Economic Development in Taiwan

Chan Tung Li

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ECONOMIC DEVELOPMENT IN TAIWAN

BY

CHAN-TUNG LI

A thesis submitted in partial fulfillment of the requirements for the degree Master of Science, Department of Economics, South Dakota State College of Agriculture and Mechanic Arts

August, 1963

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Thesis Adviser

Head of the Major Department
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Finally, appreciation is extended to the author's wife, Kuen-sheng Wu, for her help in gathering information and data for this thesis from Taiwan.
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CHAPTER I

INTRODUCTION

Since the end of World War II and following the completion of postwar rehabilitation and readjustment, the world economy has entered upon a new era of development and prosperity. All the advanced countries, whether they came out of the war victorious or defeated, have been fervently engaged in accelerating their economic growth and have been moving far ahead of the underdeveloped. The famous examples, such as the nations in West Europe and Japan in Asia, not only recovered rapidly from the devastation of the war but also achieved high levels of production and a living standard that far surpassed those of prewar years. On the other hand, there has been a general awakening among the underdeveloped nations, especially those new independent ones which were liberated from the colonialism of the western countries after World War II, to a need of economic development.

Virtually every nation in the world, regardless the Eastern or Western, Communist or Capitalist, has made every effort for economic development. All nations, advanced as well as underdeveloped, are driving feverishly toward higher levels of development, with the underdeveloped chasing after the advanced and the advanced seeking for still further development. The whole world seems to have turned into an economic arena where nations are competing with each other and where national strength, international status, and living standard of the people can be best assessed and determined.
There is a small but prosperous island with a standard of living level that is ranked third in the Far East. It is named Taiwan (Formosa) and undoubtedly has also participated in the race of economic development. Various efforts have been made to accelerate the rate of economic growth in Taiwan since 1950. Two 4-year economic development plans have been implemented and completed since 1953. And the third 4-year economic development plan is being carried out since 1961. Achievements have been made through these economic development plans.

Recently General Lucius D. Clay's committee re-examined foreign aid policies for President Kennedy and pointed to several nations—Greece, Israel, Nationalist China (in Taiwan Province), and the Philippines—which have progressed to the point where they can soon stand on their own, needing little more than conventional loans from the Export-Import Bank. But some people in Taiwan still are of the opinion that the rate of growth is not great enough to lift the Island's economy to the subsistence level of a self-propelled and self-sustained economy in the near future. It is a moot question whether the economic development in Taiwan has attained the point mentioned by General Clay or is just as some Taiwanese people think it is. It is worthy of study to find out at what stage of economic development Taiwan stands now.

---

Objectives

The primary purposes of this study are as follows:

1. To realize the economic background and environment of Taiwan in order to understand the further economic development in Taiwan.

2. To evaluate the economic development in the planning period.

3. To examine the economic pattern change from agriculture to industry.

4. To identify the factors that affect economic growth with emphasis on agricultural credit.

5. To ascertain at what stage of economic development it stands.

6. To make suggestions relating to formation of future economic policies.

In short, the over-all objective of this study is an attempt to evaluate the past performance of economic development, to show a true picture of the present situation, and to contemplate making way for further economic development.

Scope of Study and Sources of Data

This study is a macroanalysis of economic development in Taiwan. A large proportion of this thesis deals with the problems of the Four-Year Economic Development Plans since 1953. A historical review of economic development in Taiwan will also be made so that appropriate comparisons can be made between various growth periods.

It is a statement of an old and recognized truth to say that the farming industry is the very basis of the life and prosperity of the
nation, and this statement is more particularly true of Taiwan because of its agricultural development which, although great, can be made vastly greater if the farmers are provided with the long-time credits at low rates of interest which are so essential to the further development of agricultural industry. There is no inducement to greater agricultural development unless it can be made profitable, and it cannot be made profitable unless the necessary capital is available always to farmers upon reasonable terms.

The author has served at the Land Bank of Taiwan for some years. Because of his actual working experience, as told in Chapters VI, VII, and VIII, a special discussion on the problems of agricultural credit is included.

The major source of information is data at the aggregate level. In recent years some systematic statistical series have been developed by the Taiwan's Accounting and Statistical Bureau. A few scholarly studies on economic growth in Taiwan are available but most of them are fragmentary and not many of them have published data on economic development in Taiwan. Other data were obtained from the official documents. And still others were published in the Central Daily News of Taipei, Taiwan.
CHAPTER II

GENERAL INFORMATION CONCERNING TAIWAN

Geographic Description

Off the eastern coast of Asia lie the mountainous island arcs of the Western Pacific. The island chain closest to the continent marks the edge of the Asiatic continental shelf. Taiwan is one of the islands in the chain and is the largest between Japan and the Philippines.

Lying between 21°53’48” and 25°18’5” north latitude and 121°58’10” and 120°38’13” east longitude, the Island lies athwart the Tropic of Cancer. North to south the Island resembles a tobacco leaf. It is about 394 kilometers (244 miles) long and 144 kilometers (89 miles) wide at the broadest place.

In area, it totals 35,961 square kilometers (13,886 square miles), larger than the Netherlands and about equal to Puerto Rico, Jamaica, and Hawaii combined. The smallest province of China, it is separated from Fukien Province on the Chinese mainland by the Taiwan Straits about 200 kilometers (124 miles) at the broadest point and 130 kilometers (90 miles) at the narrowest. The Island is almost the same distance from Shanghai as from Hongkong.

Besides the Island of Taiwan, with its 13 small islands, there are 64 islands in the Penghu group. The Penghu Islands are also known as the Pescadores.

The Central Range, running from north to south, divides the Island into rocky, rugged regions in the east and wide, fertile plains
in the west. The Eastern Coastal or Taitun Range stretches from Hualien to Taitung, parallel to the Central Range.

The principal rivers are the Choshui, the Lower Tamsui, the Tamsui, the Tachia, and the Tsengwen. All of Taiwan's rivers originate in the mountains in the Central Range. Their swift running currents, though providing a good source of hydroelectric power and irrigation, are unsuitable for navigation.

The province is divided into five municipalities, 16 counties, and the Yangmingshan Administration.

Favored by a moderate climate plus an abundance of rainfall, the Island is rich in agricultural produce. It is full of natural scenic spots and has long been known as Island Beautiful.

**Climate**

Straddling the Tropic of Cancer, Taiwan lies in the subtropical belt. Subtropical climate prevails over the greater part of the Island, and the southern part is tropical. Snow is seen only on the high mountain cliffs. Frost on the plains is a rare sight even in midwinter. The summer is long in Taiwan, lasting from May to September. The winter is short and mild and lasts from December to February. Regulated by seasonal wind and ocean breezes, the temperature varies little between seasons. The highest temperature is 33°C. (100.6°F.) and the lowest 1°C. (33.8°F.). The mean temperature is 21.6°C. (70.9°F.) at Taipei in the north and 24.3°C. (75.8°F.) at Kaohsing in the south.

The average annual rainfall is 2,500 millimeters (98.5 inches). Due to the northeastern seasonal winds, the north is blanketed with
TAIWAN (Formosa)

ISLAND PROVINCE of the REPUBLIC OF CHINA
comprising
14 islands in the Taiwan group
64 islands in the Penghu group
AREA: 9,884 SQUARE MILES
POPULATION: 10,000,000


Figure I. Map of Taiwan
heavy rainfall from October to March. The rainy season in the south is between May and September, mostly in sudden showers, short but violent. Hsinchu, Taichung, the coastal areas of the Tainan County, and the Penghu group have the least rainfall.

Typhoons and earthquakes are the main disasters to Taiwan.

Brief History

For a long time this island was inhabited only by native aborigines. Before the coming of Chinese settlers, the aborigines were mostly scattered along the coastal plains. They practiced hunting, fishing, and some farming.

Chinese settlement in Taiwan dates back to the twelfth century, but not until the seventeenth century did large groups of Chinese begin to cross the Taiwan Straits. They possessed a much higher agricultural technology than the aborigines and superimposed a rice culture.

The Penghu Islands (the Pescadores) were settled earlier. Near the close of the thirteenth century, there were 1,600 Chinese settlers on the islands, and scores of ships from the mainland visited them regularly. In 1367 a governor was sent to administer the Penghu Islands as a part of Fukien Province. The islands have since remained an integral part of China.

By 1624 when the Dutch invaded the Island, the Chinese settlers were estimated at around 30,000. The Island had become an exporter of deer skin, deer meat, sugar, and rice. The Dutch established a trading station, built fortresses and churches, welcomed Chinese labor, and imposed heavy taxes both on the inhabitants and the exported items.
In 1661, Cheng Cheng-kung, known to the West as Koxinga, captured Taiwan from the Dutch and chose Anping as his capital. The Island became for Cheng not only a place of refuge but also a defense of the Ming culture. Under Cheng's regime, mainland refugees, including poor farmers, flocked to the Island so that Taiwan had a Chinese majority in population and culture. The Manchus conquered the Island in 1683 and the following year the Island was made a prefecture of Fukien Province. For the next 200 years the Island was a home for emigrants from the provinces of Fukien and Kwangtung.

Taiwan was made a province of China in 1886. At the conclusion of the first Sino-Japanese War in 1895, Taiwan and Penghu were ceded to Japan. On August 15, 1945, when Japan accepted the terms of unconditional surrender, she agreed to return Taiwan and Penghu to China in conformity with the Cairo declaration. Formal retrocession was effected on October 25, 1945. Taiwan has since been administered as one of the Republic of China. Since 1949 when the Chinese Communists conquered the mainland of China, the Government of the Republic of China was relocated in Taiwan.

Population

The total population in Taiwan at the end of 1960 was 10,792,000, excluding members of the armed forces and aliens (see Table 1). The population of Taiwan has increased rapidly in recent years. In 1905, the date of the first census, there were 3,000,000 people on the Island, largely the descendants of migrants from the coastal provinces of southern Fukien and eastern Kwangtung. By 1920 the population had
risen to 3,700,000. The 1940 census indicated a population of 5,870,000, including some aborigines. The population had nearly doubled in 35 years. On September 16, 1956, a new census was taken and showed there were about 9,310,158 inhabitants, not including the military.

Table 1. Population of Taiwan (End of 1905-1960)

<table>
<thead>
<tr>
<th>End of year</th>
<th>Population</th>
<th>Natural increase rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1905</td>
<td>3,039,715</td>
<td>9.38</td>
</tr>
<tr>
<td>1920</td>
<td>3,655,308</td>
<td>25.51</td>
</tr>
<tr>
<td>1940</td>
<td>5,872,084</td>
<td>31.50</td>
</tr>
<tr>
<td>1950</td>
<td>7,554,399</td>
<td>37.62</td>
</tr>
<tr>
<td>1951</td>
<td>7,869,247</td>
<td>37.62</td>
</tr>
<tr>
<td>1952</td>
<td>8,128,374</td>
<td>36.15</td>
</tr>
<tr>
<td>1953</td>
<td>8,438,016</td>
<td>35.13</td>
</tr>
<tr>
<td>1954</td>
<td>8,749,151</td>
<td>35.79</td>
</tr>
<tr>
<td>1955</td>
<td>9,077,643</td>
<td>36.03</td>
</tr>
<tr>
<td>1956</td>
<td>9,390,381</td>
<td>36.21</td>
</tr>
<tr>
<td>1957</td>
<td>9,690,250</td>
<td>33.11</td>
</tr>
<tr>
<td>1958</td>
<td>10,039,435</td>
<td>34.07</td>
</tr>
<tr>
<td>1959</td>
<td>10,431,341</td>
<td>33.95</td>
</tr>
<tr>
<td>1960</td>
<td>10,792,202</td>
<td>32.58</td>
</tr>
</tbody>
</table>

Source: China Yearbook, 1961-1962

The population has been growing at an annual rate of 3.5 per cent over the past decade. There is some evidence that this high rate of growth is slowing and may drop during the next four years to an annual rate of about 3.15 per cent. This would mean a population of about 12,200,000 by 1964.

The proportion of the civilian population which is economically active is relatively low. In 1960 there were 3,344,000 persons 12 years of age or over who were employed. This represents 31 per cent of the
civillian population. On the basis of figures published by the United Nations, this figure may be compared with 49.3 per cent for Japan, 46.2 per cent for the United Kingdom, 40.7 per cent for the United States, and 39.4 per cent for the Philippines.

Furthermore, the portion of the population which is economically active has been declining. The percentage was 35.5 per cent in 1952. It dropped steadily throughout the decade until it reached 31 per cent in 1960. The forecast for 1964 reflects a continuation of this decline (see Table 2).

Table 2. Civilian Population and Employment of Taiwan 1952-1960 and 1964

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Employment</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1952</td>
<td>8,128</td>
<td>2,884</td>
<td>35.5</td>
</tr>
<tr>
<td>1953</td>
<td>8,438</td>
<td>2,895</td>
<td>34.3</td>
</tr>
<tr>
<td>1954</td>
<td>8,749</td>
<td>2,999</td>
<td>34.3</td>
</tr>
<tr>
<td>1955</td>
<td>9,078</td>
<td>3,026</td>
<td>33.3</td>
</tr>
<tr>
<td>1956</td>
<td>9,390</td>
<td>3,015</td>
<td>32.1</td>
</tr>
<tr>
<td>1957</td>
<td>9,690</td>
<td>3,110</td>
<td>32.1</td>
</tr>
<tr>
<td>1958</td>
<td>10,039</td>
<td>3,178</td>
<td>31.7</td>
</tr>
<tr>
<td>1959</td>
<td>10,431</td>
<td>3,272</td>
<td>31.4</td>
</tr>
<tr>
<td>1960</td>
<td>10,792</td>
<td>3,344</td>
<td>31.0</td>
</tr>
<tr>
<td>1964 est.</td>
<td>12,200</td>
<td>3,714</td>
<td>30.4</td>
</tr>
</tbody>
</table>

Note: Population excludes members of the armed forces and foreign nationals. Employment includes all those economically active, 12 years of age or over. Forecast for 1964 is from the "Third Four-Year Economic Development Plan."


\[1\text{UN, Statistical Yearbook, 1961.} \]
The general pattern of employment reflects the predominance of agriculture. In 1960, 56.1 per cent of those employed were engaged in farming and related activities. This, however, is lower than it was at the beginning of the decade. The following comparison is pertinent.

<table>
<thead>
<tr>
<th>Economic Sectors</th>
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</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>62.1%</td>
<td>56.1%</td>
</tr>
<tr>
<td>Industry</td>
<td>9.4</td>
<td>11.3</td>
</tr>
<tr>
<td>Commerce</td>
<td>8.3</td>
<td>8.9</td>
</tr>
<tr>
<td>Services</td>
<td>7.3</td>
<td>9.3</td>
</tr>
<tr>
<td>Other</td>
<td>11.9</td>
<td>14.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

The increase in the percentage of the total employment engaged in industry is particularly noteworthy. This increase is expected to continue—the projected figure for 1964 is 13.3 per cent. 2

The labor force of Taiwan is intelligent and can be readily trained. Furthermore, the present generation of children is receiving a more complete education than their parents enjoyed. Of the children of grade school age in Taiwan, 95.59 per cent are enrolled in primary schools. Of the primary school graduates of 1959-60, 51 per cent enrolled in junior high school. Of the junior high school graduates of 1959-60, 80 per cent continued into high school. Of the high school graduates of the same year, 76 per cent enrolled in some kind of higher

education. At the higher levels, the inadequacy of physical facilities is often a limiting factor.

Manpower is Taiwan's most valuable resource and means should be found to increase its utilization.

Type of Government and the Economic Philosophy

It had been the hope of Dr. Sun Yet-sen to establish a republic based on his Three Principles of the People; namely, (1) nationalism, to achieve political unity so as to resist imperialism; (2) democracy, to establish a centralized government on a popular base; and (3) people's livelihood, to elevate the living standard and the welfare of the people. The Three Principles of the People mean government "of the people, by the people, and for the people."

The form of government incorporated in the Constitution of the Republic of China follows the five-power system envisaged by Dr. Sun, which has the major features of both cabinet and presidential forms of government. The concepts of this five-power constitution are evident in the National Assembly and its functions; the position of the President as over and above the five Yuan--executive, legislative, judicial, control, and examination; the independence of the powers of examination and control; the order of precedence of the five Yuan; and the division of power between national and local governments, including the division of the latter into provincial and county levels, and provisions for direct election and recall of heads of national and local governments. The government has closely observed Dr. Sun's political ideal as to organize and function.
The "Principle of Livelihood" is the economic philosophy in Taiwan. The core of the principle is social well-being. There are four main practices advocated by Dr. Sun; namely, (1) social and industrial reform; (2) public ownership of public utility; (3) direct taxation; and (4) socialized distribution. In addition to these practices, there are two methods for carrying out the principle. The first method is equalization of landownership and the second is regulation of capital. The famous "Land-to-the-Tiller" program implemented in Taiwan is based on the method of equalization of landownership. The method of regulation of capital was designed for avoiding overexpansion of capitalists in the future, which may monopolize the national economy and harm social well-being. The feature of the principle of livelihood is, in some degree, the similarity of that of modified capitalism prevailing in some western countries in modern times. Its ultimate goal is to attain the Confucius' hope of a "great commonwealth."
CHAPTER III

ECONOMIC BACKGROUND

Natural Environment

The province of Taiwan is composed of 79 isles of little economic value except the main Island of Taiwan. The natural resources of Taiwan are neither numerous nor extensive. However, the resources which are available have, in most cases, been well developed and extensively utilized. The natural resources which are related to economic development are summarized as follows.

1. Agricultural land is the most important natural resource of Taiwan. It supports a highly productive and diversified agriculture which produces an abundance of food for the population as well as a substantial export volume. Cultivable land totals about 900,000 hectares (1 hectare = 2.471 acres), of which 880,000 hectares are already utilized. Fertility of the soil is not high and is diminishing as a result of intensive land use. Because of this, the growth of crops depends greatly on heavy application of chemical fertilizers. Rainfall is abundant but its distribution over the months is not even. This uneven distribution, together with the high mountains and steep valleys, has made both irrigation and flood control a necessity. Therefore, chemical fertilizer and irrigation are of utmost importance to the agriculture in Taiwan.
2. Taiwan has an ample water supply, although its distribution, both seasonally and geographically, is somewhat out of balance with requirements. Substantial development programs for both surface water and ground water are under way. These will provide supplemental irrigation where needed, control floods, and add to the capacity of the power generating system.

3. The forest resources of Taiwan are considerable, although costly to develop. Conifers, which are commercially the most attractive, are at high altitudes, in rough terrain, and expensive to log. Bamboo is abundant and very important commercially. The timber cut is gradually increasing each year, but this resource does not seem to offer significant industrial development possibilities at this time.

4. The Island has a coast line of 1,600 kilometers (1,000 miles). The fishery resources available to Taiwan are great. Deep sea, inshore, and pond fisheries are all being developed. Although most of the fish production is used on Taiwan for food, an increasing tonnage of tuna is exported.

5. Although the coal resources of Taiwan are characterized by narrow seams and high-cost mining, they are extremely important to the economy. They provide the fuel for thermal generation of power, which firms up the hydroelectric power. They also can provide the coking quality coal which will be necessary to the development of a basic steel industry.
6. Natural gas is the newest resource to be developed in Taiwan. It appears to give an excellent potential since it can provide the basis for significant industrial development.

7. Taiwan is not well endowed with industrial minerals. However, it does have some good deposits of nonmetals, including limestone, dolomite, and silica sand. All of these are well developed and extensively used.

8. Solar evaporated salt is produced in the southern part of the Island; its production is also small.

Economic Development Before 1945

The Japanese began to develop the Island soon after it was ceded to Japan in 1895. As a first step in economic development, they directed their efforts to the construction of forest resources and establishment of a banking system. These were followed by large-scale construction of irrigation facilities and installation of power plants as a basis for agricultural and industrial development. Then came the development of major agricultural products and industries connected with the processing of such products. The development of heavy industries and other light industries came last.

At the time of its restoration to China (1945), Taiwan had already attained a stage of development with the following characteristics:

1. A well-developed system of land and ocean transportation and an abundant supply of electric power were in existence.

These constituted the very foundation for Taiwan's economic
2. Agriculture was already highly developed. Virtually all agricultural resources having economic value were being developed and utilized. The two major agricultural products were sugar and rice which even today constitute the main pillars of Taiwan's economy.

