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Lee,Teng-hui

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STATISTICAL TABLES, METHODOLOGY, DATA SOURCES AND CONCLUSIONS REGARDING INTERSECTORAL CAPITAL FLOWS IN THE ECONOMIC DEVELOPMENT OF TAIWAN 1895-1960

By Teng-hui Lee

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Department of Agricultural Economics, Cornell University

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The analysis for this paper was carried out at Cornell University as part of a USAID financed contract for research on agricultural prices. We are grateful to USAID for its assistance.

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Chapter 1

Introduction
By John W. Mellor

This portion of T. H. lee's work on the Taiwan economy has been done as part of a Cornell University-USAID research contract on the "role of agricultural prices in economic development." Agricultural prices serve three major functions in the development process. They affect the allocation of resources to and within agriculture and hence the level of agricultural production, they influence the distribution of income among sectors of the economy and among income strata of the population, and, related to the income distribution function, they influence capital transfers from one sector of the economy to another. In performing their function of influencing capital transfers from one sector to another, agricultural prices interact with other transfer mechanisms, such as taxes and direct investment. Much has been written on the subject of intersectoral capital transfers in early stages of economic development and the interaction of these processes with the development of the agricultural sector. Unfortunately, there has been little empirical work on this subject.

The economy of Taiwan offers an unusual opportunity for study of these processes. Taiwan represents a successful case of economic development, not only with respect to the development of the non-agricultural sector, but also with respect to the development of a strong agricultural sector which has experienced rapid growth in production through major processes of technological change. Thus, Taiwan represents an ideal case for viewing intersectoral capital flows as they relate to agricultural development In addition, the Taiwan economy has made varying use over time of several devices for transferring capital from the agricultural to the non-agricultural sector, thereby providing opportunity to observe the varying play of these different devices Most important, a solid body of data are available for the period 1911-1960, allowing a detailed set of social income accounts to be constructed for that period For the period 1895-1911, sufficient data are available to allow analysis of the earliest period of accelerated economic development in Taiwan.

A careful study of intersectoral capital flows in the Taiwan economy required research by a person with an intimate grasp of the available data, experience in the handling of that data and knowledgeable concerning its imperfections, flaws, and needs for modification. Dr. T. H. Lee has brought to this job an intimate acquaintance with Taiwan and the various development efforts and a long period of scholarly research, both during his tenure as chief of the Agricultural Economics section of the Taiwan Provincial Department of Agriculture and Forrestry and during his period subsequent to 1957 as the economist for the Chinese-American Joint Commission on Rural Reconstruction. The large number of papers he has authored and co-authored include "An Analytical Review of Agricultural Development in Taiwan Input-Output and Productivity Approach," "Irrigation Investment in Taiwan," and "Agricultural Development and its Contribution to Economic Growth in Taiwan." In addition, many of the statistical series which he has used in this work were compiled by himself or under his direction, giving a special authority to his work with these data.

In this publication, Dr. Lee presents in Chapter 1 his conceptualization of intersectoral capital flows from the point of view of agriculture-non-agriculture sectoral relationships. The basic problem, of course, is to conceptualize the means by which a basically consumer goods producing industry such as agriculture can contribute to the processes of capital formation in the non-agricultural sectors of the economy. Following this presentation of the conceptual framework, Dr. Lee presents, in Chapter 2, the social accounting system which he has used for developing the statistical data on intersectoral flows in the Taiwan economy and states the sources of data and their limitations for this analysis. This is followed in Chapter 2 by the social accounting system which he has used for developing the statistical data on intersectoral flows in the Taiwan economy and states the sources of data and their limitations for this analysis This is followed in Chapter 3 by presentation of the major statistical findings regarding the intersectoral flows. In Chapter 4, an analysis is presented which draws not only from the data presented in this paper but from other work of Dr. Lee's with respect to his conclusions concerning the intersectoral relationships in the economy of Taiwan, the implications of these to agricultural development itself and the lessons which may be drawn of relevance to other countries. Finally, a statistical appendix is included which provides the basic data developed. The large amount of statistical data presented in this appendix, representing the product of an extraordinary amount of effort and insight, should be of great value to other scholars wishing to pursue study of these complex interrelationships between agriculture and other sectors in the Taiwan economy.

As indicated above, the portion of this research published here was done under the auspices of the United States Agency for International Development under a contract to Cornell University. We are grateful for the assistance of USAID and, in particular, to the Rural Development Office, Agriculture & Rural Development Service, Office of the War on Hungar, Agency for International Development, Department of State and to Douglas Caton and Norman Ward for their assistance.

