclusions. It should be noted again that State and AID agree with our conclusions and recommendations.

The comments request us to recognize the affirmative actions that the United States has undertaken to improve less developed country policymaking. We have included this information on page 11 of the report. As we pointed out in our report "Disincentives to Agricultural Production in Developing Countries," State and AID agree that more efforts should be devoted to eliminating disincentives affecting developing countries' food production and to providing incentives for expanding production. We believe that carrying out our recommendations will be a step in accomplishing these goals.

SELECTED RECENT WORK BY GAO IN
THE INTERNATIONAL FOOD AREA

Report to the Congress on "Increasing World Food Supplies-- Crisis and Challenge" (ID-74-4, Sept. 6, 1974)

Discusses the principal issues affecting the world food situation and the response needed to deal with food problems.

Report to the Congress on "Disincentives to Agricultural Production in Developing Countries" (ID-76-2, Nov. 26, 1975)

Points out that governmental policies and institutional factors that provide little incentive--or act as disincentives--have hindered developing countries in growing as much food as possible.

Report in process dealing with worldwide relief effort needed to respond to the disastrous famine affecting the Sahel region of sub-Sahara Africa.

Report in process involving the problems of inadequate storage facilities and poor storage practices in developing countries which consume food that is urgently needed to fight hunger and malnutrition.

Review in process to evaluate the effectiveness of small farmers credit program as a method of helping the small farmer and increasing food production.

Review in process relating to the role of fertilizer in increasing food production in the developing countries.

Continuous monitoring of what the United States, the Food and Agricultural Organization of the United Nations, and other international organizations are doing to assist less developed countries in increasing their agricultural production.

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

Jan. 19, 1976

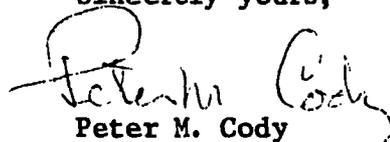
Auditor General

Mr. J. K. Fasick
Director
International Division
U.S. General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Fasick:

Attached are joint comments of the State Department and the Agency for International Development on the General Accounting Office draft report "Providing Economic Incentives to Farmers--Taiwan's Success in Increasing Food Production" sent to us November 14, 1975 by letter from your office. Thank you for the opportunity to provide comments. I hope they prove useful in considering publication of the final report.

Sincerely yours,


Peter M. Cody
Acting Auditor General

Attachment: a/s

- GAO notes:
1. Deleted comments pertain to material presented in the draft report which is not included in the final report or was revised.
 2. Page references in this appendix may not correspond to pages in the final report.

Department of State and Agency for International Development
Comments on GAO Draft Report:

"Providing Economic Incentives to Farmers -
Taiwan's Success in Increasing Farm Production"

The report contains many useful reminders of the importance of incentives and the need for a coherent and comprehensive agricultural strategy in LDCs as a basis for satisfactory performance of the agricultural sector. Basically the report argues that Taiwan implemented a comprehensive set of agricultural policies and programs which provided incentives to farmers to increase production and suggests that other countries should do the same. While we agree in principle with this conclusion, it should be made clear that each country faces a unique set of circumstances which affect its ability to use any particular development philosophy and techniques. Success in Taiwan, while admirable and surely deserving of study, does not necessarily provide a model for other countries which can be replicated.

We agree in principle with the conclusions reached by the GAO and, except for specifically promoting Taiwan as an example to underdeveloped countries that might react negatively on ideological grounds, we can agree to the recommended actions. However, we do not believe the methodology used by the GAO in conducting this review is appropriate to the type of study undertaken nor that the conclusions necessarily follow logically from the data presented.

Much of the report is based on a list of five elements that "a comprehensive agricultural development strategy must consider." We agree that the factors identified are important and would find it useful if the report could more clearly indicate how important they were individually or in unison in Taiwan.

(See GAO note 1, p. 32.)

The report (pp. 7-9) gives a brief description of Taiwan's planning system and the major accomplishments of the agricultural sector. No data to measure agriculture's contribution of the overall economy are presented, nor are the changes in rural people's welfare evaluated. No attempt is made to identify and raise the importance of the unique factors in the Taiwan case, e.g., influence of Japanese occupation, existing infrastructure, literacy, influx of people and capital from the mainland, form of government, lack of political power of the native Taiwanese. We especially think the availability of large scale foreign aid was a significant factor not given adequate attention in the report.

The report states (p. 18) that a "land-to-the-tiller reform program was promulgated in January 1953 and completed during that year." Yet, the report neither reveals the unique circumstances in Taiwan that made it possible for this large scale land reform to be carried out in one year nor questions the likelihood that such an impressive implementation capacity is likely to exist in other LDCs.

We are in full agreement with the report that "a developing country should devise a comprehensive development strategy" for its agricultural/rural sector. Much attention has been given to Taiwan's success in increasing agricultural production by AID, other donors, and developing countries. This report provides some overview of the factors involved but does not add much to existing knowledge about cause-effect relationships in Taiwan's development that can be extrapolated to situations in other countries.

The report recommends to the Secretary of State and the Administrator of AID that the U.S.

"work with other donors to help each developing nation establish a comprehensive strategy for development of its agriculture sector which best suits its needs and which emphasizes incentives to farmers and the effective utilization of resources;

seek a consensus among donors to give greater emphasis to the use of their economic aid for the purpose of helping each developing nation improve its agriculture strategy and build the necessary institutions and infrastructure to carry out these plans."

The U.S., through AID, supports and participates in the systematic appraisal of LDC development policies and programs and in the determination of priority policy actions and investments. This review/analysis process takes place both within the multilateral framework of country-oriented consultative donor groups and within the U.S. bilateral assistance program. AID prepares a Development Assistance Plan for each recipient country, based on assessments of the key sectors and priority problems. This process involves frequent reviews and periodic comprehensive studies of LDC government policies and institutional arrangements. We respectfully request that the report recognize the affirmative actions that the U.S. has undertaken to improve LDC policy-making.

(See GAO note 1, p. 32.)

PRINCIPAL OFFICIALS RESPONSIBLE FOR
ACTIVITIES DISCUSSED IN THIS REPORT

Appointed

DEPARTMENT OF STATE

SECRETARY OF STATE:

Henry A. Kissinger

Sept. 1973

AMBASSADOR TO THE REPUBLIC OF CHINA:

Leonard Unger

Mar. 1974

SPECIAL ASSISTANT TO THE AMBASSADOR
FOR SCIENCE AND TECHNOLOGY AND THE
U.S. MEMBER OF THE JOINT COMMISSION:

Dr. Chester Clark

June 1973

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