3. Due to the lack of industrial resources, industrial development was comparatively slow. During its early stage, most of the industries were of agricultural processing industries developed to meet Japan's needs. The most important among them was sugar manufacturing. Others included canned fruits, vegetable oil, and tea processing. Later, as more electric power became available and as Japan's preparations for war were stepped up, chemical industries (such as basic chemicals and fertilizers) and heavy industries (such as petroleum refining, aluminum, steel, machinery, and shipbuilding) gradually came into being. Shortly before the end of World War II, textile and paper industries were also developed with a view to achieve economic self-sufficiency.

4. In the area of trade, agricultural and processed agricultural products, especially rice and sugar, were the most important exports. Manufactured goods made up most of the imports. The most important trade partner was Japan, accounting for over 80 per cent of total trade volume.
5. Persons responsible for the economic development of Taiwan were all Japanese. The ownership and management of virtually all the modern and comparatively large enterprises were in the hands of the Japanese. Capital and technical and managerial skills were all supplied from Japan. It was for this reason that immediately after the war Taiwan's economic development, especially industrial development, ran into great difficulties as a result of the repatriation of the Japanese.

Taiwan's economy suffered very heavy losses during World War II. Although the damage done to agriculture was comparatively less serious, most agricultural improvement projects were suspended and irrigation facilities left unattended. Moreover, because of the cutting off of fertilizer imports, farm production decreased sharply. In the industrial sector, virtually all modern industrial establishments of importance were destroyed by Allied bombing. And what was spared was in a state of deterioration owing to excessive wear and tear and inadequate maintenance.

During early postwar years, the rehabilitation work progressed rather slowly. The Central Government was then preoccupied with the suppression of Communists on the China mainland, while the Island itself, first exploited by the Japanese, then devastated by war and engulfed in serious inflation, was unable to undertake any substantial reconstruction work. Compared with rehabilitation in the agricultural sector which was less demanding of capital and know-how, that in the
industrial sector was, of course, much more costly. In the year of 1943 the level of industrial output came up to only 59 per cent of that of 1941. And it was not until 1949 when manpower and supplies were evacuated from the China mainland that large-scale economic reconstruction began to move forward under the concerted efforts of the Central and Provincial Governments with economic aid from the United States.

Table 3 below shows the output of principal agricultural and industrial products at different periods. From it we can have a rough picture of what the Japanese had achieved in Taiwan, of the extent of war damages, and of the work of rehabilitation as of the end of 1949.

Table 3. Output of Principal Agricultural and Industrial Products at Different Periods

<table>
<thead>
<tr>
<th>Product</th>
<th>Unit</th>
<th>Peak during Japanese rule</th>
<th>1945 output</th>
<th>1949 output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>1,000 mt</td>
<td>1,400</td>
<td>640</td>
<td>1,200</td>
</tr>
<tr>
<td>Pineapple</td>
<td>1,000 mt</td>
<td>146</td>
<td>18</td>
<td>43</td>
</tr>
<tr>
<td>Fish</td>
<td>1,000 mt</td>
<td>120</td>
<td>17</td>
<td>80</td>
</tr>
<tr>
<td>Coal</td>
<td>1,000 mt</td>
<td>2,850</td>
<td>790</td>
<td>1,600</td>
</tr>
<tr>
<td>Sugar</td>
<td>1,000 mt</td>
<td>1,420</td>
<td>330</td>
<td>650</td>
</tr>
<tr>
<td>Cement</td>
<td>1,000 mt</td>
<td>300</td>
<td>100</td>
<td>290</td>
</tr>
<tr>
<td>Paper</td>
<td>1,000 mt</td>
<td>26</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Electric power</td>
<td>million kwh</td>
<td>1,195</td>
<td>357</td>
<td>854</td>
</tr>
</tbody>
</table>

Resource: Provided by the Research Center, CFUSA, Taipei, Taiwan.
CHAPTER IV

ECONOMIC DEVELOPMENT SINCE 1950

The Four-Year Economic Development Plans

A series of Four-Year Economic Development Plans was started in January, 1953. There have been two Four-Year Economic Development Plans implemented and completed in Taiwan since that year. The first one was begun in 1953 and was completed four years later. The second succeeded the first one in January, 1957, and was completed in December, 1960. The third one succeeds the second one and is being carried out now.

Formal development programs have become the common practice for guiding national economic growth in the developing countries. Because of differences in resource endowment, geographical location, and qualifications, the purposes and methods of economic planning vary.

Taiwan, in a strict sense, is not an independent region. She must affiliate with neighboring countries because of a lack of natural resources. Her economy was a part of the China mainland before the Japanese took over. Japan converted the Island into a supplier of raw materials, such as rice, sugar, and other agricultural products. Taiwan resumed her economic affiliation with China after World War II, and this close relationship was cut off when the Chinese Communists overrode the mainland in 1948. On the other hand, the population of Taiwan increases at an amazing rate and partly because of this fact economic planning has captured general public attention.
The goals of economic planning in Taiwan may be summarized as follows: (1) to increase both agricultural and nonagricultural production for domestic consumption and export, (2) to develop basic industries such as generation of electric power and to facilitate production of chemical fertilizers and the manufacturing of consumer goods, (3) to achieve the balance of external trades, (4) to improve living conditions, and (5) to establish a self-propelled and self-sustaining economic entity.

1. The First Four-Year Economic Development Plan was launched in January, 1953, and completed in December, 1956. The over-all goal of this plan was to raise agricultural and industrial production and to improve the balance of payments position. During the plan period, most of the major projects under the plan were completed. The planned total investment was NT$7,800,000,000 (roughly equal to U.S. $200 million) while actual investment was NT$6,800,000,000 or 87 per cent of the goal. Of this figure 28 per cent or NT$1,922,000,000 went to agriculture, which was NT$483,000,000 less than the projected amount. Investment in industries, including manufacturing, mining, power, transport, and communications, accounted for 72 per cent, or NT$4,871,000,000, which was NT$569,000,000 less than originally planned.

2. The Second Four-Year Economic Development Plan covered the period of 1957 to the end of 1960 with more emphasis on expansion of foreign trade, balancing of international
payments, and creation of job opportunities. Total investment under the second plan was set at NT$20,000,000,000 (roughly equal to U.S. $500 million). The actual figure, however, reaches NT$22,100,000,000 in terms of 1956 prices, which was 10.4 per cent higher than the target. Compared with the first plan, the second was more successful. This was mainly due to such factors as reform in foreign exchange and trade control, removal of restrictions on the establishment of new factories, improved distribution of raw materials, and relaxation of entry and exit regulations governing investment by foreign nationals and overseas Chinese.

3. The Third Four-Year Economic Development Plan, designed to succeed the second one, extends from 1961 to 1964. A total investment of NT$50,019,000,000 (roughly equal to U.S. $1.25 billion) will be required for the four-year period from 1961 to the end of 1964. Of this amount, more than half are designated for industrial development. First priority will be given to expansion of industries using local raw materials—chiefly sugar, canned pineapple, and other farm produce—processing industries, cement, glass, pulp and paper, plastics, petrochemicals, fertilizer, and caustic soda. Next in importance will be plywood, textile, and pharmaceutical industries using imported raw materials. To support industrial expansion, production of electric power and coal will be increased, and oil exploration, which has shown good
prospects, will be intensified.

Efforts under the plan will also be made in agriculture. It is directed primarily to the development of water resources, agricultural resources in the plains, marginal land potentials, and forest and fishery resources. The carrying out of these efforts will be guided by several very important needs, i.e., the needs for diversification of agricultural exports in coordination with the development of exports and the need for an expanded agricultural base to support industrial development by supplying raw materials.

Because this plan is still incomplete, the result will not be known until the close of 1964.

In the economic development of Taiwan during the past decade, the First and Second Four-Year Plans had played a very important role. In order to understand the achievements of these plans, the important economic sectors will be discussed in the following sections.

**Agriculture**

The Island of Taiwan comprises about 35,834 square kilometers, or about 3,600,000 hectares. Of this total, 877,800 hectares or about 25 per cent is arable. All of the latter area is not only being utilized but also its productivity is being enhanced under programs involving the increased application of fertilizers, supplemental irrigation, and multicrop methods. In addition, there are about 300,000 hectares of marginal land suitable for grazing grasses or fruit trees which is marked for future development. There is also a possibility of reclaiming some tidal lands along the west coast. The rest of the
Island is too rugged for agriculture.

Agricultural land is Taiwan's most important natural resource. Not only does it provide the food supply for the population but it also provides three of the five top exports of the Island: sugar, pine-apples, and tea.

Although the variety of crops which can be grown in Taiwan is quite large, actual plantings are highly concentrated. Nearly 80 per cent of the major crop hectares planted in recent years were in four crops--rice, sweet potatoes, peanuts, and sugar cane. However, it should be noted that a gradual diversification has been taking place.

While fully cognizant of the important role of industrialization in underdeveloped areas, Taiwan has never neglected its agricultural development. So far, the production pattern of the Taiwan economy is still mainly agricultural, with about 56 per cent of its employed population engaged in agriculture. Income from agriculture accounts for one-third of the national income. In other words, any advancement in agricultural production will bring higher income and better livelihood to more than one-half of the total population and will become a powerful support to economic development. Hence, in launching the economic development programs in Taiwan, equal emphasis has been placed on agricultural and industrial development. In agricultural programs, stress was simultaneously laid on land reform, production facilities, rural living conditions, and agricultural credit. (Agricultural credit will be separately discussed in Chapters VI, VII, and VIII.)
1. Land Reform. The major objective of land reform in Taiwan is to let the tillers have their own land, i.e., to allocate land to the farmers who actually till the land. This reform was started in 1949 and completed in 1953. In the first phase of the reform, land rental was lowered from 50 to 70 per cent of the annual yield of the land to 37.5 per cent. The number of tenant farmers benefited from the reduction in farm rents reached 300,000 families or 50 per cent of the total farming population at that time.

In the second phase of the land reform, the public farm lands were sold to the tillers. The government of the Republic of China had in Taiwan 100,000 hectares which were tilled by tenant farmers under lease. To abolish farm tenancy on publicly owned lands, and to set an example to the people in the forthcoming implementation of the land-to-tiller policy on private tenanted land, the government promulgated in 1951 the regulations governing the sale of public farm lands to establish owner farmers in Taiwan Province. In the same year the government started to sell the public lands to incumbent tenant farmers. The sale price is fixed at 2.5 times the annual main crop yield, to be amortized by the tenant purchaser in 20 installments spread over 10 years. During the 11-year period from 1951 to 1962, six successive sales were made by the government and a total of 94,361 hectares of public lands were sold to 208,672 tenant families.
In the third phase of the reform of land, the "Land-to-the-Tiller" program was implemented by requiring landlords to sell their land to tenant farmers and farm hands who actually tilled the land and by selling public land to farmers who had no land of their own. The cost of the land to be paid by the new landowners to the government was effected in 20 installments spread over 10 years, the annual amount of which plus land tax and irrigation charges roughly equals 37.5 per cent of the yield, i.e., the amount of rental paid before the purchase of the land. On the other hand, 70 per cent of the cost of land was paid by the government to the landlords in the form of land bonds, redeemable in 20 installments within 10 years and 30 per cent in shares of public enterprises. As a result a total of 139,200 hectares or 55 per cent of the total private tenanted lands have been compulsorily purchased by the government and resold to 194,823 farm families or 64 per cent of the total tenant population on private lands. Politically speaking, Taiwan has undergone a bloodless social revolution, whereby farm production efficiency and the rural standard of living were substantially raised.

2. Production Facilities. The improvement of rural production facilities undertaken in Taiwan covers rational land utilization, maintenance and expansion of irrigation systems, pest control, selection and extension of better seed strains,
adoption of modern farming techniques and implements, and the establishment and improvement of sales and shipping systems for farm products. In the past decade over 500 new species of seeds have been introduced from abroad for testing; those which are found suitable to the Taiwan climate and soil are immediately extended. As to irrigation systems and flood control, a rotational irrigation system has been adopted to supply water to arid areas. In addition to the rehabilitation of existing flood control projects, many new ones have been completed. Pest control has been intensified with the introduction of new pesticides and rat control has also been successfully carried out. The cases here cited are just a few of the many development projects undertaken.

In animal husbandry, work has been concentrated on the introduction of better breeds, disease control, and exploration of grazing land for the development of a modern animal industry.

An aerial survey of forestry resources has been completed for further forestry development, in addition to the opening of new lumber yards, reforestation, and introduction and supply of new species from abroad.

3. Improvement of Rural Living Conditions. Improvements made in the life of rural people include better medical care and public health service, adult education for the farmers, 4-H Club activities for the rural youth, home economics training,
rural electrification, and provision of radio and other media of information. Although these improvements seemed to have no direct impact on the economy, actually they proved essential in the raising of farmers' productivity, the maintenance of social order in rural communities, the spreading of modern knowledge, and the shift away from conservatism in rural life. Each of these conditions is generally considered a prerequisite to the modernization of an economy.

Production of many crops has shown a substantial increase (see Table 4). It should be noted that a number of crops have shown an increase of well over 100 per cent in the two Four-Year Economic Development Plan periods.

Table 4. Agricultural Production of Selected Crops 1952, 1956, and 1960

<table>
<thead>
<tr>
<th>Crop</th>
<th>1952</th>
<th>1956</th>
<th>1960</th>
<th>Increase 1952-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>6,981</td>
<td>10,583</td>
<td>20,717</td>
<td>196%</td>
</tr>
<tr>
<td>Tea</td>
<td>11,582</td>
<td>13,420</td>
<td>17,365</td>
<td>49%</td>
</tr>
<tr>
<td>Tobacco</td>
<td>8,372</td>
<td>15,216</td>
<td>15,937</td>
<td>77%</td>
</tr>
<tr>
<td>Peanuts</td>
<td>60,037</td>
<td>31,847</td>
<td>102,187</td>
<td>70%</td>
</tr>
<tr>
<td>Cotton</td>
<td>989</td>
<td>1,135</td>
<td>2,143</td>
<td>116%</td>
</tr>
<tr>
<td>Pineapples</td>
<td>62,760</td>
<td>83,065</td>
<td>166,730</td>
<td>165%</td>
</tr>
<tr>
<td>Soybeans</td>
<td>14,627</td>
<td>26,442</td>
<td>52,653</td>
<td>259%</td>
</tr>
<tr>
<td>Rice (brown)</td>
<td>1,570,115</td>
<td>1,789,829</td>
<td>1,912,018</td>
<td>21%</td>
</tr>
<tr>
<td>Sweet potatoes</td>
<td>2,090,463</td>
<td>2,568,104</td>
<td>2,978,676</td>
<td>42%</td>
</tr>
<tr>
<td>Wheat</td>
<td>16,604</td>
<td>27,099</td>
<td>45,574</td>
<td>174%</td>
</tr>
<tr>
<td>Sugar cane</td>
<td>4,880,883</td>
<td>6,343,247</td>
<td>6,736,770</td>
<td>38%</td>
</tr>
</tbody>
</table>

Rice is, of course, the major food crop raised in Taiwan. The yield of rice per planted hectare has shown steady improvement. In 1952 the average yield was 1,998 kilograms of brown rice per planted hectare. By 1960 it reached 2,495 kilograms. It is expected that the production of rice will continue to increase in the years ahead.

With population growth rates running in excess of 3 per cent per annum, there will be a continuous pressure to use the scarce land resources of Taiwan to feed the population. However, it is likely that some high-value crops requiring relatively small amounts of land can be grown and processed for export without interfering with food production. The development of the canned mushroom industry, which grew from 12,200 cases in the year 1960 to 174,300 cases in 1961, is an outstanding example of what can be done. Other expansion possibilities may exist in the development of the marginal land as a base for a livestock industry. However, the basic land utilization pattern is not likely to change significantly.

Industry

What little industrial base had been developed by the Japanese was entirely wiped out during World War II. Postwar industrial development in Taiwan began with the rehabilitation of war-devastated industries, including electric power, cement, paper, sugar, fertilizer, basic chemicals, petroleum, and aluminum. At the time of rehabilitation, the government also extended assistance to those industries evacuated from the China mainland for re-establishment on Taiwan. After such rehabilitation and reconstruction work was fairly completed in 1950, the
government began to plan for further development. With limited human and material resources at its disposal, the government could afford to develop only those industries with highest priority. These were: (1) electric power, because it was a prerequisite to the development of all other industries; (2) fertilizer, because it was essential to the production of food; and (3) textiles, because at that time textiles constituted the largest item of imports.

In addition to the above three key industries of highest priority, a number of others were also expanded or newly established. Especially during the years from 1953 through 1956 the whole industrial sector witnessed a prosperous upsurge following the improvement in general economic environment. Indeed, it was during this period that many of the new factories, large and small, have been established in the past decade and most of them are privately owned. As a result of this industrial growth, Taiwan is now capable of producing all the necessities of life as well as some durable consumer goods and capital goods. It also has industrial products for export.

Because of its taking over of all Japanese-owned establishments at the end of World War II, the government has owned and operated quite a number of industries in Taiwan. However, the government's basic policy has persistently been one of stimulating the growth of private enterprise. Besides the transfer in 1954 of four big government-owned enterprises into private ownership in connection with the implementation of the land-to-tiller program, almost all new industries were open to private interests. This can be best shown by the changing relative
position of government and private enterprises. In the year of 1949, government enterprises accounted for 72.4 per cent of total industrial production. In 1960 their share fell to 40.7 per cent. In the area of employment, government enterprises employed 35.7 per cent of the total industrial workers in 1952. In 1960 they employed only 25.3 per cent. Finally, government enterprises are no longer the only ones with large plants and modern equipment. The number of large-scale private enterprises with modern equipment has been growing steadily in recent years. Government contribution toward industrial growth in Taiwan has been great. The government has not only formulated policies favorable to industrial development but has also instituted a number of incentive measures that directly stimulate growth. Its efforts in the promotion of industrial development may be briefly described under four headings.

1. Formulation of policies and plans for over-all industrial development.

2. Initiation and promotion of new undertakings. In an advanced economy, new undertakings are ordinarily sponsored by private investors. In an underdeveloped economy, however, the government has to do most of the job. This is also true with Taiwan. The government, besides serving as promoter for public enterprises, has been the sponsor or supporter of almost all the large private enterprises established in recent years. The plate glass plant, the viscose rayon plant, and the polyvinyl resin plant are the best-known
examples. Such government participation and assistance has inspired confidence of the private investor, enhanced the likelihood of his success, and at the same time helped the government itself to attain its objective of industrial development.

3. Improvement of investment climate. Important efforts in this direction include: amendment of tax laws, adjustment of monetary policies (extension of various types of industrial loans at low interest rates), simplification of multiple exchange rates, and promulgation of investment statutes for overseas Chinese and foreign nationals.

4. Establishment of institutions relating to industrial development. Over the past few years, a number of institutions relating to industrial development have been established, such as Industrial Planning and Coordination Group under the Ministry of Economic Affairs, China Productivity and Trade Center, China Development Corporation, China Technical Consultants, Inc., Taiwan Handicraft Promotion Center, and Industrial Development and Investment Center. These institutions are most helpful to industrial development in Taiwan.

The industrial segment of the economy has been growing relatively fast. Table 5 shows the production of the principal industrial commodities before and after the implementation of the two 4-year plans during the 1953 to 1957 and 1957 to 1961 periods.
Table 5. Production of Selected Manufactured Products  
1952, 1956, and 1960

<table>
<thead>
<tr>
<th>Product</th>
<th>Unit</th>
<th>1952</th>
<th>1956</th>
<th>Change</th>
<th>1960</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canned pineapple</td>
<td>Cases</td>
<td>490.0</td>
<td>1,132.0</td>
<td>131%</td>
<td>2,219.0</td>
<td>96%</td>
</tr>
<tr>
<td>Refined sugar</td>
<td>MT</td>
<td>624.0</td>
<td>776.0</td>
<td>24</td>
<td>846.0</td>
<td>9</td>
</tr>
<tr>
<td>Edible oils</td>
<td>MT</td>
<td>9.2</td>
<td>14.2</td>
<td>54</td>
<td>18.2</td>
<td>28</td>
</tr>
<tr>
<td>Cotton yarn</td>
<td>MT</td>
<td>13.6</td>
<td>24.4</td>
<td>79</td>
<td>40.4</td>
<td>65</td>
</tr>
<tr>
<td>Synthetic yarn</td>
<td>MT</td>
<td>--</td>
<td>1.1</td>
<td>--</td>
<td>5.8</td>
<td>427</td>
</tr>
<tr>
<td>Cotton fabric</td>
<td>M</td>
<td>87,639.0</td>
<td>142,426.0</td>
<td>62</td>
<td>176,202.0</td>
<td>23</td>
</tr>
<tr>
<td>Plywood</td>
<td>M</td>
<td>1,393.0</td>
<td>3,721.0</td>
<td>167</td>
<td>10,315.0</td>
<td>177</td>
</tr>
<tr>
<td>Bagasse board</td>
<td>Piece</td>
<td>740.0</td>
<td>1,579.0</td>
<td>113</td>
<td>2,540.0</td>
<td>61</td>
</tr>
<tr>
<td>Paper</td>
<td>MT</td>
<td>27.6</td>
<td>49.4</td>
<td>78</td>
<td>97.3</td>
<td>96</td>
</tr>
<tr>
<td>Paperboard</td>
<td>MT</td>
<td>5.8</td>
<td>9.2</td>
<td>58</td>
<td>23.6</td>
<td>156</td>
</tr>
<tr>
<td>Caustic soda</td>
<td>MT</td>
<td>8.9</td>
<td>19.6</td>
<td>120</td>
<td>32.8</td>
<td>67</td>
</tr>
<tr>
<td>Soda ash</td>
<td>MT</td>
<td>0.6</td>
<td>2.5</td>
<td>31.6</td>
<td>11.3</td>
<td>352</td>
</tr>
<tr>
<td>Fertilizer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrogen</td>
<td>MT</td>
<td>13.6</td>
<td>14.9</td>
<td>9</td>
<td>47.2</td>
<td>216</td>
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<tr>
<td>P2O5</td>
<td>MT</td>
<td>13.5</td>
<td>19.9</td>
<td>47</td>
<td>25.5</td>
<td>28</td>
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<tr>
<td>Alcohol</td>
<td>KL</td>
<td>13.3</td>
<td>24.0</td>
<td>80</td>
<td>26.1</td>
<td>8</td>
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<tr>
<td>Polyvinyl</td>
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<td>chloride</td>
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<td>3.4</td>
<td>--</td>
</tr>
<tr>
<td>Polyethylene</td>
<td>MT</td>
<td>--</td>
<td>--</td>
<td>--</td>
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</tr>
<tr>
<td>Gasoline</td>
<td>KL</td>
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<td>163.0</td>
<td>100</td>
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<td>Fuel oil</td>
<td>KL</td>
<td>110.0</td>
<td>328.0</td>
<td>193</td>
<td>412.0</td>
<td>27</td>
</tr>
<tr>
<td>Petrochemicals</td>
<td>MT</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>4.6</td>
<td>--</td>
</tr>
<tr>
<td>Sheet glass</td>
<td>Box</td>
<td>--</td>
<td>161.5</td>
<td>--</td>
<td>468.8</td>
<td>190</td>
</tr>
<tr>
<td>Cement</td>
<td>MT</td>
<td>44.6</td>
<td>591.0</td>
<td>32</td>
<td>1,183.0</td>
<td>100</td>
</tr>
<tr>
<td>Steel products</td>
<td>MT</td>
<td>23.4</td>
<td>107.0</td>
<td>357</td>
<td>243.0</td>
<td>127</td>
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<tr>
<td>Aluminum ingots</td>
<td>MT</td>
<td>3.9</td>
<td>8.8</td>
<td>125</td>
<td>8.3</td>
<td>-6</td>
</tr>
<tr>
<td>Insulated wire and cables</td>
<td>M</td>
<td>8.5</td>
<td>20.9</td>
<td>145</td>
<td>24.5</td>
<td>17</td>
</tr>
<tr>
<td>Motor vehicles</td>
<td>Units</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>649.0</td>
<td>--</td>
</tr>
</tbody>
</table>

*Not in thousands.
Source: Compiled from Taiwan Economic Statistics and primary sources.
Although the basic composition of the manufacturing industry has not changed radically, there have been some new industries which have grown very rapidly. It will be noted that, in addition to sugar and pineapple, substantial quantities of textiles, paper and paperboard, fertilizer, industrial chemicals, petroleum products, glass, and cement were produced in 1960. This suggests the extent of the industrialization which has already taken place.

As in most rapidly developing countries, technical know-how and management talent are scarce. Although steps are being taken through the Productivity and Trade Center and the educational system to meet this problem, it is not easy to solve and will require considerable time. Another problem which may impede industrial development is the shortage of equity capital. Interest rates are generally quite high. An adequate mechanism does not exist to channel accumulated savings into productive manufacturing enterprise, and the public generally is not accustomed to this kind of financial investment.

**Fisheries**

Fisheries are of prime social and economic importance to Taiwan. About 320,000 people are actively engaged in fishing, on the fish farms, and at the processing factories. This is almost as much as 10 per cent of Taiwan's total employment of about 3.3 million.

Fisheries are also of vital importance in providing foodstuff in Taiwan for they are a principal source of animal proteins and the only source which promises a substantial future supply of animal proteins at a relatively low price.
In cognizance of the importance of the fisheries as a source of employment and of animal protein food for a rapidly growing population, the government and the industry have in the past decade both devoted considerable effort to the development of fisheries.

For statistical and administrative purposes, the fisheries are classified into four main categories.

1. Deep-sea fisheries. Under this category are all otter trawlers, pull trawlers, and tuna long liners of over 50 tons.

2. Inshore fisheries. Under this category are all powered boats which do not come under deep-sea fisheries.

3. Coastal fisheries. Coastal fisheries are those which employ fishing craft without power, mainly sampans and bamboo rafts. Fisheries which do not employ any boats, such as beach seines, set nets, and cast nets, are also included in this category.

4. Fish culture. Under this category are the rearing of fish, crabs, and shrimp in ponds, reservoirs, and paddy fields, as well as the culture of oysters and clams in shallow waters.

Development of the fisheries industry in the past decade in Taiwan may be described as follows:

1. Construction of fishing vessels. Construction of powered fishing vessels in Taiwan, with the extension loans from United States aid organizations and banking institutions, has
made impressive progress since 1952. At the end of 1960, the number of powered fishing vessels reached 5,541, with a total tonnage of 78,543. There has been little increase in the number of sampans without power and bamboo rafts due to the fact that they are less efficient and a number of them have installed engines. At the end of 1960, the number of sampans was 5,196 and bamboo rafts totalled 16,587.

2. Improvement of fishing ports and shore facilities. Taiwan has a coastal line of 1,600 kilometers (1,000 miles) not including some 70 small offshore islands. The two largest and most important fishing ports are Keelung and Kaohsiung. Next in importance are Suao, Makung, Hualien, Hinkang, and Anping. To safeguard the fishing vessels from typhoon damage and to develop the fishing industry, considerable funds are spent each year for the construction and improvements of fishing ports. Since 1956 the annual amount spent for fishing harbor construction and repair averaged NT$17,000,000. In addition, to meet the growing needs of the fishing villages and fishing ports, shore facilities including cold storage plants, storage houses, and boat repairing yards were constructed.

3. Education and research. As the fishing industry becomes more and more important to Taiwan's economy, the government has been giving increased attention to education and research in the field of fisheries. Established are three vocational
schools with a three-year curriculum and one marine college offering courses in navigation, marine engineering, and fisheries science. In addition, National Taiwan University has a fishery biology section under the Department of Zoology, College of Science, to give instructions in ichthyology, oceanography, and other allied subjects.

The five schools above mentioned are established educational institutions. Short-term training classes have also been conducted by local governments from time to time to impart knowledge and skills to fishermen in general.

The Taiwan Fisheries Research Institute of the Provincial Government and the Institute of Fishery Biology of National Taiwan University carry out research work in fisheries. The former also maintains several fish culture stations and fish propagation stations to produce millions of fish fingerlings for distribution to fish farmers.

The efforts have not been without rewards. Its success may be judged from the 113 per cent production increase in nine years from 122,000 metric tons in 1952 to 259,000 metric tons in 1960. Table 6 shows the fish production in Taiwan for 1952 and 1960.

Of the four categories, the deep-sea fisheries have shown the most remarkable progress, followed by the inshore fisheries. Production from the deep-sea fisheries increased as much as 360 per cent in 1960 over 1952. During the same period, production from the inshore fisheries increased by 224 per cent and that from fish culture rose by 66 per cent. On the other hand, the coastal fisheries have suffered
Table 6. Production of Taiwan Fisheries 1952 and 1960

<table>
<thead>
<tr>
<th>Categories</th>
<th>1952 (In metric tons)</th>
<th>1960</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep sea</td>
<td>18,514</td>
<td>85,210</td>
<td>360%</td>
</tr>
<tr>
<td>Inshore</td>
<td>29,696</td>
<td>94,856</td>
<td>224</td>
</tr>
<tr>
<td>Coastal</td>
<td>43,903</td>
<td>30,044</td>
<td>-33</td>
</tr>
<tr>
<td>Pond</td>
<td>29,530</td>
<td>49,030</td>
<td>66</td>
</tr>
<tr>
<td>Total</td>
<td>121,697</td>
<td>259,140</td>
<td>113</td>
</tr>
</tbody>
</table>


a decline in production, which went down 33 per cent in 1960 as compared with 1952.

The remarkable increase in deep-sea and inshore fisheries production came about chiefly as a result of an increase in powered fishing crafts, expansion of fishing grounds, and improvement in fishing methods.

The increase in fish culture production was due to an increase in unit area production as a result of improvement in culture methods rather than to any enlargement of acreage.

The downward trend in coastal fisheries production was caused by a decrease in the number of nonpowered fishing crafts (i.e., sampans and bamboo rafts) as a result of motorization and subsequent statistical adjustments.

Fishery products in 1960 were valued at a total of NT$2,525 million (U.S. $63 million).
Power

The rate of growth of Taiwan's power industry is rapid. In 1946 power generation totalled only 472,002,000 kilowatt-hours. In 1961 the output reached 4,084,000,000 kilowatt-hours, an increase of more than nine times in 15 years.

The power industry in Taiwan is operated by the government. The Taiwan Power Company (Taipower) was organized in 1946. Ninety-two per cent of the capital stock is owned by the government and the remaining 8 per cent is held by private individuals.

The years after 1950 were marked by rapid industrial growth in Taiwan. This growth was stimulated first by the arrival of people from mainland China, who created a market for consumer goods industries, and later by the creation of an export market for a number of industrial products as well as consumer goods further spurred the growth of industry. To meet the needs of rapid growth of people and industry, Taipower's system also underwent rapid expansion. Highlights of the major expansions in generating capacity covered by two development programs since 1950 were:

1. Wulai Hydro Station, a new station, installed capacity 22,500 kilowatts in two units.

2. Three units of 26,500 kilowatts each at Tienlun Hydro Station as a preliminary stage in the development of the Tachia River Project.

3. Washeh Project consisting of Washeh Dam, designed by the United States Bureau of Reclamation and contributing 42,000
kilowatts firm power from its storage reservoir, and the addition of 20,700 kilowatts installed capacity at the Wusheh Station.

4. Lungchien Hydro Station, an underground station on the east coast, with installed capacity 48,600 kilowatts.

5. Rehabilitation of Tungmen Hydro Station on the east coast involving the construction of a new underground powerhouse, installed capacity 21,000 kilowatts.

6. Two 20,000 kilowatt steam units at Peipu Station near Keelung.

7. Two 40,000 kilowatt steam units at the new Nanpu Station in Kaohsiung.

8. Two units, each 45,000 kilowatts, at the new Kukuan Hydro Station.

9. One 75,000 kilowatt and one 125,000 kilowatt steam unit at new Shensao Thermal Station.

At the end of 1961 Taipower operated 32 power stations with a total installed capacity of 923,420 kilowatts. There are 24 hydro stations, with a generating capacity of 537,970 kilowatts, or 58.3 per cent of the total capacity. There are eight thermal stations, with a capacity of 385,450 kilowatts, or 41.7 per cent of the total power supply.

Both the government and Taipower's management fully recognize the importance of power to economic development. Together the government and Taipower have mapped out an expansion program which forms a major area of the Third Four-Year Economic Development Plan which began in
TAIWAN POWER SYSTEM
Total Installed Capacity
End 1960 709,000-kw
1966-67 1,741,000-kw

Shihmen Reservoir Project
under construction
90,000-kw (1963)

Tachien Reservoir Project
under construction
360,000-kw (1966)

Kukuan Project
under construction
90,000-kw (1961)
90,000-kw (1964)

Tienlun Station
79,500-kw in operation
26,500-kw, planned (1966)

Shenao Station
75,000-kw in operation
125,000-kw under construction (1961)

Nanpu Station
80,000-kw in operation
125,000-kw under construction (1963)

New Thermal Station
125,000-kw, planned (1964)

Figure II. Map of Taiwan power system
1961, as well as long-range development and expansion plans up through 1968, including the Tachie River Project, designed to bring about a balance in power demand and supply and to bring the system capacity of 709,000 kilowatts from the end of 1960 to 1,741,000 kilowatts around 1967. This project will be accompanied by a number of smaller but equally important projects.

Transportation and Communications

Being an island, Taiwan is linked to the outside world by water and air transportation while its inland transportation is mainly railroad and highway. Development of transportation and communication services in Taiwan in the past decade is summarized as follows:

1. Though total ship tonnage evacuated from the Chinese mainland in 1949 amounted to over 400,000 tons, less than one-half was fit for operation. Replacement and expansion programs were subsequently launched and about 200,000 tons of obsolete ships were replaced with new ones in addition to the building of 100,000 tons of new ships. At present, a new program covering about 100,000 tons of new ships is being undertaken by both public and private shipping lines. Regular and tramp lines of the Republic of China are now calling on about 150 ports all over the world. Shore facilities, such as berths, loading equipment, and warehouses, have been well developed to meet increasing trade needs. The port facilities of both Kaohsiung and Keelung are suitable for accommodating large ocean liners.
2. Taiwan is served by five international air carriers; namely, the Northwest Orient Airlines, Cathay Pacific Airways, Thai Airways, Japan Air Lines, and Civil Air Transport. The last is a Taiwan-based Chinese flag airline; it carries a major part of Taiwan's international air traffic.

Scheduled flights of these airlines link Taipei with Bangkok, Hong Kong, Manila, Okinawa, Seoul, Osaka, and Tokyo. Chartered flights are operated by Civil Air Transport, China Air Lines, and Far Eastern Air Transport Corporation.

Airports of international standard equipped with all up-to-date navigation facilities and suitable for the handling of modern large aircrafts have been built in important points of the island.

3. The railway system of Taiwan was severely damaged during World War II and its rehabilitation had involved the replacement of ties and the change to heavier rails for heavier traffic. A modern signalling system including the installation of a centralized traffic control system, the first one in Asia and the Far East, has been installed to cope with an ever increasing traffic load. From 1952 to 1960, passenger traffic on railways rose by about 95 per cent in terms of passenger-kilometers and freight traffic by about 65 per cent in terms of ton-kilometers.

4. The total length of highways in Taiwan amounted to 16,228 kilometers (10,115 miles), 10 per cent of which is of
A number of road construction and betterment projects have been implemented in recent years. One of the most important constructions is the Cross-Island Highway, with a total length of 308 kilometers (192.5 miles). Its construction has been a herculean piece of work, as much difficulty was involved in opening the almost impassable mountainous interior of the island. Another east-west cross-island highway in the northern part is now in the planning stage. The opening of these highways, cutting through the central mountain range, will help develop the eastern coast of Taiwan, aside from providing speedier cross-island traffic.

About 1,000 highway buses are operated by the government with an average daily mileage of 144,000 kilometers and 298,000 passengers, or 4,240,000 passenger-kilometers per day. There are 20 private companies operating about 1,000 buses with a daily load of 3,069,000 passenger-kilometers. Highway bus service in Taiwan has been increased by over 10 times since the end of World War II. There are about 2,500 trucks run by private companies for short-distance hauls of cargoes.

5. As to communications, the public demand for new telephones in the cities has been increasing rapidly. The number of city telephones increased from 22,322 in 1945 to 374,168 at the end of 1961. Taiwan is connected with all major cities abroad by radio telephones. Domestic telephone service has
Figure III. Map of Taiwan transportation systems
taken away much of the domestic telegraph business. International wire service is offered by some 300 cable offices of the Taiwan Telecommunications Administration. Taiwan maintains 17 direct lines with foreign lands and has five telephoto circuits.

6. Postal service in Taiwan is administered in the form of an enterprise, run with high efficiency and reliability. The Taiwan Postal Administration has a fleet of 4,504 mobile post offices. In addition to regular mail delivery, the Administration handles about 1,300,000 pieces of mail by special delivery every month. Its efficiency approaches that of France and West Germany. In the prewar period, the highest rate of increase in the volume of mails handled was recorded in the period from 1931 to 1942, with an annual increase from 2 to 3 million pieces. In the postwar period, the annual mail increase has jumped from 10 to 80 million pieces. In 1960, about 400 million pieces of mail were handled by the postal service.

It can be seen from the above that efficient transportation and communication systems have been developed in the past decade, by which people in Taiwan travel with speed, in comfort, and are efficiently connected both at home and abroad with telecommunication links.

**Foreign Exchange and Trade**

Trade stimulates growth in many ways, of which its stimulus to specialization is only one. Trade stimulates demand by introducing new
goods to a community, and in doing so it may stimulate the desire to work more, or more effectively. Trade also reduces the community's need for working capital. In the absence of trade, each household must keep stocks of all it needs. Trade also brings new ideas—new patterns of consumption, new techniques, or new ideas of social relationships. If in studying the history of any country we find that it is suddenly showing more rapid growth, or changes in beliefs, or changes in social relations, the explanation is almost always that there has been an increase in opportunities for trade.

The size of the domestic market in Taiwan is small. The obvious solution to this problem is international trade. Not only is export volume necessary to provide market support to production facilities but exports also provide the foreign exchange needed for capital equipment and imported supplies. Foreign exchange and trade control performed in the past decade are summarized as follows:

1. **Enforcement of a unified rate of exchange.** Since the government enforced the new foreign and trade control measures in April, 1958, foreign exchange rates have undergone several changes. The changes are aimed at gradually reaching a unitary rate, so that the new Taiwan Dollar currency can be exchanged freely with foreign currencies in compliance with the policy of the International Monetary Fund and in coordination with the requirements of domestic economic development. The unified exchange rate of NT$36.38 to U.S. $1.00 adopted in November, 1958, was composed of the basic rate
NT$24.78 plus foreign exchange certificate selling rate
NT$11.60 and was cumbersome for calculation. Therefore,
the government fixed the exchange rate at NT$36.38 to
U.S. $1.00 on August, 1959.

Beginning in September, 1959, the government gradu-
ally extended the use of the new exchange certificate. Until
July, 1960, all imports and outward remittances, whether
public or private, were required to surrender and all exports
and inward remittances were given equivalent amounts of new
exchange certificates. Since then, the effective exchange
settlement rate has remained steady around NT$40.00 to
U.S. $1.00 and is only 10 per cent more than the official
rate and 10 per cent less than the black market rate. The
margins of difference are smaller than in any previous years.
The government's reform effort since April, 1958, may be said
to have been fairly successful.

2. Promotion of foreign trade. Promotion of export trade has
been the joint objective of both government and private
manufacturers. In addition to the efforts made in unifying
the exchange rate as described above, the government has
implemented the measures of "Assistance to processing
trade," "Insurance for exports," and "Increasing export
loans." As a result of the government's efforts in promoting
export trade, the total exchange receipt from export has
been increased from U.S. $120 million in 1952 to U.S. $170
million in 1960. But a substantial import surplus has continued to exist in the past decade. An average of U.S. $30,000,000 of import surplus a year has mainly been covered by United States aid. Imports financed with United States aid totalled U.S. $792,000,000 from January, 1952, to December, 1960, at a yearly average of U.S. $38,000,000 and accounted for 36 per cent of the total imports or 53.5 per cent of the total exports in 1960. It appears that Taiwan will have to depend on United States aid for some time and must devote much more time and effort before it will be able to finance all the imports required for economic development with its own resources. Table 7 shows the situation of imports and exports of Taiwan from 1952 to 1960, inclusive.

Table 7. Imports and Exports of Taiwan

<table>
<thead>
<tr>
<th>Year</th>
<th>Exports</th>
<th>Total</th>
<th>Bank's exchange settlement</th>
<th>U.S. aid</th>
<th>Others</th>
<th>Deficit</th>
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<tbody>
<tr>
<td>1952</td>
<td>119,527</td>
<td>206,980</td>
<td>115,228</td>
<td>89,062</td>
<td>2,090</td>
<td>87,453</td>
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<tr>
<td>1953</td>
<td>129,793</td>
<td>190,597</td>
<td>100,569</td>
<td>84,007</td>
<td>6,021</td>
<td>60,804</td>
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<td>1954</td>
<td>97,756</td>
<td>203,976</td>
<td>110,217</td>
<td>87,840</td>
<td>5,919</td>
<td>106,220</td>
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<tr>
<td>1955</td>
<td>133,441</td>
<td>190,065</td>
<td>91,640</td>
<td>89,170</td>
<td>9,255</td>
<td>56,624</td>
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<tr>
<td>1956</td>
<td>130,060</td>
<td>228,225</td>
<td>114,360</td>
<td>96,480</td>
<td>17,379</td>
<td>98,165</td>
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<tr>
<td>1957</td>
<td>168,506</td>
<td>252,235</td>
<td>138,797</td>
<td>98,745</td>
<td>14,693</td>
<td>83,729</td>
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<td>1958</td>
<td>164,433</td>
<td>232,785</td>
<td>127,652</td>
<td>82,339</td>
<td>22,794</td>
<td>68,352</td>
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<td>1959</td>
<td>160,540</td>
<td>244,367</td>
<td>150,366</td>
<td>73,441</td>
<td>20,560</td>
<td>83,827</td>
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<tr>
<td>1960</td>
<td>169,866</td>
<td>252,216</td>
<td>143,233</td>
<td>90,892</td>
<td>18,091</td>
<td>82,350</td>
</tr>
</tbody>
</table>

Unit: U.S. $1,000

Source: Bank of Taiwan and CUSA
Tourism

Taiwan has two major tourism assets working for it. The first is its geographic location astride the main air route between Japan and Hong Kong. In 1960 well over 50,000 international tourists flew between Tokyo and Hong Kong. It is estimated that more than 500,000 tourists will be visiting Japan in 1968, and a large proportion of these tourists will be flying to Hong Kong. Accordingly, they will be passing right over the island of Taiwan and, therefore, constitute a major market that can readily be reached and drawn in.

The second major asset is Taiwan's Chinese atmosphere. Its Chinese background, customs, tradition, food, culture, and way of life are of real interest to tourists—much more so than scenery or climate.

So far, Taiwan has not used tourism as a tool for economic development. In recent years the government has awakened to the fact that the tourism is also one of many important segments to economic development. The Tourism Council of the Ministry of Communications was organized in September, 1960. Its membership consists of representatives from all agencies concerned so that tourist policies may be smoothly and expeditiously carried out. It has mapped out a Four-Year Plan to promote tourism in Taiwan. During the period from 1961 to 1965, the government and private organizations are expected to invest NT$384,100,000 (roughly equal to U.S. $10 million), in addition to other sources. Successful implementation of this plan is expected to bring 100,000 tourists and a total revenue of U.S. $10,000,000 to Taiwan in these four years.
Major items of the Four-Year Plan are: (1) improving and beautifying the scenic spots and improving the access roads, (2) investment promotion in tourist hotels, (3) construction of the Palace Museum in suburban Taipei, (4) expansion of publicity campaigns, (5) formation of laws and regulations governing tourism, (6) encouragement and development of inland tours, (7) strengthening governmental tourist agencies, and (8) assistance to private enterprises and organizations.

Social Progress

Hand in hand with Taiwan's economic development, great strides have been made in social development in the period under review. The following is a condensed report on education, public health, social security, and housing programs undertaken in Taiwan.

1. Education. Even before World War II, education in Taiwan had been widespread with a fine school system. Elementary education was free and compulsory for children between six and 12 years of age. Secondary and higher education and vocational education were also well developed. In parallel with the population growth and economic development, education also experienced a remarkable expansion in the past 11 years. Between 1949 and 1960, total school enrollment rose from 1 million to 2.4 million, or from 14 per cent to 22 per cent of the island's population. The percentage of school-age children actually attending schools increased from 79 per cent in 1949 to 96 per cent in 1960. In the past 11 years,
the number of schools at all levels went up from 1,600 to 3,600, and that of teachers and school employees from 31,000 to 79,000. By the end of 1958, there were 884,928 illiterates in Taiwan, constituting less than 10 per cent of the population.

2. Public Health. Rapid progress has been made in the field of public health due to the availability of a large number of medical personnel and vigorous public health programs. Medical services are within reach of all inhabitants in the rural areas and even remote villages in the mountainous interior of Taiwan. The registered doctors, dentists, nurses, and other medical workers increased from 8,000 in 1952 to 17,000 in 1960. Public medical units increased from 400 in 1949 to 1,100 in 1960. Whereas the number of persons served by each public medical unit and that by each medical worker averaged 14,000 and 930, respectively, in 1951, they were reduced to 9,900 and 640, respectively, in 1960. To further improve its public health system, an Institute of Public Health has been established at the National Taiwan University Medical College, and courses on nursing, environmental sanitation, and the like have been set up in colleges and universities. Many of the medical and nursing professions receive further training abroad.

3. Social Security. A national social security system has long been in the process of development. The Labor Insurance
Program was instituted in 1950, and the number of insured grew from 130,000 in 1950 to 530,000 in 1960. It provides compensation for maternity, injury, sickness, disability, old age, and death. A portion of the premiums is borne by the government, while the employer is required by law to pay 75 per cent of the balance. The Civil Servants Insurance Program was started in August, 1958. At the end of 1960, the number of insured under this program already reached 200,000. The government pays 65 per cent of the premiums, while the employee pays the balance. If the families of the insured were included, the two programs together provide insurance benefits to approximately one-third of the total population in Taiwan.

This chapter's figures and data were gathered from many resources. Most of them are also available from the China Yearbook, 1961 to 1962.
CHAPTER V
CAPITAL REQUIREMENT FOR ECONOMIC DEVELOPMENT

Capital investment (or capital formation) is necessary for economic development. It is usually defined as the part of a country's total production, plus imports, which is not consumed or exported but saved to create additions to the stock of capital goods. In other words, capital formation is the portion of goods and services that is left after domestic consumption for later use to create new goods and services. It is the very core of economic growth regardless of what economic system is involved.

New or improved roads, irrigation systems, schools, better seeds and livestock, reclaimed lands, and so on are all added to the existing stock of capital and resources to increase production and raise the level of productivity.

The principal question is how much capital is required in a certain country during its beginning period of development. This can be answered in two parts: one is related to how much capital is required by each worker; and the other, on the aggregate level, is how much capital is required to lift economic growth to some given level under certain given conditions.

From the point of view of employment, capital requirements depend not only on the number of jobs but also on the nature of work to be done.

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The underdeveloped countries have a large proportion of employment in agriculture. Hence, part of the problem is often how to transfer some of the rural population to the industrial sector. A United Nations study in 1951 indicated that U.S. $2,500 was required for each worker to be transferred to nonagricultural employment, with each outlay covering all costs including those for industrial research and training per worker capital requirement varying also by industries. In Taiwan, for the Second Four-Year Economic Development Plan, per worker capital requirement was estimated from NT$17,450 (U.S. $520) in coal mines, NT$162,800 (U.S. $4,800) in petroleum industry, and NT$178,700 (U.S. $5,000) in the electric generating industry. In general, it requires more capital to move rural people into industries producing capital goods than into those producing consumer goods.

How much total investment is required to achieve the target increase in a given level of per capita income? In answering this question, we should know the relationship between the investment and the relevant increase of output resulting from this investment. As known, this relationship is termed as "Capital-Output Ratio." The capital-output ratio differs from country to country, and also varies from one period to another in the same country. The ratio will obviously differ from industry to industry at a given period in the same country. There is rough evidence that it takes about $3 to $4 of new capital goods to increase current income by about $1 annually in the Western

\[\text{2 UN, Measures for Economic Development of Underdevelopment Countries, 1951, p. 77.}\]
countries (a "capital-output ratio" of say 4 to 1). In this case, an economy that can save 4 per cent of its income will, other things equal, increase its national income by about 1 per cent annually. If the population grows at about 1 per cent annually, per capita income is just held constant. If we know the value of capital-output ratio of one developing country and the current rate of population growth, then we can calculate the percentage of income that country should save for investment in order to maintain the desired rate of economic growth.

**Domestic Capital Formation**

Investment in Taiwan undertaken during its economic planning period was not large enough to lift Taiwan's economy significantly above the subsistence level. This may be observed from Table 8 in which we shall try to gauge roughly the proportion of Taiwan's net domestic capital formation after 1952. The statistical estimate of national income, capital formation, savings, and assumed capital consumption allowance may be, of course, subject to wide errors. Nevertheless, two trends are clearly indicated: (1) Net domestic capital formation, as a percentage of net national income, declined from 1952 to 1956. However, it increased during the next three years. (2) Domestic savings, as a percentage of net national income, were around 5 to 6 per cent during the period of 1952 to 1957 and increased to about 10 per cent in 1958 and 1959. The declining rate of capital formation and the

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## Table 8. Domestic Capital Formation and Savings in Taiwan 1952-1959

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gross national production (GNP)</td>
<td>15,748</td>
<td>21,200</td>
<td>23,154</td>
<td>27,885</td>
<td>32,297</td>
<td>37,985</td>
<td>41,650</td>
<td>48,228</td>
</tr>
<tr>
<td>2. Net national production (NNP)(^a)</td>
<td>13,047</td>
<td>17,782</td>
<td>18,307</td>
<td>22,561</td>
<td>26,041</td>
<td>29,982</td>
<td>32,827</td>
<td>38,011</td>
</tr>
<tr>
<td>3. Gross capital formation (GCF)</td>
<td>2,887</td>
<td>3,519</td>
<td>3,923</td>
<td>4,264</td>
<td>4,858</td>
<td>6,253</td>
<td>7,574</td>
<td>8,278</td>
</tr>
<tr>
<td>4. Gross fixed capital formation (GFCF)</td>
<td>2,019</td>
<td>2,540</td>
<td>2,737</td>
<td>3,487</td>
<td>4,007</td>
<td>5,004</td>
<td>6,381</td>
<td>--</td>
</tr>
<tr>
<td>5. Capital consumption allowance</td>
<td>831</td>
<td>906</td>
<td>1,159</td>
<td>1,401</td>
<td>1,767</td>
<td>2,368</td>
<td>2,613</td>
<td>3,024</td>
</tr>
<tr>
<td>6. Net capital formation (NCF)</td>
<td>2,056</td>
<td>2,613</td>
<td>2,764</td>
<td>2,863</td>
<td>3,091</td>
<td>3,885</td>
<td>4,961</td>
<td>5,254</td>
</tr>
<tr>
<td>7. Private savings(^b)</td>
<td>632</td>
<td>832</td>
<td>1,114</td>
<td>1,354</td>
<td>1,461</td>
<td>2,013</td>
<td>3,435</td>
<td>3,859</td>
</tr>
<tr>
<td>8. GCF/GNP</td>
<td>18.3</td>
<td>16.6</td>
<td>16.9</td>
<td>15.3</td>
<td>15.5</td>
<td>16.5</td>
<td>18.2</td>
<td>17.2</td>
</tr>
<tr>
<td>9. GFCF/GNP</td>
<td>12.3</td>
<td>12.0</td>
<td>11.8</td>
<td>12.5</td>
<td>12.4</td>
<td>13.3</td>
<td>15.3</td>
<td>--</td>
</tr>
<tr>
<td>10. NCF/NNP</td>
<td>15.8</td>
<td>14.6</td>
<td>14.7</td>
<td>12.7</td>
<td>11.2</td>
<td>13.0</td>
<td>15.1</td>
<td>13.8</td>
</tr>
<tr>
<td>11. S/NNP</td>
<td>4.8</td>
<td>6.2</td>
<td>5.9</td>
<td>6.0</td>
<td>5.6</td>
<td>6.7</td>
<td>10.5</td>
<td>10.2</td>
</tr>
<tr>
<td>12. (11)-(10)</td>
<td>-9.0</td>
<td>-8.4</td>
<td>-8.8</td>
<td>-6.7</td>
<td>-6.3</td>
<td>-6.3</td>
<td>-4.6</td>
<td>-3.8</td>
</tr>
</tbody>
</table>

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\(^a\)Net national income at market prices.  
\(^b\)Private savings include personal time deposits, preferential interest rate deposits, and lottery time deposits.  
small amount of domestic savings have been major factors checking the rate of economic growth.

From line 12 of Table 8, we know that domestic savings of Taiwan during the total period of 1952 to 1959 were less than domestic net capital formation. The difference between domestic savings and the domestic capital formation was largely financed with the help of external aid. It is not uncommon in developing countries to have a part of capital formation financed by such foreign aid or donations. In spite of the large amount of foreign aid, the rate of capital formation in Taiwan is still low for really rapid economic development considering the high rate of population growth.

There are two decisive factors affecting capital formation in Taiwan, which are discussed as follows:

1. The high propensity to consume. National income is used for either consumption or investment. The larger the propensity to save the smaller the propensity to consume. The high propensity to consume of Taiwan is contrary to traditional traits of the Chinese people. Thrift and hard-working attitudes of the Chinese people are well known to the world. There is also the well-known economic dominance of Chinese people in southeast Asian countries and remarkable economic development in Hong Kong in the recent years brought about chiefly by Chinese refugees. There is no apparent reason why Chinese people in Taiwan should be different from those elsewhere.
The extraordinarily high propensity to consume could be the result of two factors. First, from a national aggregative viewpoint is the heavy burden of military expenditures. Second is the undisciplined personal consumption.

Taiwan's high propensity to consume can be clarified. Rural people spend a great deal of money on religious activities while the urban people are strongly influenced by the "demonstration effects." Celebration of one important traditional custom of Taiwan is called "bye-bye" which in dialect means worship of gods. When the "bye-bye" comes, every family invites friends and relatives, even strangers, to dinner. Those who have the most guests will be respected by their neighbors. In 1959 each family spent at least NT$500 (U.S. $1.50) for "bye-bye." Suppose 60 per cent of the total households had "bye-bye"; 1.2 million families then spent on this event U.S. $18 million which was more than one-fifth of the United States' aid to Taiwan in that year.

In addition, a large amount of money is still being spent to build temples and tombs and on ancestor worship as well as funerals. All of these are nonproductive in a restricted economic sense.

Luxurious consumption patterns brought in by the Chinese mainlanders and a great inflow of foreign visitors, officials, and servicemen step up the "demonstration effects." People admire the foreign-made consumer goods and are led
to spend a large proportion of their income to buy fashionable clothes, durable goods, and so on just to keep up with the Jones's.

Government expenditure is of two major kinds. One is capital investment such as road construction and irrigation projects; the second is administrative expenditures such as national defense and foreign affairs. Government expenditures in these two categories usually depend on national policy. In Taiwan, expenditures for national defense take a large bite out of the national budget each year. Average expenditures on defense run about 60 per cent of the annual national budget. The heavy burden of military expenses in Taiwan makes it difficult to finance needed government investment in economic development.

2. Population growth. Population growth may be an important positive factor in economic development if a country is less densely populated.

Because of Taiwan's limited natural resources and its small land area, its population lays a heavy hand on national income.

Increased population in Taiwan has had two effects. The first is the increase in the number of consumers, and the second is a change in the structure of population; that is, a rapidly growing population has a high percentage of children. These children are not productive until they are 15.
years old or more. Before that, their living depends on the so-called "economically active" population. The percentage of children under 15 years old increased from 41.4 to 45.4 in the short period between 1950 and 1960. The median age of the population of Taiwan was 17.61 years in 1960. In comparison, it was 11.7 years younger than that of the United States population. A study made by a Chinese economist shows that per capita income, savings, and personal consumption would have increased at a more rapid rate had the island's population growth been only 1.5 per cent per annum. According to this study, the results would be as follows:

A total of NT$4,278 million (at 1952 prices) of consumption could be saved during the six-year period (1953-1959). Per capita income would increase by 7 per cent each year and personal consumption by 6 per cent. The rate of capital formation would be 9 per cent greater than the present rate.

Inflow of Foreign Capital and Aid

Foreign aid and capital can help retarded countries speed up their economic development without reducing their consumption during the development period. In order to channel capital from economically advanced countries to the developing regions, there are a number of aid

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5 K. Y. Yin, If the Rate of Population Growth Had Been 1.5 Per Cent in Taiwan, Industry of Free China, Vol. II, No. 4, April, 1959, pp. 2-15.
programs under the auspices of both free and communist countries. These aids are either in the form of material or of technical assistance. The United States of America is the chief donor and spends millions of dollars each year to advance development and check the spread of Communists in the lesser developed countries. American financial aid has played a very important role in the process of Taiwan's economic development. Besides the United States' aid, the inflow of foreign nationals and overseas private capital has also played a minor role in the economic development of Taiwan.

1. The United States Aid

United States economic aid to China officially began on July 3, 1948, when the governments of the Republic of China and the United States of America entered into a bilateral agreement in Nanking, China, based on the United States Economic Cooperation Act. Unfortunately, only U.S. $170 million of the first appropriation of U.S. $275 million in aid was disbursed before it was suspended following the loss of the China mainland. The American government transferred its assistance to Taiwan since the second half of 1950 following the outbreak of the Korean War. By the end of June, 1961, Taiwan had received from United States aid a total of U.S. $1,172 million used for economic development. The annual amount of aid averaged about U.S. $105 million or about 10 per cent of its gross national product of recent years.6

United States economic aid is extended to Taiwan in the form of consumers' goods, industrial and agricultural raw materials, industrial and mining equipment, capital goods, and technical services. The purpose is to stabilize and develop China's economy. As stated in the Sino-American Bilateral Agreement, the objectives of United States economic aid are: (1) to stabilize China's economy so as to attain internal equilibrium, (2) to cut down China's foreign exchange expenditures so as to balance its international payments and receipts, and (3) to promote China's industrial and agricultural development so as to pave the way for economic reconstruction. The ultimate aim, however, is to strengthen China's defense position.

The following table (Table 9) shows the type and total amount of United States economic aid of 11 years from 1951 to 1961.

Table 9. Type and Total Amount of United States Economic Aid to Taiwan 1951-1961

<table>
<thead>
<tr>
<th>Type of aid</th>
<th>Amount (U.S. dollar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1,169,827,000</td>
</tr>
<tr>
<td>General economic aid</td>
<td></td>
</tr>
<tr>
<td>Defense support - Project</td>
<td>276,842,000</td>
</tr>
<tr>
<td>Nonproject</td>
<td>668,367,000</td>
</tr>
<tr>
<td>Technical cooperation</td>
<td>20,840,000</td>
</tr>
<tr>
<td>PL 403 surplus agricultural commodities</td>
<td>83,542,000</td>
</tr>
<tr>
<td>Development loan fund</td>
<td>119,736,000</td>
</tr>
</tbody>
</table>

The aid is used mainly for economic and social development, although a small portion is for defense purposes. After the primary aid goods or services have arrived in Taiwan, they are either sold in local markets or directly handed over to end-users. Except for certain projects which are on a grant basis or whose local currency counterpart payments are to be deferred, the Chinese government or aid recipients are required to deposit local currency equivalent to the value of aid goods or services into a special account, from which funds are again made available to qualified projects in the form of loans or grants. Loans repaid upon maturity plus interest are redepósited into the special account for further utilization. The continuous process greatly increases the usefulness of United States aid. Local currency thus generated is generally known as local currency aid fund.

United States economic aid has played a very important role in the process of Taiwan's economic development. Imports of raw materials such as cotton, soybeans, and capital equipment were largely financed by such aid. Taiwan's balance of payment was brought into equilibrium through such aid. The percentage of total gross fixed capital formation financed by the aid increased from 16.5 per cent in 1952 to 36.3 per cent in 1957 and was still 31.0 per cent in 1958. 7

7International Cooperation Administration Mission to China (ICA, CM), Taiwan Gross Capital Formation, 1959, Taipei, Taiwan, China.
2. Investment of foreign nationals and overseas Chinese

The inflow of private foreign capital played a minor role in the economic development. In order to attract such capital, the government has made every effort to improve Taiwan's investment climate such as an exemption from taxes for a certain period of time and permission to remit profits to home countries freely. This also renders help in obtaining factory sites, raw material supplies, electric power, and the like. A total of U.S. $108 million in foreign capital has moved to this island in the past decade. More than 75 per cent of this came from overseas Chinese—largely from Indonesia and other southeastern Asian countries. And the rest came from various foreign nationals—more than half from the Japanese. Most foreign capital has been invested in the manufacturing industries and a little in mining and other industries.

The rather small amount of such capital is explained by two factors: (1) Taiwan is under the threat of communist aggression and (2) Taiwan is still lacking in a favorable investment. It is reported that the government continues to work hard trying to remove all barriers to the inflow of foreign capital. Japanese firms have responded to this request and have invested large amounts in Taiwan recently, but capital inflow from other parts of the world is still insignificant.

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CHAPTER VI

AGRICULTURAL CREDIT

Taiwan is predominantly agricultural. One-fourth of its total area is farm land; more than a half of the population is engaged in agriculture. The net national product originating from agriculture accounted for 29 per cent of the total in 1960. Agricultural and processed agricultural products constituted 68 per cent of the total exports. Agriculture has played an important role in the processing of economic development and is still a major sector of the national economy at present.

The salient features of Taiwan's agriculture are the multiplicity of its small holdings because of its density of population and small area. Taiwan farms are so small, each farm family cultivating 2.8 acres of land on an average, and so poor that they are unable to obtain credit from large banks or other commercial credit agencies. Indeed, most farmers are forced to depend for credit on private money lenders to whom they pay the highest rates of interest for credit, which is not well suited to their needs.

Certain unique features of agricultural credit make it impossible for commercial banks to extend their loans in rural areas. Those features are the need for long-term loans at low interest rates and the high cost of operation when loans are made to many small borrowers. This makes government sponsorship of agricultural credit research and extension imperative.
Agricultural Credit Institutions

In order to satisfy the criteria of a good agricultural credit system, it will normally be necessary for the structure and procedures of credit institutions to be so designed as to promote decentralized methods of operation. An agricultural credit institution cannot operate effectively from a remote center. In this connection, the farmers' associations in Taiwan occupy an excellent position in taking savings deposits from and making farm loans to farmers in townships where each of the associations is located. Of 322 township farmers' associations at present, 290 offer credit services. ¹ With their many years of experience in credit operation coupled with government assistance, the credit services have been improved. Besides carrying out their own credit business, they are credit agents for the Land Bank and the Cooperative Bank, which have branches only in principal cities and towns and, therefore, are dependent on the farmers' associations to better serve agriculture in remote areas.

The Land Bank of Taiwan, established in 1946, is entirely government-owned, with assets, liabilities, and activities taken over from Taiwan branches of the Hypothec Bank of Japan. With its headquarters in Taipei, the Land Bank today has 27 branches throughout Taiwan Province and one on the Kinmin Islands.² Chartered to accommodate land financial needs, promote agricultural and forestry developments, and


²The Land Bank of Taiwan, Organization and Function of Land Bank of Taiwan, 1959, p. 3.
assist the government in carrying out land and agricultural policies, the bank extends credit related to agriculture under categories of farm production loans, irrigation loans, fishery loans, loans to farmers' associations, farm ownership loans, land improvement loans, land consolidation loans, agricultural marketing loans, and housing loans to farmers and fishermen.

The Cooperative Bank of Taiwan is another agricultural credit institution which was established in 1946 by reorganizing the Taiwan Cooperative Treasury initiated in 1923. Having its headquarters in Taipei and 23 branches throughout the province, the bank acts as the bank for rural cooperatives as well as for urban ones. Except by some special arrangements, it does not deal directly with individual farmers, and loans are made to farmers and fishermen through their associations. Almost four-fifths of the loans are made to finance agricultural and fishery production under categories of agricultural production loans, loans to farmers' organizations as operating funds, fishery loans, marketing loans, processing loans, low-interest loans for rehabilitation, and commodity loans.

In addition to these two agricultural credit institutions, government enterprises are important lending agencies. They include the Provincial Food Bureau (rice), the Taiwan Sugar Corporation (sugar cane), and the Provincial Supply Bureau (jute). The lending operations were respectively started by the Monopoly Bureau in 1946, the Sugar

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Corporation in 1948, the Food Bureau in 1949, and the Supply Bureau in 1955. They extend a substantial amount of credit for the production of crops required in their operation for rationing, price stabilization, and other government purposes. These loans are made both in cash and in kind either to farmers directly or through the farmers' associations and are repaid with farmers' produce.

The weaknesses in the agricultural credit operation of Taiwan are particularly evident in the overlapping of lending programs and the difficulty to achieve a self-sustaining status of local credit units. Studies have been made by the government to deliberate on practical problems pertaining to the establishment of a sound agricultural credit system. A greater emphasis has been placed on these studies, including the structure and the operational methods of lending agencies as a whole.

**Progress and New Development**

To establish a sound agricultural credit system in Taiwan, the Agricultural Credit Plan for Taiwan, developed in 1960, was put into practice in 1961 under a project entitled "Unified Agricultural Credit Program." The objectives of the plan are (1) to create a permanent and dependable source of lending funds to finance agriculture at a reasonable rate of interest and on terms that meet the farmers' requirements and (2) to enable the agricultural credit institutions to achieve a self-sustaining status, operating with minimum duplication. This system is to be built within the general pattern of the agencies already set up for the purpose, with a planning and policy board at the top and the
network of farmers' association credit sections at the bottom serving individual farmers directly with credit. The cash loan programs of the government enterprises will eventually be consolidated into the operation of the regular credit institutions, after the farmers' association credit sections have improved and strengthened their financial conditions and have demonstrated their capability for the additional responsibilities.

The "Unified Agricultural Credit Program" has much improved the agricultural credit system in Taiwan since 1961. Proofs are given as follows.

1. Establishment of Agricultural Credit Fund

An Agricultural Credit Fund amounting to 300 million New Taiwan dollars is to be provided from the counterpart fund over a period of five years beginning in fiscal year 1961. Actual appropriation was made in the amount of NT$60 million in fiscal year 1961 and NT$80 million in fiscal year 1962. Two-thirds of the funds of fiscal years 1961 and 1962 were provided directly to 117 farmers' associations as noninterest-bearing loans to strengthen their lending capacity, and one-third to the Land Bank and the Cooperative Bank on a loan basis at cost to supplement their resources for giving rediscount to those participating farmers' associations.

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2. Establishment of Agricultural Credit Planning Board

An Agricultural Credit Planning Board was established for policy-making and planning for a coordinated agricultural credit system, including the determination of how much credit should and could be made available to agriculture and which aspects of it and which farm products should be given priority or special emphasis. The Board is composed of seven representatives from agencies concerned at national and provincial levels. Administration of the Agricultural Credit Fund is guided by the decisions of the Board.

3. Strengthening the financial condition and improving the operating procedures and practices of the credit sections of township farmers' associations

a. Each township farmers' association is given a noninterest-bearing loan from the Agricultural Credit Fund in an amount ranging from NT$500,000 to NT$1,000,000, depending on the area of farm land and number of farmers in the township. The farmers' associations are required to use all JCRR loans⁵ to extend credit to the farmers for general production purposes according to actual requirements of farming and on easier repayment schedules.

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⁵The Joint Commission on Rural Reconstruction is a Chinese-American joint organization empowered to formulate and carry out programs to help develop agriculture and improve rural livelihood of China with United States aid funds. It provides agricultural institutions and farmers' organizations with financial assistance, in the form of grants and loans, to help them carry out agricultural reconstruction, research, and extension work.
b. The funds of the credit section within a farmers' association are completely segregated from those of other sections.

c. The credit section of a farmers' association is not to transfer funds to any other section except for short-term purposes and in a limited amount of 5 per cent of its deposits.

d. All earnings made by the credit section of an association, after contributing 10 per cent to the extension section of the association, are accumulated as capital reserves.

e. Rules are made to encourage the farmers' associations to utilize farmers' deposits in extending farm credit. The lending procedures take after the pattern which has been established in the supervised agricultural credit projects.

4. Improving the financial resources and services of the Land Bank and the Cooperative Bank

a. In order to avoid duplication and competition between the Cooperative Bank and the Land Bank and to assure that all segments and aspects of agriculture are served, the respective areas of responsibilities of these two banks are delineated.

b. After the credit section of a farmers' association has utilized its deposits for lending purposes to the extent permissible, it will look to the Cooperative Bank for
credit to finance additional loans for terms not exceeding 12 months for agricultural and side-line production purposes. Under the same circumstances, it will offer loans that normally should run for a term longer than 12 months to the Land Bank.

c. The two banks agreed that, except for a special arrangement, all loans to be made by them for agricultural and side-line production purposes in townships where the farmers’ associations participating in the Unified Agricultural Credit Program are located will be extended through these associations.

d. The two banks will have access to loans and discounts from the Agricultural Credit Fund to supplement their own resources.

Present Situation with Emphasis on Problems

Under the conventional procedures and practices, the lending agencies in Taiwan are often preoccupied with the minimizing of operating costs and the safety of loans and, consequently, many remotely located farmers and low-income farmers have had little or no chance to obtain institutional credit. The experiences of government agricultural credit projects have demonstrated that the risks of extending loans to these farmers can be kept within bound by making effective supervision over the use of loans and by giving planning assistance to the farmers in operating their farms. Results from the supervised credit project operation have convinced the agricultural lending institutions in Taiwan
that collateral requirement could be relaxed if the credit operation was well coordinated with agricultural extension and marketing improvement. This type of credit service should be encouraged, and it is planned to include in the Unified Agricultural Credit Program all of the 290 farmers' associations which had a credit section by 1956. Problems are how to obtain well-qualified credit men to render improved credit service and how to train farmers to follow supervision and make good use of the advice given on their farm planning and operation.

1. Fitting credit programs into farmers' organizations

Whether an agricultural credit program succeeds or not depends very largely on the character and strength of the local credit units close to farmers. The farmers' associations in Taiwan, as described in the previous sections of this chapter, are in the ideal situation to render this credit service because of their knowledge of the farmers' circumstances and because they can coordinate the farmers' borrowings with their purchase of farm supplies and their marketing of farm products and with the association's extension service. The success of supervised credit operation in Taiwan is attributed to a great extent to the multiple services of the farmers' associations. Under the present condition, however, accurate appraisal of the status of a credit section can be made only through a complete audit of all sections of the farmers' association, since its activities are diversified and interrelated, and the assets and liabilities of different sections are combined. In other words, the multipurpose activities complicate the examination of the credit operation unless the credit section is given
a status of legal entity and its assets and liabilities are segregated from those of other sections.

Financial support to the extension programs of the farmers' associations is another important requirement. Unlike most other countries, the farmers' associations in Taiwan make the largest contribution in money and manpower to carry out the extension programs. The costs are paid from extension fees collected from members, government subsidies, and miscellaneous incomes in addition to the appropriation of 70 per cent of annual earnings realized by the credit section and the economic section. The government provides additional financial assistance to the farmers' associations participating in the Unified Agricultural Credit Program, in order to enable them to build up capital reserves for the government to take full responsibility in the extension programs as a part of its educational undertaking and pay the total costs for the implementation.

2. Source of capital and support for agricultural credit

The agricultural credit institutions are largely dependent on deposits which are unsuitable for agricultural loans except as a supplement to permanent capital. Demand deposit, though of low cost, is unstable, and savings deposit, though relatively stable, is of too high cost. And yet, the longest term for the savings deposit is set at three years.

Taiwan's level of interest rates has been higher than in most other countries, due to the scarcity of capital and the uninterrupted inflationary movement of prices in the past. Through various steps
taken by the government to stabilize the currency and encourage capital savings and investment, domestic savings gradually increased in recent years and the level of interest rates has also gradually come down.

It is desirable that the needed agricultural lending funds be secured from a capital market through the sale of bonds or debentures. However, the capital market in Taiwan which started operation recently is not so active for the moment to share the responsibility of agricultural financing. Consequently, the Central Bank of China assumes a positive role in giving rediscourts to the agricultural banks against discounts or loans they gave granted to farmers or farmers' organizations. It also entrusted the Bank of Taiwan with special functions to finance the loan programs of the government enterprises. The Central Bank was reactivated in July, 1961. Participation by the bank in agricultural financing is a progressive undertaking, through which the planning on agricultural credit can be tied into the monetary and financial programs of a national scope.

The counterpart fund is an important source for agricultural credit, providing funds to agricultural organizations for rural reconstruction and for relending to farmers for production. The Provincial Government provided the Land Bank of Taiwan with a sizable amount of funds to strengthen the lending capacity of the bank to meet the farmer's additional needs in connection with the "Land-to-the-Tiller" program. However, more important is the creation of an opportunity to build up capital by the credit institution through which they will become self-sustaining and independent of continual capital reserves.
by the credit sections of farmers' associations. Subscriptions of stocks in the credit section by farmer-borrowers are arranged under the Unified Agricultural Credit Program. Such an arrangement in addition to a savings campaign should be encouraged particularly to meet the situation that in January, 1963, the farmers have completed their payment of land price under the land reform program. 6

3. Education and publicity

Two agricultural colleges are conducting courses in agricultural economics including farm credit. Many credit men were selected from among the graduates of vocational agricultural schools—a total of 41 in Taiwan, 10 of whom are of the senior grade. In order to be a good field worker, the credit man must have a thorough knowledge of farm extension which is going on in his township, in addition to the knowledge and experience in credit business. Many capable credit men were found to be men in their 20's and 30's who are graduates of senior vocational schools and who have worked as extension men before assignment to the supervised credit programs. The administrative agency should be staffed with men with experience in banking, agriculture, economics, and accounting to complement each other so that all aspects of this specialized type of credit can be considered in their true light. In this respect, prior emphasis should be given to the training of well-qualified personnel. In order to achieve this goal, the agricultural credit banks, governmental agencies, and farmers' associations have

6Approximately NT$600 million per annum was paid for land price by the farmers during the course of 10 years under the "Land-to-the Tiller" program.
constantly conducted training sessions for their own personnel.

"Harvest," sponsored by JCRF, and "Farmers' Friend," published by the Provincial Farmers Association, are two popular farm journals subscribed to by farmers. JCRF also issues a weekly called "Newsreel" and "Rural Credit News" for individuals and organizations concerned. The Cooperative Bank of Taiwan publishes the "Cooperative Quarterly," an academic publication primarily dealing with principles and theories on agricultural cooperation. The daily radio broadcast of "Good Farm" is one of the most effective information and education media.

**Integrating Agricultural Credit with Existing Programs and Institutions**

Improvement of the agricultural credit system in Taiwan is being made in the form of reinforcing the existing credit institutions rather than reorganizing them. Instead of abolishing old and creating new institutions, all efforts are directed toward enhancing the lending of capital and improving the lending procedures of the existing banks and associations. Taiwan has been fortunate to have a large number of farmers' associations at the township level which have had many years of experience in serving the credit need of farmers. Operating on cooperative principles, these farmers' associations offer the members a variety of services in credit, marketing, supplying, warehousing, processing, and extension education. Their credit potential is being developed to become the foundation upon which a sound agricultural credit system of Taiwan will be based. The two agricultural banks, with their respective fields of responsibility clearly delineated, are expected to function as reliable channels from which institutional credit will be
streamed to reach the farmers through their cooperative associations. As the institutions gain more strength in shouldering the responsibility of financing agriculture and prove themselves to be more competent in extending credit to farmers, the government enterprises, no doubt, will come to realize that they benefit more from leaving the lending activities to credit people and concentrating their efforts on their own specified fields of business.

Such a gradual approach toward improvement prescribed no dramatic change in the system. However, technical problems such as encouragement of saving, simplification of loan procedures, and supervised credit services are expected to arise from time to time in the course of developing financial resources and improving credit services of banks and associations. Success will come in gradual steps as these problems are solved one by one. Much experience has been gained from the experimental programs on supervised credit and the expanded program on unified credit. It has become a common belief that, in order to build up a sound agricultural credit system and make it work, coordinated efforts should be made not only by the government and the banks but also by the farmers and their cooperative associations. An intelligent planning on the coordination of credit with agricultural extension education including application of new farming techniques, farm analysis, publicity, and training has demonstrated a great benefit from credit to agriculture in national development.

This chapter has described the general situation and improvements of agricultural credit in the past decade in Taiwan. The following
chapter will discuss a specific kind of loan which was used in an experimental project by the Land Bank of Taiwan. The author has personally participated in this project for several years assisting to set up its implementation, observing, and assisting in its progress, and at the close tabulating the results.
CHAPTER VII

EXPERIMENTAL PROJECT OF AGRICULTURAL

PRODUCTION LOAN IN KIND

During the period of five years from 1956 to 1961, the author worked at the Land Bank of Taiwan as a member of the Experimental Team of Agricultural Production Loan in Kind which carried out the experimental projects in Taipei and Yilan Hsiens. These areas were close to the headquarters of the bank. The bank realized fully that providing credit is only one of the ways by which underdeveloped areas may hasten the coming of improved living standards and promoted agricultural productivity.

Credit, to be "an instrument of progress" by getting needed capital to those who can make good use of it, requires suitable background conditions, in the absence of which it may be as sterile as seeds thrown on the dry sands of the desert. After all, credit is a good thing only if so productively used that it provides a surplus after interest and principal are paid out of which better living may be expected. Otherwise, it decreases the farmer's equity or it borders on charity which, though necessary at certain times and places, should not be confused with credit as an instrument of agricultural progress.

As Dr. Horance Belshaw pointed out, at best, agricultural credit has been static in the great majority of underdeveloped countries.¹

¹Belshaw, Horance, Agricultural Credit in Economically Underdeveloped Countries, 1959, op. cit., p. 230.
By this is meant that, at the end of the credit period, there has been no net increase in output, in the income of the peasant, or in his assets. Our general problem is to convert static into dynamic credit, by which is meant that at the end of the credit period there is an improvement in output and income or in assets.

By implication, this means that borrowers have to be able to demonstrate their ability to utilize loan funds in a useful and effective way before loans should be granted. The problem becomes one of qualitative lending so that those farmers who can demonstrate growth potential receive loans. This qualitative approach, however, means that a very large proportion of producers in Taiwan would not qualify for loans, because they would use their limited amount of loan in unproductive respects.

In order to show how every cent of a loan could be used productively, the Experimental Team of Agricultural Production Loan in Kind carried out the projects since 1957.

The Origin and Features of Agricultural Production Loan in Kind

This experimental project of the new method of an agricultural loan, Agricultural Production Loan in Kind, was approved by the Board of the Land Bank of Taiwan and started its experiment in July, 1957.

An experimental team was composed of 10 members who were recent graduates of agricultural colleges and headed by a high official of the bank who was the former professor of agricultural economics of Taiwan University. An amount of NT$10,000,000 was appropriated and set by the bank as the loan fund for this project.
The principal purpose of this project was to provide agricultural credits which were needed by farmers in suitable time. The farmers who borrowed money from the bank were helped and supervised by the bank to purchase the production goods.

The farmers, whether owners, part-owners, or tenants, were qualified to apply for these agricultural production loans in kind. The purpose of this experimental project had four questions to be testified: (1) Do farmers need the agricultural production loan in kind? (2) What kind of productive supplies were purchased by the farmers after they borrowed money? (3) Do farmers use the borrowed money for other purposes? (4) Do they repay the principal and interest of the loan timely as contracted?

According to the length of the term, the loans were classified in the following categories:

1. Two-year period--ox cart, draft cattle, hand cart, pump, seeds, nursery trees, barns, and hog-compost house.
2. One and a half-year period--dry ground (drying platform) and compost house.
3. One-year period--thresher, sprayer, sweet potato grater, small farm machines and tools, baby pigs, night soil house, and blower (fanning mill).
4. Six- to 12-month period--sow and feed.
5. Six-month period--insecticide, night soil, and repairing expenses of compost house.
The Procedures of the Loan

The procedures for the agricultural production loan in kind are as follows.

1. The bank published the general regulations about the loan. In order to suit different local situations, the team would discuss and study the feature of this loan with the agricultural extension agencies of local townships before the loan started.

2. The agricultural extension agency of the local township informed qualified farmers to apply for the loan. In some instances the qualified farmers applied directly to the bank, or the agricultural extension agency filled out the application forms and turned them in to the bank for the farmers.

3. The agricultural extension agency called the applicants together and conducted the meeting to which one or two members of the Experimental Team of the bank were assigned for guidance. In this meeting each applicant may select one to three items of production goods for the loan.

4. After the meeting the members of the team investigated the applicant's credit and ability and made comment on the application forms which were later on sent back to the agricultural extension agencies of the local township for reviewing. Finally the application was approved by the general manager of the bank.
5. The members of the team brought money to the local town and notified the approved applicants to sign the contract. The applicant had to have two other persons for co-signing to guarantee repayment. Then the applicant had one-half the amount of the loan first for ordering his needed goods and had the other half immediately after he got the goods which were checked by the members of the team.

6. The members of the team often tripped around the towns and villages to inspect and to the local agricultural extension agencies, which always helped the team to supervise the farmers for using the objects. If any farmer violated the regulations, the bank could cancel the contract at once and force the violator to repay the loan.

7. The borrower repaid the principal and interest of the loan by two installments annually. The first payment started the first harvest season after the date he borrowed the loan. The interest was at a single rate of 1.5 per cent monthly. (This was only the cost of using the principal of the loan. All other expenses of the project were paid by the bank. It could not be expected to be paid out of the interest which was charged to the farmers because it was an educational and experimental function, not purely a bank function.) Ten days before the date of repayment, the bank sent a card to the borrower to ask for repayment. The bank also asked the local agricultural extension agencies to help them in urging the
borrowers to repay the loan. On the date due the member of the team went to the towns and villages to collect the repayment. The borrowers who failed to repay the loan on the date due had to go to the head office of the bank in Taipei to repay it personally, or they sent the repayment by mail.

After all debts were cleared, the contract and other documents were returned to the borrower.

Two Typical Instances

There are many outstanding cases of which the farmers' income and living standard were improved due to the success of the project of the agricultural production loan in kind.

Here are two typical instances of how the loan was operated.

1. Mr. Wang, a Taipei Hsien farmer, had barely managed to support his family of eight from the 0.8 hectare of dry land which produced only sweet potatoes and other low-priced crops. After the loan was started in his area, he consulted with the members of the team and the agricultural extension agency of the township; then he obtained a loan of NT$5,000. With that money he dug a well, installed an electric pump, and used 0.3 hectare of his farm for growing vegetables. By fully utilizing the underground water and his abundant family labor, the farmer is growing different vegetables from season to season and is receiving a larger cash income with a quicker turnover.
When we first met this family—parents and six children—we observed how few and worn their clothes were; all suffered from malnutrition due to insufficient food and a diet almost limited to sweet potatoes plus a little rice and meat occasionally. They rarely smiled, but there was a certain hope evidenced by their determination to try new ways of farming their land.

Six months after he borrowed the loan when we again saw the family with improved general health, more adequate clothing, and a new attitude, we recalled our earlier observations. Analyzing them, we saw the almost immediate effect of assistance they had received. Through his larger income he was able to pay off the loan in full and continue on a self-sustaining basis. Now we saw the long-range and permanent benefits for this family of the agricultural production loan in kind.

2. Mr. Lin, a Yilan Hsien farmer, owned 0.5 hectare of paddy and 0.5 hectare of dry land from which he supported his family of 10. His paddy produced rice and the dry land produced sweet potatoes. There was enough rice to feed his family which was supplemented by sweet potatoes. But the family had a surplus of sweet potatoes which were sold at a very low price as usual. After consulting with the members of the team and the agricultural extension agency of the township, he borrowed NT$8,000 to buy pigs and some commercial
feed. Pigs were raised by women and children of his family and fed the surplus sweet potatoes. After one year he sold these hogs and earned a net profit of NT$10,000. His farm production was also increased by using the hogs' manures as fertilizer. Mr. Lin did not borrow money after this because he had his own fund which was enough to invest in hog production.

The above instances are only two of many successful instances in the operation of the agricultural production loan in kind.

Results of the Experimental Project

After completion of the experimental project, the questions set in the project were satisfactorily answered.

1. The agricultural production loan in kind was mostly welcomed by farmers. This could be proved by the following facts:

(a) A numerous number of farmers attended the loan meeting held at local townships. (b) Each applicant selected his own needed items very carefully and independently. No one had imitated the other's selection of items.

The livestock was the most preferred item by the farmers. The second was draft cattle. Others were cart, compost house, and thresher.

Once the author asked some applicants in the meeting why they did not want the loan for commercial fertilizer and irrigation facilities. They answered me that commercial fertilizers were already supplied by the Food Bureau and the
big scale of irrigation facilities was established by the Water Conservancy Bureau. The Water Conservancy Bureau had not taken care of the small scale irrigation facilities at that time so some farmers applied for loans to purchase pumps. By this we might conclude that almost all farmers applied for the loan which they really needed for their production.

2. Whether the agricultural production loan in kind succeeded or failed depended largely on whether the borrowers used the loans for production and were able to repay the principal and interest or not. The member of the team traveled around frequently to inspect and supervise the uses of the loan as soon as loans were granted. So far as the author knew, there was not a single one of more than 15,000 loans totalling NT$24 million extended to about 12,000 farmers in the experimental areas which violated the loan regulations. The repayments to the bank constituted almost 99.5 per cent during the project period. A few who lost their crops through natural hazards could not repay on time, but all loans were properly used in agricultural production and were paid back to the bank eventually. By this fact we may say that this kind of credit is dynamic, as Dr. Belshow called it, by which is meant that at the end of the credit period there was an improvement in production and income or in assets. It had benefited farmers.
This agricultural production loan in kind had been successfully carried out because of three characteristics: (a) to investigate the applicant's character, credit, and capability carefully before a loan was granted, (b) to inspect and supervise the uses of loan closely after the loan was granted, and (c) the full amount of the loan to be granted so that the borrowers could purchase the production goods they wanted. (Some kind of credit was granted only in a certain percentage of value of the supplies rather than the full amount needed. The partial amount of the loan is easier to be used for other purposes, such as for living expenses, as the borrowers were too poor and did not have enough money to add to the loan to buy the necessities they needed.)

The only disadvantage of this kind of a loan was to need more personnel to supervise the work, which increased the cost of the loan.

The agricultural production loan in kind has now been extended throughout the whole island because of its tremendous success in the experimental project carried out in the Taipei and Yilan areas.

This chapter has shown how, through the agricultural production loan in kind, the untapped resources of land production potential in quantity and quality were revealed. Backed by agricultural credit, farming, the greatest industry in Taiwan, rose to a new status and those who participated in the work to a new quality of citizenship.
The next chapter will discuss the suggested measures on agricultural credit in Taiwan.
CHAPTER VIII

SUGGESTED MEASURES ON AGRICULTURAL CREDIT

Agriculture has played an important role in the process of economic development in Taiwan. It will still be the same for further development. Agricultural credit is as important a factor to agriculture as is the blood circulation to man's body. Blood circulation keeps man alive, active, and healthy. The same is true that agricultural credit makes agriculture alive, active, and healthy. Without agricultural credit, agriculture will suffer from malnutrition, be anemic and unhealthy.

The importance of agricultural credit has been fully realized and many efforts were made in this respect. Taiwan has made some progress indeed in recent years. But there are still some deficits because of the features of agrarian structures in Taiwan. Among those which have had the most serious effects are the uneconomic size of farms, the concentration of holdings, the high interest rates on loans, indebtedness, and the lack of adequate credit for the small farmer. It is to alleviate the above that the following suggested measures may be adopted.

1. That the agricultural credit planning board which was composed of seven representatives from agencies concerned at the national and provincial level should be strengthened. It should act not only as a coordinator among agencies but also as a supervising and administering institution such as FCA in the United States.
2. In order to maintain the result of the "Land-to-the Tiller" program, the owner-farmers under the program are prohibited from mortgaging their land by law. The legislation should be revised to permit each institution to use real estate mortgages as security, especially for long-term loans.

3. That the government enterprises such as the Taiwan Sugar Corporation, the Food Bureau, the Tobacco and Wine Monopoly Bureau, and the Supply Bureau should not be lending agencies and should stop granting loans directly to their farmers. They might invest money to establish a specialized lending agency such as the Production Credit Corporation in the United States, or they might trust the existing agricultural credit institutions to finance their producers so that all agricultural credits will be operated through normal channels.

4. If the collecting system of the land tax revenue were to be changed from the cadastral to taxation on land value, the land tax revenue would increase three times. (It will be discussed in Chapter XI.) A portion of increased amount of land tax revenue may be used as a part fund of agricultural credit.

5. A portion of the export duties if recovered on commercial crops or an excise duty if levied on goods manufactured from agricultural raw materials, including forestry and fisheries, may provide a means to accumulate and build up domestic resources for the use of agricultural credit.
6. That provision be made for private credit and capital organizations to invest in the securities issued by agricultural credit banks and institutions in order to increase the operating capital of these institutions.

7. That subsidy be made by the government in the difference of interest rate between agricultural credit and other credits in order to attract capital flowing to rural areas.

8. That finance for short-term purposes should be found through the mobilization of local and national resources, but the funds required for reclamation of land, large-scale irrigation facilities, land improvement, and other agricultural developments requiring long-term capital must come largely from external sources.

9. That it is desirable that foreign capital have the same advantages and security as domestic capital, as a guarantee of the privilege of withdrawal of principal as well as earnings or convertibility into a growing flow of capital from abroad.

10. That an insurance system be established to help the borrowers who failed to repay the loans due to natural hazards to crops and plagues to livestock. Meanwhile, the reserve of insurance companies may be invested in bonds and stocks of agricultural credit institutions.

11. That organization of all kinds of cooperatives—production, marketing, or financial—be encouraged. The members of
these cooperatives have the advantages in borrowing and repaying loans collectively and supervising each other closely in uses of the loans which will decrease the cost of the loan.

12. That a subsidy combined with a loan will be necessary for submarginal farmers, i.e., those who are not considered good credit risks from the purely banking point of view.

The above 12 measures which are suggested for improving and strengthening the existing system of agricultural credit might be realized without too many difficulties if the government desires to do so.

But in Taiwan the greater part of the farmers are in the low-income group. These may be called marginal farmers who with unusual effort and perseverance finance themselves through regular credit institutions. They not only need credit service but also educational, extension, and social welfare services. Admittedly any kind of service on loans that benefits these farmers is expensive. It is the government's responsibility to help them temporarily and prepare them to get credit from regular credit institutions.

This is involved in policy matter which will be discussed further in Chapter XI.
CHAPTER IX

EVALUATION OF ECONOMIC DEVELOPMENT

Rate of Economic Growth

There are a number of economic indicators showing the various aspects of economic growth. Of these indicators, gross national product, national income, and per capita income are most closely related to economic growth.

1. Gross national product and economic growth

Gross national product at current prices rose from NT$10,315 million in 1951 to NT$59,929 million in 1960, an increase of NT$49,614 million or a growth rate of 21.42 per cent on the average annually during the 10-year period of 1951 to 1961. This obviously reflects the combined influence on the market value of output of both greatly increased physical volume and higher price. After taking into account the factor of price change, gross national product in 1960 as measured at 1952 constant prices amounted to NT$27,876 million. The annual rate of increase in real gross national product is 7.8 during the 1951 to 1961 period. This is indicative of the continuing upward trend of Taiwan's economic growth during recent years (see Table 10).

2. National income and per capita income

National income or net national product at current factor cost rose from NT$8,942 million in 1951 to NT$48,003 million in 1960, or an increase at an annual average rate of 21.1 per cent. After allowance is made for the influence of price change, real national income in
Table 10. Changes of Gross National Product in Taiwan 1951-1961

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount (million NT$)</th>
<th>Fixed base index (1952=100)</th>
<th>Link index (previous year=100)</th>
<th>Amount (million NT$)</th>
<th>Fixed base index (1952=100)</th>
<th>Link index (previous year=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951</td>
<td>10,815</td>
<td>68.68</td>
<td>---</td>
<td>14,015</td>
<td>89.02</td>
<td>---</td>
</tr>
<tr>
<td>1952</td>
<td>15,747</td>
<td>100.00</td>
<td>145.60</td>
<td>15,747</td>
<td>100.00</td>
<td>112.33</td>
</tr>
<tr>
<td>1953</td>
<td>21,200</td>
<td>134.63</td>
<td>134.63</td>
<td>17,434</td>
<td>110.71</td>
<td>110.71</td>
</tr>
<tr>
<td>1954</td>
<td>23,154</td>
<td>147.04</td>
<td>109.22</td>
<td>18,896</td>
<td>120.00</td>
<td>108.39</td>
</tr>
<tr>
<td>1955</td>
<td>27,885</td>
<td>177.08</td>
<td>120.43</td>
<td>20,314</td>
<td>129.00</td>
<td>107.50</td>
</tr>
<tr>
<td>1956</td>
<td>32,297</td>
<td>205.10</td>
<td>115.82</td>
<td>21,129</td>
<td>134.18</td>
<td>104.01</td>
</tr>
<tr>
<td>1957</td>
<td>37,986</td>
<td>244.23</td>
<td>117.61</td>
<td>22,596</td>
<td>148.49</td>
<td>106.94</td>
</tr>
<tr>
<td>1958</td>
<td>41,650</td>
<td>264.49</td>
<td>109.65</td>
<td>24,074</td>
<td>152.88</td>
<td>106.54</td>
</tr>
<tr>
<td>1959</td>
<td>48,675</td>
<td>309.11</td>
<td>116.87</td>
<td>25,864</td>
<td>164.25</td>
<td>107.44</td>
</tr>
<tr>
<td>1960</td>
<td>59,929</td>
<td>380.57</td>
<td>123.12</td>
<td>27,876</td>
<td>177.02</td>
<td>107.78</td>
</tr>
</tbody>
</table>


Taiwan has been increased by 85.3 per cent at an annual average rate of 7.7 in the 10 years from 1951 to 1961 (see Table 11).

Table 11. Change of National Income in Taiwan 1951-1961

<table>
<thead>
<tr>
<th>Year</th>
<th>National income at current prices</th>
<th>National income at 1952 constant prices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount (million NT$)</td>
<td>Fixed base index (1952=100)</td>
</tr>
<tr>
<td>------</td>
<td>----------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>1951</td>
<td>8,942</td>
<td>68.5</td>
</tr>
<tr>
<td>1952</td>
<td>13,047</td>
<td>100.0</td>
</tr>
<tr>
<td>1953</td>
<td>17,882</td>
<td>137.1</td>
</tr>
<tr>
<td>1954</td>
<td>18,807</td>
<td>144.1</td>
</tr>
<tr>
<td>1955</td>
<td>22,561</td>
<td>172.9</td>
</tr>
<tr>
<td>1956</td>
<td>26,041</td>
<td>199.6</td>
</tr>
<tr>
<td>1957</td>
<td>29,982</td>
<td>229.8</td>
</tr>
<tr>
<td>1958</td>
<td>32,827</td>
<td>251.6</td>
</tr>
<tr>
<td>1959</td>
<td>38,513</td>
<td>295.2</td>
</tr>
<tr>
<td>1960</td>
<td>48,008</td>
<td>368.0</td>
</tr>
</tbody>
</table>

Source of data: Same as Table 10.
Per capita income at current prices increased from NT$1,063 in 1951 to NT$4,237 in 1960. With allowance made for price change, per capita income in 1960 at 1952 constant prices was 41.9 per cent over 1951. The annual increasing rate of real per capita income was 4.2 per cent during the 10-year period from 1951 to 1961. Or it may be said that in the 1951-1961 period Taiwan experienced an annual economic growth of 7.7 per cent or, if the factor of population growth (at 35/1,000 rate) is accounted for, 4.2 per cent (see Table 12).

Table 12. Changes of Income Per Capita in Taiwan 1951-1960

<table>
<thead>
<tr>
<th>Year</th>
<th>Per capita income at current prices</th>
<th>Per capita income at 1952 prices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount (NT$)</td>
<td>Fixed base index (1952=100)</td>
</tr>
<tr>
<td>1951</td>
<td>1,063</td>
<td>70.6</td>
</tr>
<tr>
<td>1952</td>
<td>1,505</td>
<td>100.0</td>
</tr>
<tr>
<td>1953</td>
<td>1,993</td>
<td>132.4</td>
</tr>
<tr>
<td>1954</td>
<td>2,024</td>
<td>134.5</td>
</tr>
<tr>
<td>1955</td>
<td>2,334</td>
<td>155.1</td>
</tr>
<tr>
<td>1956</td>
<td>2,609</td>
<td>173.4</td>
</tr>
<tr>
<td>1957</td>
<td>2,915</td>
<td>193.7</td>
</tr>
<tr>
<td>1958</td>
<td>3,087</td>
<td>205.1</td>
</tr>
<tr>
<td>1959</td>
<td>3,508</td>
<td>233.1</td>
</tr>
<tr>
<td>1960</td>
<td>4,237</td>
<td>281.5</td>
</tr>
</tbody>
</table>

Source of data: Same as Table 10.

Changing Pattern of the Economy

In addition to economic growth indicators discussed in the preceding section, there are other criteria which may be used in judging a country's economic progress. Generally speaking, the more developed a country is, the smaller the proportion of its population will be engaged
in agriculture and the smaller its agricultural share in national income. Economic progress is also reflected by changes in the composition of exports and imports. In exports, the weight carried by agricultural and processed agricultural products would tend to fall while that carried by manufactured goods would tend to rise. In imports, the share of capital goods and raw materials would tend to go up while that of consumer goods would tend to go down. On the basis of these criteria, the economic progress of Taiwan during the past decade can be seen from Table 13 below.

Table 13. Changing Pattern of Taiwan's Economy

<table>
<thead>
<tr>
<th>Period</th>
<th>Total</th>
<th>Agriculture</th>
<th>Industry</th>
<th>Commerce</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sources of net domestic product</td>
<td>1951</td>
<td>100.0</td>
<td>33.8</td>
<td>24.9</td>
<td>13.0</td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>100.0</td>
<td>28.9</td>
<td>27.9</td>
<td>16.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period</th>
<th>Total</th>
<th>Agriculture</th>
<th>Industry</th>
<th>Commerce</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Distribution of employment</td>
<td>1951</td>
<td>100.0</td>
<td>62.8</td>
<td>7.8</td>
<td>10.7</td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>100.0</td>
<td>56.1</td>
<td>11.3</td>
<td>11.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period</th>
<th>Total</th>
<th>Agriculture</th>
<th>Industry</th>
<th>Commerce</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Exports</td>
<td>1951</td>
<td>100.0</td>
<td>22.8</td>
<td>67.5</td>
<td>9.2</td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>100.0</td>
<td>11.8</td>
<td>55.8</td>
<td>30.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period</th>
<th>Total</th>
<th>Capital</th>
<th>Raw</th>
<th>Consumer</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Imports</td>
<td>1951</td>
<td>100.0</td>
<td>13.0</td>
<td>45.0</td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>100.0</td>
<td>27.2</td>
<td>47.0</td>
</tr>
</tbody>
</table>

Source of data: 1. DGBAS; 2. Taiwan Provincial Department of Civil Affairs; 3 and 4. Bank of Taiwan.
It is clear from the above table that the weight of agriculture in the over-all economy has been on the decline while that of industry has been on the increase. This trend is clearly discernible whether viewed from sources of net domestic product, from distribution of employment, or from exports. However, the weight of agriculture continues to be greater than that of industry. In other words, after a decade of economic development, Taiwan is still not able to change this basic fact and its economy remains predominantly agricultural. The progress Taiwan has made is great but not so great as to enable it to transform the agricultural economy to a modern, industrial economy.

A Comparison with Other Countries

Has Taiwan's economic growth been rapid or slow? To answer this question, it is necessary to compare its statistics with the records of growth of other countries in the same period. However, some caution must be exercised in making this kind of comparison: (1) Owing to differences in methods of compilation and components of statistics, it can be expected only to discern some general trends rather than to reach accurate conclusions. (2) Statistics used for present comparisons are collected from different sources and have been reprocessed to facilitate comparison, thus incurring the risk of departure from the intentions of the original compilers. (3) Taiwan could not have achieved the present rate of economic growth without the inflow of United States aid amounting to approximately U.S. $100 million per year. In the following table (Table 14), eight countries which are believed to be representative are selected for comparison.
### Table 14. Economic Growth Indicators for Different Countries
(At Constant Prices As Indicated in Source Data)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>National</td>
<td>Consump-</td>
<td></td>
<td>Capital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gross</td>
<td>tion as % of</td>
<td></td>
<td>formation as % of</td>
<td>Net savings as % of</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>income</td>
<td>disposable</td>
<td></td>
<td>disposable</td>
<td>disposable national</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>income</td>
<td>income</td>
<td></td>
<td>income</td>
<td>income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taiwan</td>
<td>7.1</td>
<td>7.1</td>
<td>3.5</td>
<td>8.8</td>
<td>6.5</td>
<td>1.4</td>
<td>84.3</td>
</tr>
<tr>
<td>Japan</td>
<td>9.4</td>
<td>9.2</td>
<td>7.9</td>
<td>9.3</td>
<td>9.3</td>
<td>9.8</td>
<td>71.7</td>
</tr>
<tr>
<td>India</td>
<td>---</td>
<td>2.4</td>
<td>1.0</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Ceylon</td>
<td>2.2</td>
<td>1.5</td>
<td>-1.0</td>
<td>3.2</td>
<td>2.0</td>
<td>---</td>
<td>88.6</td>
</tr>
<tr>
<td>Holland</td>
<td>5.4</td>
<td>6.5</td>
<td>5.2</td>
<td>4.6</td>
<td>10.3</td>
<td>9.5</td>
<td>75.4</td>
</tr>
<tr>
<td>West Germany</td>
<td>6.9</td>
<td>7.3</td>
<td>6.1</td>
<td>6.7</td>
<td>7.9</td>
<td>11.4</td>
<td>75.2</td>
</tr>
<tr>
<td>Italy</td>
<td>5.7</td>
<td>5.8</td>
<td>5.2</td>
<td>4.3</td>
<td>8.0</td>
<td>18.4</td>
<td>79.4</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2.0</td>
<td>2.6</td>
<td>-0.03</td>
<td>2.4</td>
<td>0.2</td>
<td>-2.8</td>
<td>82.5</td>
</tr>
<tr>
<td>Canada</td>
<td>2.9</td>
<td>---</td>
<td>-0.2</td>
<td>3.7</td>
<td>2.2</td>
<td>-2.5</td>
<td>75.5</td>
</tr>
</tbody>
</table>

Among those selected, three are from Asia, four from Europe, and one from America. The three Asian countries consist of one advanced, one underdeveloped with a large area and population, and one underdeveloped of small size. The four European countries are the United Kingdom, an advanced country; West Germany, a country rebuilt from the rubbles of war; Holland, comparable to Taiwan in land area and population; and Italy, a relatively less advanced country in Europe. The one American country is Canada, a developing country with a large area and abundant resources. All of these eight countries are actively engaged in the development of their economics. Because of incomplete data, comparisons will be made only of the period from 1952 through 1958.

In terms of national income, Japan's rate of growth of 9.2 per cent ranks first on the list, followed by West Germany's 7.3 per cent. Taiwan's rate of 7.1 per cent ranks third. However, in terms of per capita income, which is by far the most significant indicator of a country's economic potential and its living standard, Taiwan's growth rate of 3.5 per cent is less than half of Japan's 7.9 per cent, West Germany's growth rate of 6.1 per cent, and Holland's and Italy's 5.2 per cent. While the percentage gap might not appear too big, the lag in absolute amount is very great. This is because Taiwan's economic base is very small when compared with that of advanced countries, such as Japan and West Germany. In terms of percentage, an increase from 10 to 20 is the same as an increase from 100 to 200. But in absolute terms it is quite different. In other words, Taiwan's growth actually
lags much more behind that of the advanced countries than a limited comparison would seem to indicate. If such trends should continue, its economic development would forever be lagging behind.

The rate of capital formation and the rate of savings are also indicators of economic development. Take, for instance, the ratio of gross capital formation to disposable income. Except for India for which data are incomplete, Taiwan has the second lowest ratio--15.7 per cent--next only to that of Ceylon. Japan's 28.3 per cent again tops the list. Canada, West Germany, Netherlands, and Italy are all above 20 per cent.

The rate of net savings reaches 23.6 per cent in Japan, 22.6 per cent in West Germany, 24.6 per cent in Netherlands, 13.9 per cent in Canada, 13.3 per cent in Italy, and 10.3 per cent in the United Kingdom. In Taiwan, this rate is as low as 6.2 per cent. Thus, judging by these two ratios both of which have a decisive effect on economic growth, Taiwan is again far behind others, especially Japan and West Germany, the two fastest growing countries after World War II.

The Theory of Rostow's Stage of Economic Development

In the autumn of 1958 Professor Walt Whitman Rostow delivered a series of lectures at Cambridge on "an economic historian's way of envisaging the sweep of modern history." These lectures have been

1Professor of Economic History, Massachusetts Institute of Technology.
published by the Cambridge University Press.2 As the economist also prepared an abridged version of his thesis.3 As soon as the theory of Rostow's stage of economic development was being introduced into Taiwan, it immediately became an interesting and controversial subject to the people in Taiwan. They come naturally to the question: What stage has Taiwan arrived at in its drive for economic development? If it is still in the backward stage, how backward is it? If it is in the advanced state, how far is the advance? This is, of course, a very difficult question to answer. To help us understand this question, the theory of Rostow's stage of economic development is summarized below first. Rostow envisaged the sweep of modern history as a set of "stages of growth" and placed all societies within one of five economic categories.

1. The traditional society

A traditional society is one whose structure is developed within limited production functions, based on pre-Newtonian science and technology, and on pre-Newtonian attitudes toward the physical world. Professor Rostow used the Newtonian age as a symbol for that watershed in history when men widely came to believe that the external world was subject to a few knowable laws, and was systematically capable of productive manipulation.

The traditional societies are not static. Their story has been one of endless change. But the central fact about the traditional

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society was that a ceiling existed on the level of attainable output per capita. This ceiling resulted from the fact that the potentialities which flow from modern science and technology were either not available or not regularly and systematically applied. Generally speaking, these societies, because of the limitation on productivity, had to devote a very high proportion of their resources to agriculture which usually absorbed 75 per cent or more of the working force; and from this primacy of agriculture there followed in turn a hierarchical social structure with little scope for vertical mobility. Income above minimum consumption levels was largely spent in nonproductive or low-productive outlays--religious feasts and ceremonies, monuments, wars, and high living for the land-owning minority. Family and clan connections played a large role. Political power tended to lie in the various regions rather than in the capital; the landowners in any case usually maintained great influence over such central political power as existed.

In terms of history then with the phrase "traditional society," Rostow is grouping the whole pre-Newtonian world: the dynasties in China, the civilization of the Middle East and the Mediterranean, and the world of medieval Europe. And to them Professor Rostow added the post-Newtonian societies which, for a time, remained untouched or unmoved by man's new capability for regularly manipulating his environment to his economic advantage.

2. The transitional society

The second stage of growth embraces societies in the process of transition; that is, the period when the preconditions for take-off are
developed; for it takes time to transform a traditional society in the ways necessary for it to exploit the fruits of modern science, to fend off diminishing returns, and thus to enjoy the blessings and choices opened by the march of compound interest.

The idea spreads not merely that economic progress is possible, but that economic progress is a necessary condition for some other purpose, judged to be good: be it national dignity, private profit, general welfare, or a better life for the children. Education, for some at least, broadens and changes to suit the needs of modern economic activity. New types of enterprising men come forward—in the private economy, in government, or both—willing to mobilize savings and to take risks in pursuit of profit or modernization. Capital formation is not merely a matter of maximizing profit; it is a matter of a society’s effective attitudes towards science, applied science, and risk-taking as well as the adaptability of the working force. But all this activity proceeds at a limited pace within an economy and a society still mainly characterized by traditional low-productivity methods, by the old social structure and values, and by the regionally based political institutions that developed in conjunction with them.

The preconditions for take-off were initially developed, in a clearly marked way, in Western Europe of the late seventeenth and early eighteenth centuries, as the insights of modern science began to be translated into new production functions in both agriculture and industry, in a setting given dynamism by the lateral expansion of world markets and the international competition for them. But all that lies
behind the breakup of the Middle Ages is relevant to the creation of the preconditions for take-off in Western Europe. Among the Western European states, Britain, favored by geography, natural resources, trading possibilities, and social and political structure, was the first to develop fully the preconditions for take-off.

3. The take-off

The third stage of growth, the take-off, is the great watershed in the life of modern societies. This is a rather short stage of development, usually lasting two to three decades. During this period economic and social development has become an automatic and self-sustained process, and the economy is developing at a normal rate of growth. Three conditions must be fulfilled in order to achieve a take-off: (a) a decisive shift in the rate of productive investment from about 5 per cent of national income to 10 per cent or more; (b) the development of one or more substantial manufacturing sectors, with a high rate of growth; (c) the existence of a political, social, and institutional framework that makes use of the impetus of the modern sectors as well as the potential external economies produced by the take-off so that economic growth becomes self-sustained.

The third condition implies that this framework should have a considerable capacity to mobilize capital from domestic sources and to raise the marginal rate of savings (i.e., an increasing proportion of incremental income goes to saving). The internal supply of finance for the take-off usually comes from two sources: (a) From shifts in the control over income flows. For example, the state taxes away the income
of landlords and uses it for economic development, or the more enter-
prising former landlords invest in commerce and industry. (b) From the
ploughing back of profits in particular rapidly expanding sectors. How-
ever, as a precondition for take-off, the demand for capital may be more
decisive than the supply of capital (i.e., there should have been one or
two rapidly growing sectors which can profitably utilize capital).

The take-off is often initiated by some leading sectors. Such
sectors grow very rapidly and set in motion the various expansionary
forces of the economy. There is no definite answer as to what these
leading sectors should be. Historically, it was cotton textiles for
Britain, timber for Sweden, meat and dairy products for Denmark, and
silk for Japan. In addition, export industry, import-substituting indus-
try, railway, and even enlargement and modernization of armed forces
also played the role of leading sector in other instances. There is,
clearly, no one pattern or sequence for the take-off.

Professor Rostow did approximately allocate the take-off of
Britain to the two decades after 1783; France and the United States
to the several decades preceding 1860; Germany, the third quarter of
the nineteenth century; Japan, the fourth quarter of the nineteenth
century; Russia and Canada the quarter century or so preceding 1914;
while during the 1950's India and Communist China have, in quite differ-
ent ways, launched their respective take-offs.

4. The drive to maturity

According to Professor Rostow, some 60 years after take-off
begins (say, 40 years after the end of take-off) what may be called
maturity is generally attained. The economy, focused during the take-off around a relatively narrow complex of industry and technology, has extended its range into more refined and technologically often more complex processes; for example, there may be a shift in focus from the coal, iron, and heavy engineering industries of the railway phase to machine-tools, chemicals, and electrical equipment. This, for example, was the transition through which Germany, Britain, France, and the United States had passed by the end of the nineteenth century or shortly thereafter.

In this stage some 10 to 20 per cent of the national income is steadily invested, permitting output regularly to outstrip the increase in population. By the end of take-off real annual income may lie, in current American dollars, anywhere from $150 per capita to $300; by the end of the drive to maturity anywhere from $400 to $600.

5. The age of high consumption

As societies achieved maturity in the twentieth century, two things happened: real income per capita rose to a point where a large number of persons gained a command over consumption which transcended basic food, shelter, and the structure of the working force; change in ways which increased not only the proportion of urban to total population but also the proportion of the population working in offices or in skilled factory jobs--aware of and anxious to acquire the consumption fruits of a mature economy.

In America, the "Progressive Era" from 1901 to 1916 brought a shift of social objectives rather than a drastic reallocation of
STAGES OF ECONOMIC GROWTH

In Selected Countries

- Take-off
- Maturity
- High mass consumption

Note that Canada and Australia reached maturity before high mass consumption.

Source: The Economist, August 15, 1959, p. 413

Figure IV. Stages of economic growth
resources. By 1916 the United States had accepted the most revolutionary of all forms of economic policy, the progressive income tax; it had created a climate in which big business curbed itself or was, to a degree, curbed; the trade unions were explicitly given the right to organize; a federal reserve banking system had been created, partly to exercise a degree of control over the trade cycle. The public interest also won new recognition in the policy of conservation, national parks, and reservations.

For the United States the turning point was, perhaps, Henry Ford's moving assembly line of 1913-1914; but it was in the 1920's and again in the postwar decade, 1946-1956, that this stage of growth was pressed to, virtually, its logical conclusion. In the 1950's Western Europe and Japan appear to have fully entered this phase, accounting substantially for a momentum in their economies quite unexpected in the immediate postwar years. The Soviet Union is technically ready for this stage and, by every sign, its citizens hunger for it; but Communist leaders face difficult political and social problems of adjustment if this stage is launched.

What Stage Does Taiwan Have Now?

Professor Rostow envisaged the sweep of modern history as a set of "stages of growth" and placed all societies within one of five economic categories: the traditional society, the transitional society, the society in the crucial process of take-off, the maturing society, and finally the society of high mass consumption. While Rostow's thesis is still open to argument, his classification of economic growth into
five stages does afford a convenient yardstick for our present purpose.

In a developing process such as Taiwan, the most important stage is obviously the take-off stage. Rostow compares the transformation of a backward economy to a modernized economy with the take-off of a plane. In the development of a backward economy, taking off is the most difficult and the most important job. Once the economy takes off, it will generate automatic forces to enable it to drive to maturity and to reach the stage of high mass consumption.

After reviewing the current economic situation of Taiwan and Rostow's stages of economic growth, we may say that Taiwan has more or less passed the stage of transition and is ready for take-off. The question now is whether it has already taken off or not. To answer this question, let us analyze its situation in terms of Rostow's conditions for take-off.

1. The rate of net investment at 10 per cent or more

The ratio of Taiwan's net capital formation to national income averaged 14.4 per cent a year between 1951 and 1961. This is more than sufficient to fulfill Rostow's condition on investment rate. However, this rate of 14.4 per cent is made possible only because of the large inflow of external capital in the form of United States economic aid; its own net savings amounted to only 6.3 per cent of the national income. Even if all these savings were diverted to productive purposes, the rate would still be far short of the 10 per cent criterion.

2. One or more substantial manufacturing sectors

While Rostow did not elaborate on the term "substantial," it is evident that it should be substantial enough to stimulate the emergence
and expansion of other modern sectors and produce external economies to facilitate the growth sectors. In addition, this substantial manufacturing sector(s) must have a high rate of growth. In this regard, although Taiwan does have several comparatively large manufacturing industries, such as sugar, textiles, and cement, none of them appear to be substantial or have a high rate of growth. Taiwan's industrial development has actually been a development of factories. Once a factory or factories were built, they stayed there and never developed into a substantial sector capable of leading the economy to self-sustained growth.

3. A political, social, and institutional framework with a considerable capacity to mobilize domestic capital.

Obviously Taiwan has not yet fulfilled this condition. Taking into account the fact that Taiwan's net savings amount to only 6.3 percent of national income and that profitable investment opportunities are becoming less and less, it would have a better perspective of where it actually stands.

From the above examination of Taiwan's economic development in recent years, we may say that the economy of Taiwan has roughly passed the transitional stage and is more or less ready for a take-off. In other words, it may be considered as having reached the pretake-off stage from which it should be rather easy to move into the next stage. If Taiwan would adopt appropriate measures to expedite the process, it can be fairly sure that its economy will take off within the next few years. As it labored long and hard in preparing for the take-off, its
economy should proceed on in a self-sustained manner once it has taken off.

The Taiwan economy has already passed the developmental stage and is ready for a take-off. Taiwan has a well-developed industrial and agricultural base, a well-organized transportation network, high potentiality for exportation of heavy-electric products, fairly large natural resources, and good social order. All of these are the prerequisites necessary for further economic development. In the first instance, it would be easy for the economic plan to be implemented for a 15-year period through the government's role in economic planning and the help of modern technology. The speed of development may achieve the following:

<table>
<thead>
<tr>
<th>Year</th>
<th>1960</th>
<th>1965</th>
<th>1970</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>95,000</td>
<td>111,130</td>
<td>130,0</td>
</tr>
<tr>
<td>GDP per head</td>
<td>4,129</td>
<td>7,560</td>
<td>9,</td>
</tr>
<tr>
<td>Population</td>
<td>10,727</td>
<td>11,928</td>
<td></td>
</tr>
</tbody>
</table>

The estimates above are based on the National Accounts Statistics of Taiwan, published by the DSAI, China, January, 1961, for 1960, and estimated according to assuming growth rate.

In making the projection above, we assume that the national economy will continue to grow at an average annual rate of 10 per cent.
CHAPTER X

PROSPECTS FOR FURTHER DEVELOPMENT

As mentioned earlier, the economy of Taiwan has already passed the transitional stage and is ready for a take-off. Taiwan has a well-developed agriculture, a well-organized transportation network, high potentiality for generating of hydroelectric power, fairly large manufacturing industries, widespread education, and good social order. All these are the precious elements necessary for further economic development. Once the economy takes off, it would be easy for them to attain a certain target projected for a 10-year period through the 1960's. Indeed, with correct economic policy and the help of modern technology, the speed of development may achieve the following projection (Table 15).

Table 15. Projection of Taiwan's Economic Growth 1960-1971

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>1960</th>
<th>1970</th>
<th>Assuming growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>National income</td>
<td>million</td>
<td>48,008</td>
<td>111,120</td>
<td>10.0</td>
</tr>
<tr>
<td>Per capita income</td>
<td>$</td>
<td>4,237</td>
<td>7,560</td>
<td>7.3</td>
</tr>
<tr>
<td>Population</td>
<td>1,000 persons</td>
<td>10,792</td>
<td>14,709</td>
<td>2.7</td>
</tr>
</tbody>
</table>

Source of data: For 1960, based on the National Accounts Statistics published by the DGBAS, China, January, 1961; for 1970, calculated according to assuming growth rate.

In making the projection above, we assume that the national income of Taiwan will increase at an average annual rate of 10 per cent for the 1960's. We further assume that its population will grow at 2.7
per cent per year as against the past record of 3.5 per cent per year. Because of this projected decline in population growth, the rate of increase of per capita income will be 7.3 per cent per year instead of 4.4 per cent as in the past. In 1970 per capita income is expected to reach NT$7,560 (or U.S. $189 equivalent). While this projection may appear to be moderate, its realization will require very great efforts. They have experienced in the first and second economic development planning period from 1952 to 1960 that the economic growth rate in terms of national income and of per capital income was only 8 per cent and 4.4 per cent, respectively. Actually, the rate of increase of national income and that of per capita income in the late years of the 1950's have shown a tendency to slow down.\(^1\) Thus in 1957, for example, they were only 6.7 per cent and 3.5 per cent, respectively. In 1958, they dropped even further to 5.6 per cent and 2.2 per cent, respectively. Although some small gain was witnessed in 1955, they were still less than the average of the 1950's. It is, therefore, clear that to increase the average rates to 10 per cent and 7.3 per cent is not easy to achieve. The situation might be improved immediately as soon as Taiwan starts to enter the "take-off" stage.

In order to achieve the projection of economic growth for the year 1970, every effort should be made by the government and the people cooperatively.

Some policies which are suggested to facilitate attaining the desired goal will be more completely discussed in the next chapter.

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\(^1\)See Tables 11 and 12.
CHAPTER XI

POLICY SUGGESTIONS

As stated earlier, Taiwan is limited in natural resources. The rate of population growth is high. The rate of domestic net savings is low, and the United States economic aid is gradually decreased. These are the hindrances on the path for its further economic development, although Taiwan has achieved some degree of economic development during the past decade. In order to pass over those hindrances and to go further in economic development, Taiwan has to work hard. And the correct policies are the most important factors essential to attain the goal.

Policy of Balanced Growth

In developing their economics, underdeveloped countries generally make the mistake of neglecting the importance of agriculture and over-emphasizing industrialization as a means for quick development. The theory ruled out lopsided development for the developing countries. It insists that a harmonious relationship is necessary in the process of economic development. However, this carries no necessary implication that all industries must grow at the same rate but emphasizes rather that growth among sectors of the economy must be correlated. Recent examples show the results of such systematic discrimination against agriculture in two communist countries. East Germany in the post World War II period invested all its limited capital in industry which provided a few jobs, and most of the population was forced to return to
farms without much capital. The result was declining agricultural production and an increase in food prices. Another example came out of Communist China and resulted from the movement of "Great Leap Forward" in 1958. In this case also an extreme emphasis on industry left the country unnecessarily subject to panic and severe food shortage.

On the other hand, without industrialization there may be a great lack of job opportunities (in industry) for rural people released from lands. People in the developing countries are usually attached to the land, and agriculture suffers because of lack of industrial advancement.

In the author's opinion, Taiwan should always observe the principle of balanced growth in agriculture and industry. The industrialization will advance technology and bring the "spread effects" in agriculture; the agriculture will supply its raw materials and part of savings for industrialization. Therefore, agriculture and industry are complementary to each other in the process of economic development in Taiwan. As for the development with industry, selection of a few "take-off" industries probably is the best way to develop its industry so that the bottlenecks in resource supplies could be avoided.

Population Policy

The population problem was a central and critical problem in economies before Malthus first presented his theory. The problem arises in somewhat different forms in connection with growth theory for developing countries. Malthus did not analyze the effects of population growth
on economic development. Modern economists are also split on the matter of whether or not population growth contributes to economic development. The difficulty is that the population growth is different in different countries. What is the right size of population for a country? There is not much hope of getting a precise answer to this question, Also this is not primarily an economic question. A country may prefer to have a smaller population than the economic capacity to burden it because of the alleged advantages of being a small nation, the compactness of the people, easier national unity, and freedom from external political responsibilities; or because it dislikes the processes by which population is enlarged—immigration or having large numbers of children. Or alternatively it may be desired to have a population larger than the economic capacity to burden it because of its value in defense or in aggression; or of a desire to play a big part in world affairs; or because of a desire to accommodate immigrants, especially if they are refugees from religious or political persecution; or because of a liking for the company of other people in general, or of large numbers of children in particular. But confining ourselves to economic aspects, the population size should be related in ratio to its resources and the level of technology.

The population problem in Taiwan is more serious than that for many other countries because of the following reasons: (1) The natural rate of population growth of Taiwan is twice as high as the world
average.\(^1\) If the fertility rate is held at the prevailing level, then there will be a population of 21 million by the end of 1980.\(^2\)

(3) The land reclamation index is up near 25 per cent and there are few lands that remain uncultivated.\(^3\) (4) The gap between the rate of population growth and increase in food production is narrowed. (5) For political reasons, refugees from the China mainland and overseas Chinese from the Southeast Asian countries will continue to migrate to this island.\(^4\) Certainly these threats are of sufficient importance to support the need of a firm and clear population policy in Taiwan. Time is pressuring. Even if population control were possible and instituted immediately, results would not show far from 10 to 20 years. It took 30 years for Japan to decrease its birth rates from 35 per 1,000 in 1920-1924 to 18.2 per 1,000 in 1955-1958.\(^5\)

It is rather difficult to suggest what size of population and what rate of population growth are best suited to Taiwan. But it is rather easy to present some facts and figures to show how its rapid population increase affects adversely the economic growth. Let's assume

\(^1\)The world average of population increase was 1.6 per cent in 1957 while for Taiwan it was 3.3 per cent in the same year. See UN Population Report, No. 31, op. cit., and China Yearbook, 1958.


\(^3\)Chen, C. S., Land Utilization of Taiwan, 1950, op. cit., p. 61.

\(^4\)The numbers of such refugees are not available, but it is estimated at least several thousand moved into the island each year since 1955.

\(^5\)UN, Population Report, No. 31, op. cit.
first that the capital-output ratio for Taiwan would be 3 to 1, meaning that a three-dollar investment is needed to generate a one-dollar income. This is to say that a three-dollar saving (whichever source) is needed for investment in order to generate that one-dollar income. During the past decade, the population was growing at 35 per 1,000 per year on the average. Maintaining the present per capita income alone would require an annual increase of 3.5 per cent in national income. To make this possible, savings would have to be pushed up to 10.5 per cent. If we want a 2 per cent increase in per capita income, national income and savings would then have to go up to 5.5 per cent and 16.5 per cent, respectively. However, its average annual savings between 1952 and 1960 amounted to only 6.3 per cent. If this rate as well as the 3.5 per cent population growth rate should continue, its savings would not be sufficient even to maintain the present level of per capita income, let alone an increase. On the other hand, if Taiwan's population growth could come down to 1.5 per cent per year (this is a relatively normal rate), the picture would be very different. Maintaining the present level of per capita income would then call for a savings rate of only 4.5 per cent, which is well within its present ability. In fact, with an actual savings rate at 6.3 per cent, it could raise its per capita income by more than 0.5 per cent. The effect of population growth is great on the growth of economy.

Policy of Capital Formation

Importance of capital formation in economic development has been commonly recognized by all developing countries. This would be a serious
problem when the domestic saving is insufficient and the foreign economic aid is eventually ceased. The domestic savings are the normal and dependable source for capital formation in economic development. The main interest of this section is how to increase capital formation. Suggestions will be made in terms of voluntary and compulsory savings.

1. Voluntary savings

Voluntary savings are the chief source of capital formation. They are that part of goods or services produced which is set aside for further production.

Theoretically, savings are closely related to the level of per capita income. The higher the per capita income, the greater the volume of savings, other things being equal. However, the small amount of savings in Taiwan is not entirely due to the fact that people's income is low but also because they do not have saving habits. Several evidences support this fact. One is a large amount of "uncommitted capital" in the Taiwan monetary market. Another is that Taiwan people hoard gold, foreign currency, and foreign stocks. Still another is

6"Uncommitted capital" is that capital neither invested in production nor government bonds, deposited in banks or invested in business stock. It is merely provided for short-term loans which are usually on a daily or weekly basis. Most of this kind of capital is used for speculative purposes. It was estimated about NT$3 billion in Taipei alone at the end of 1960. See Central Daily News, January 16, 1961.

7The government had to sell 2,000 ounces of gold in the open market each week to meet the demand for gold since 1955. Foreign bonds and stocks are also traded in the black market in Taipei.
that prices of urban lands rose more than 20 times in the last decade. Evidently this was the result of capital poured into real estate and other unproductive investments in Taiwan. 8

Measures that could be desirable for the increase of investment and saving in Taiwan are: (1) improvement of stock and bonds market so that industrialists can obtain the needed capital at lower cost through the open market, (2) provide more incentives to smaller savers by removing inflationary pressures and providing more security to savers, and (3) promotion of insurance policies such as simplified life insurance policies.

2. Compulsory savings

Compulsory savings can be obtained either by inflation (or budget deficit financing) or by taxation. 9 Inflation is a self-defeating device because it may undermine the developing programs by channeling savings into unproductive forms and encouraging the mass propensity to consume. Furthermore, inflation financing has become a habit in a number of developing countries. Taxation as an instrument to finance economic development has several drawbacks which are usually made in terms of (1) the effects on incentive to provide voluntary savings, (2) leading

8Hsiao, T., Urban Land Reform in Taiwan, Land Reform, Vol. 25, No. 6, 1960, Taipei, Taiwan, China.

9There are other forms of compulsory savings without inflation or taxation, i.e., to confiscate either civilian property or foreigners and to persuade or force people to work on them without payment. Those methods may be efficient in communist countries or newly independent countries with nationalism, but neither could be done in Taiwan.
people to reduce their savings or actually to dissaving, (3) impeding
the incentive to work. However, experiences in Japan and Soviet Russia
during their early economic development are good examples to demonstrate
that taxation is an efficient way to accelerate capital formation in
the developing countries.

The Japanese experience is more attractive to the developing
countries. She remained isolated from the outside world and received
very little external financial aid for her earlier economic development.
Of course, Japanese people are indoctrinated with the virtues of thrift
and austerity; landlords invested their earnings from agriculture into
industries; wages were kept low; and trade unions were forbidden. Yet
much work should be credited to the public financial policy through
taxation and forced loans. The device of land tax in Japan during the
1870's allowed the government to exploit the increased productivity in
agriculture. The stiff land taxation constituted 85.6 per cent of the
total government tax revenue from 1888 to 1892, and it still held as
high as 55.8 per cent from 1903 to 1907.10 Could this Japanese experi-
ence serve as an example to Taiwan? This will be discussed in more
detail.

Before we discuss the possibility of using land taxation as an
instrument of compulsory savings in Taiwan, we should know the com-
positions of the total government revenue in Taiwan. More than 70
per cent of the total government revenue in Taiwan is from indirect

10 Liu, Weiping, An Economic Analysis of Taiwanese Agricultural
taxes (Table 16). Income taxes, both personal and corporation, constitute only about 10 per cent of the total government revenue. Monopoly profits, custom tax, and defense surtax are the main props of Taiwan government revenue.

Table 16. The Composition of Taiwan Government Total Revenue 1952-1957

<table>
<thead>
<tr>
<th>Year</th>
<th>Income tax</th>
<th>Property tax</th>
<th>Land tax</th>
<th>Commodity tax</th>
<th>Monopoly profits</th>
<th>Defense surtax</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1952</td>
<td>12.8</td>
<td>16.4</td>
<td>5.6</td>
<td>4.4</td>
<td>20.9</td>
<td>10.7</td>
<td>17.7</td>
</tr>
<tr>
<td>1953</td>
<td>11.2</td>
<td>6.6</td>
<td>7.9</td>
<td>5.4</td>
<td>17.2</td>
<td>13.6</td>
<td>18.4</td>
</tr>
<tr>
<td>1954</td>
<td>10.3</td>
<td>5.1</td>
<td>6.2</td>
<td>9.4</td>
<td>14.7</td>
<td>16.9</td>
<td>16.8</td>
</tr>
<tr>
<td>1955</td>
<td>12.9</td>
<td>5.2</td>
<td>5.1</td>
<td>9.6</td>
<td>14.6</td>
<td>15.7</td>
<td>18.2</td>
</tr>
<tr>
<td>1956</td>
<td>8.1</td>
<td>5.9</td>
<td>6.9</td>
<td>10.2</td>
<td>14.2</td>
<td>14.0</td>
<td>17.0</td>
</tr>
<tr>
<td>1957</td>
<td>7.3</td>
<td>6.6</td>
<td>6.7</td>
<td>10.2</td>
<td>17.1</td>
<td>14.1</td>
<td>18.0</td>
</tr>
</tbody>
</table>

Sources of data: "The Review and Improvement of the Tax System in Taiwan," The Economic Reference, No. 177, June 16, 1959, Ministry of Economic Affairs, Taipei, Taiwan, China.

Land taxes paid by Taiwan farmers or landlords are low relative to the productivity of lands. The average tax payment for each hectare of land in 1958 was NT$380 (approximate to U.S. $10), while average yields per hectare of production for paddy lands was about NT$14,000 and for upland about NT$4,500 in 1958. Thus, land taxes were only about 3 per cent of the total production.

A discussion of how much land taxation revenue could be increased under the proposed collecting method is of interest. The existing land tax collection is using the cadastral land tax system. The tax yields
could be increased substantially if the collecting system were changed to taxation on land value. The land tax revenue will be increased three times if such changes are made. Table 17 shows the comparisons of land tax yields between these two collecting systems.

Objections will certainly arise under the proposed collecting system because the burden on the Taiwan farmers will be increased. Once more, look at Japan.

In the initial stage of its development, agriculture was heavily taxed and, in contrast, manufacturing industries were lightly taxed or even subsidized. A method which was effective in Japan might be as effective in Taiwan. Of course, the complementary measures, the increase of land taxes in urban areas, should be also launched at the same time.

Table 17. Comparisons of Land Tax Yields Under Different Systems of Collection in Taiwan in 1958

<table>
<thead>
<tr>
<th></th>
<th>Paddy Land</th>
<th>Upland</th>
<th>Total</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadastral a</td>
<td>206</td>
<td>122</td>
<td>328</td>
<td></td>
</tr>
<tr>
<td>Land value tax b</td>
<td>900</td>
<td>158</td>
<td>1,058</td>
<td>322</td>
</tr>
</tbody>
</table>

a Actual collection in 1958.
b The average price per hectare of paddy land was about NT$130,000 and for upland the price was NT$45,000 per hectare. There are about 500,000 hectares of paddy land and 350,000 of upland. Figures shown in the tables show 1 per cent of the total land value.

Agricultural Policies

Agricultural policies should be made both to increase the production efficiency of agriculture and to maintain harmonious relationship between agriculture and other sectors in the economy.

Several directions are suggested for Taiwan's agriculture in the course of its economic development which are briefly discussed as follows.

1. Selection of the most efficient crops

Sugar cane, the cash crop, and rice, the main food crop, are the two main crops and compete with each other in Taiwan.

Professor C. S. Chen has pointed out that the sugar production is not the most efficient industry in Taiwan according to agricultural geography. In consideration of China as a whole, he suggested that the sugar production industry should be transferred to Hainan Island, which is the most ideal place for production of sugar cane. At the present time Hainan Island is under the Chinese communists' rule, but sugar is still the number one exported item of international trade to Taiwan. It is, of course, unwise to change drastically in the production of sugar cane. But the relative importance of the sugar industry is declining in Taiwan. The existing prices are lower than that of the directly competitive crops, so that there is a decrease in land resource from less to more efficient uses. The government should pay more attention to the study and research of costs and prices of production of their

11Chen, C. S., Land Utilization of Taiwan, Taiwan University Press, 1950, p. 156.
competitive crops and determine the acreage of land for rice, sugar cane, and other favorable crop selections in order to use its limited land most efficiently and most profitably.

2. Increase of land saving and import substituting crops

As the population increases, the labor force in agriculture will presumably be about proportionately increased. Such added labor should be directed into production of land saving and labor intensive crops such as vegetables and fruits.

On the other hand, Taiwan spends about U.S. $50 million each year to import agricultural commodities, mostly cotton, soybeans, and wheat. Increased production of such commodities would save scarce foreign exchange and reduce dependence on imports.

3. Improvement of the livestock industry

Livestock raising is still a sideline for Taiwan's farmers, and there are no specialized livestock farms as yet. The reason for this is the feed problem. Land is too scarce in Taiwan to be used for grass or forage. Livestock production in Taiwan is, therefore, concentrated on hog raising. Cattle or buffalos are raised as draft animals and seldom merely for milk and meat. There were 6 million hogs produced in 1960, and 2.8 million of them were slaughtered for domestic consumption or for export. The total value of the marketed hogs was NT$3.5 billion in 1960, which was second only to rice production in value.\(^{12}\)

Expanding production of livestock, particularly hogs, should be favorably

\(^{12}\text{Central Daily News, March 9, 1961, Taipei, Taiwan, China.}\)
considered because: (a) it provides high quality protein and fat, (b) hogs can often be taken care of by women and children, (c) they produce manure that supplements the insufficient volume of chemical fertilizers, and (d) the demand for pork is high both domestically and internationally.

4. Investment should be concentrated on short-run projects.

Taiwan's major development problems are its growing population and its scarcity of capital. Capital must, therefore, be used with utmost efficiency and additional investment made on projects that can generate the highest profits in the shortest period. Long-run problems can be more safely left to take care of themselves than can the more pressing problems of the immediate present.

If investment funds were concentrated on the short-run projects such as (a) development of underground water and (b) increased production of fertilizers, insecticides, and fungicides, and breeding new seeds, there would result a greater impact on economic development and production.

5. Farm income stabilization

Suggestions to stabilize farm incomes in Taiwan include programs to improve marketing practices, farm price stabilization, and crop insurance. All these programs can be carried out by farmers themselves or through government aid.

6. Agricultural credit and extension services

Agricultural credit is an essential instrument to carry out the agricultural policies successfully. Or we may say that agricultural credit policy is one part of agricultural policies. Each agricultural
policy suggested above needs capital to carry out. But in Taiwan the farms are small and the farmer's income and educational level are low, which are disadvantages to agricultural development. To overcome these disadvantages, a good policy and a sound system of agricultural credit are most helpful.

So far Taiwan does not have an agricultural credit act. It is of urgent importance to legislate an act through which all measures concerning agricultural credit have the same rules to follow.

Because of the features of agriculture in Taiwan, the supervised agricultural credit system seems best suitable. Cost of supervision is one of the principal factors limiting the general provision of supervised agricultural credit. However, it should be understood that this goal is the progressive improvement of the borrower, and that the directly financed supervision should be a temporary expedient.

The objective of supervised credit is to increase agricultural production and to improve the level of rural living. The government-supported agricultural extension service provides for disseminating information and demonstrating the latest technical developments of experiment station research. It will be wise to combine loan supervision and extension activities within the scope of the program of supervised agricultural credit. There is considerable support for such an integrated arrangement. One immediate advantage is to conserve a limited supply of trained personnel. In addition to developing farm plans and servicing agricultural loans, supervisors can carry on extensive educational programs for the benefit of many farmers in their districts.
Another advantage is the reduced cost of the program in terms of number of people served.

The supervised credit programs are usually started by governments as an emergency measure to take care of a temporary supervised credit into a higher level. It is to prepare farmers to get credit from regular agricultural or commercial banks usually within a period of several years.

If the government launches a program of supervised credit combined with educational, welfare, and social development in rural communities in order to improve the condition of its lower income farmers, then supervision may be regarded as a means of facilitating the accomplishment of that objective. When the economic and social gains to the community outweigh the additional cost of the service, the government may be justified in providing a subsidy.

The feature of the agricultural production loan in kind which is being extended in Taiwan may be compared with that of supervised agricultural credit in the United States. Although it has been achieved in some measure, the desired goal has still not been strong enough to accelerate the agricultural development to the highest possibility.

In the United States the Farmers Home Administration handles the government-supervised lending program. It is considered a very sound system of supervised agricultural credit which has proven its worth as the stimulus for agricultural development to reach the highest goal. With minor changes, it might be adapted in Taiwan.
Selection of "Take-Off" Industries

A developing country with a limited amount of capital, a lack of skilled labor, and a low level of technology should select one or a few industries to be "take-off" industries instead of spreading its investments among too many kinds of industries. Such "take-off" industries should generate potential economic forces that should lead other sectors in the economy. The textile industry was the "take-off" industry in England early in the nineteenth century. The silk industry of Japan and the lumber industry of Sweden played important roles in early stages of economic development. A "take-off" industry should be selected on the basis of the following conditions: (1) A large proportion of the raw material needed should be from domestic sources; (2) the industry should have potential to generate "external economies"; and (3) the demand for the products produced should not be vulnerable to substitutes.

The sugar industry is now the leading one in Taiwan but it cannot be the "take-off" industry because of certain inherent market problems. The textile industry has grown more rapidly in recent years than other industries, and international outlets in the United States of America and southeastern Asian countries might be hopeful. Raw materials, however, would in Taiwan be a problem. Also the developing countries in Asia have been investing in their own textile industries which are easily established. The further expansion of Taiwan's textile industry would, therefore, face insurmountable marketing problems.
At the end of 1961 the Industrial Development and Investment Center of the Republic of China and the United States AID mission to China invited four staff members of the Stanford Research Institute to study the opportunities of investment and industrial development. The team spent two full months to realize the natural and manpower resources, analyze the existing industrial pattern, and suggest some industrial opportunities which appeared to be feasible for Taiwan.¹³


This list of industries, according to their estimated beneficial effects upon the Taiwan economy, provides a basis for long-range planning for industrial development.

Among these 14 industries, the following list of six seems most suitable as the industries selected for "take-off." However, it is valuable for further study.

1. Chemicals--natural gas
2. Chemicals--petroleum
3. Plastics, resins, and synthetic fibres
4. Electronics
5. Watches and clocks
6. Optical products
CHAPTER XII

CONCLUSIONS

This study is a macroanalysis of economic development in Taiwan during the 1950's. The major source of information is aggregative second data which were obtained from the Chinese publications.

Taiwan's economy is still primarily agricultural even though it has been experiencing a rapid development of industry since 1950; more than 50 per cent of the population still derives its livelihood from agriculture. The agricultural industry supplies not only foodstuffs and raw materials but also provides almost 70 per cent of the total foreign exchange from exports of agricultural commodities. A Chinese proverb says: "Public prosperity is like a tree. Agriculture is its roots; industry and commerce are the branches. If the roots suffer, the branches break, the leaves fall, and the tree dies." The success or failure of agricultural development will, therefore, affect greatly the economic development and progress in general.

Agricultural credit is an essential instrument for agricultural development; especially is this true under the unfavorable conditions of the limitation of agricultural land and the growing population on this small island. The limitation of land resource supply could be relieved by increasing land productivity as a result of additional fertilizer and irrigation service and of new machineries, techniques, seeds, and insecticides being used. Therefore, it can be said that the expansion of agricultural output in Taiwan must be accomplished by the
substitution of capital for land resource. That means the more and better agricultural credit, the more and better agricultural production. So a sound system of agricultural credit is the most helpful for the greatest economic development. The results of the experimental agricultural loan program point to practical ways to improve farm credit.

The main object of economic development they struggle for presently is to improve the agricultural industry and channel this increased productivity into industrialization. They are looking for one or a few promising export industries and concentrate investment on them as leader in the "take-off," so that their equipment, scale of operation, skills, quality, and cost can measure up to international standards and their products can compete in the international market on a long-term basis. This will then stimulate the development and modernization of other sectors and impart a forward momentum to the growth of the entire economy.

Taiwan maintains relatively large armed forces which constitute 20 per cent of the total gainfully occupied population, and the military burden is 60 per cent of the annual national budget. The tasks of the Chinese government at Taiwan are twofold. One is the struggle for political freedom from Communist domination and aggression, and the other is the struggle for economic freedom from poverty and starvation. These difficulties, together with its limited natural resources and the present weak political positions, make it more difficult to carry out the desired economic development.
The economic development of Taiwan, as many western economists see it, is on the verge of "take-off" and may become a self-propelled and self-sustained economic entity. The distance at which the verge of "take-off" enters into the stage of "take-off" and where reliance upon foreign aid turns to self-propelled and self-sustained economy is not so far, but this distance is most difficult to walk through. Anyway, where there is a will, there is a way. Whether it will succeed or fail is determined by the people themselves of Taiwan.

It is the author's high hope and firm conviction that the people of Taiwan will do their best to reach the economic targets set before them.
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