Chapter 2

The Concept of Intersectoral Capital Flows

The concept of the measurement of intersectoral capital flows has been treated from many different angles including net savings flow, agricultural surplus, and transfer of capital.[1] Such conceptual differences are due, first, to the different definitions of the agricultural sector, second, to the lack of distinction between financial and physical aspects of capital flow and lack of recognition of the relationship between the balance of income account and changes in capital account, and, third, to the difficulty of identifying the process of the transformation of agricultural goods into capital goods in the course of economic development.

The scope of the agricultural sector has been defined in such ways as the rural area, agricultural production, and the farm sector. According to the scope of the different definitions, the nature and magnitude of the role of agriculture in the economic development will be changed. In this study, we define agriculture as a unified unit of the agricultural production sector and the agricultural household sector (including landless farm labor). Noncultivating landlords, business traders, money lenders, and nonagricultural activity unit in rural areas are excluded from our definition of the agricultural sector. A more detailed explanation of this treatment will be given in Chapter 3.

To estimate the magnitudes of capital flows and the relation between capital and income in economic transformations between agriculture and nonagriculture, an accounting definition of capital will be developed on the basis of agriculture's social income account. In this way we will first derive a statistical scale for measuring the direction and amount of capital flows between agriculture and nonagriculture.

In Chapter 4 we will present the statistical findings, which are derived from the social income account of Taiwan's agriculture. Through the statistical observation of intersectoral capital flows in Taiwan's agriculture, we will draw some implications and provide some suggestions for further analyses of the factors influencing the growth of agricultural production, of the process of agricultural surplus transfer, and of the financial aspect of capital outflow.

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1. The following classification of the concepts of intersectoral capital flows will be made from literature of economic development:
   a. net savings -- K. Ohkawa, B. F. Johnston
   b. agricultural surplus -- R. Nurkse, John F. C. Fei, Gustav Ranis, S. Ishikawa
   c. capital transfer -- ECAFE, UN, K. Ohkawa.

Conceptual Framework for Intersectoral Capital Flows

To prepare the conceptual framework and statistical method for this study, it may be helpful to present the sectoral interrelationship between agriculture and nonagriculture by a diagram. In this diagram, the whole national economy of Taiwan is divided into six sectors:[1] agricultural production, agricultural household, nonagricultural production, nonagricultural household, government, and foreign trade.

Figure 1 represents the flow chart of commodities and income between sectors. In the agricultural production sector, services of primary production factors such as land and labor flow from the agricultural household in the amount of, Pa, and produces output, Ya. The agricultural production sector consumes production goods such as chemical fertilizer, feeds, and other materials manufactured in the nonagricultural production sector to the amount of R_n^a. Agricultural products used in the agricultural production are provided from the gross agricultural output within a sector. The net agricultural output is partially consumed by the agricultural household sector to the amount C_a^a. The remaining amount of net output is sold to the nonagricultural production sector as raw materials, R_a^n, to the nonagricultural household sector for consumption, C_a^n, and directly to exports, E_a. Total selling quantity of agricultural products amounts to the sum of $R_a^n + C_a^n + E_a$. In nonagricultural production, total output is divided into two products, consumer goods and capital goods. Consumer goods flow from the nonagricultural production sector to the nonagricultural household sector, C_n^n, to the agricultural household sector, C_n^a, to the government sector, Cg, and to exports En. Capital goods are distributed to the agricultural production sector as the production goods to the amount of R_n^a, as the capital goods for investment, I_a, and for investment in its own sector, In. No capital goods export is assumed in this case. The government sector collect tax g_a from the agricultural household sector and g_n from the nonagricultural household sector and allocate it for consumption of industrial goods, C_n^g, and for savings to the amount Sg. In the foreign trade sector, the government exports agricultural products, Ea, and industrial consumer goods, En, for exchange of consumer goods, Mc, and capital goods, MI. The balance of international trade is shown as F.

Income generation can be seen by tracing in the opposite direction the commodity flows between sectors. Besides the commodity transaction between sectors, income also flows from the agricultural household sector to the nonagricultural sector in the form of government taxes and payment of land rent and interest. The agricultural household also receives income from the nonagricultural household sector.

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1. In this study, we define the first two as the agricultural sector.

Figure 1. Intersectoral commodity and income flow chart for Taiwan's economy

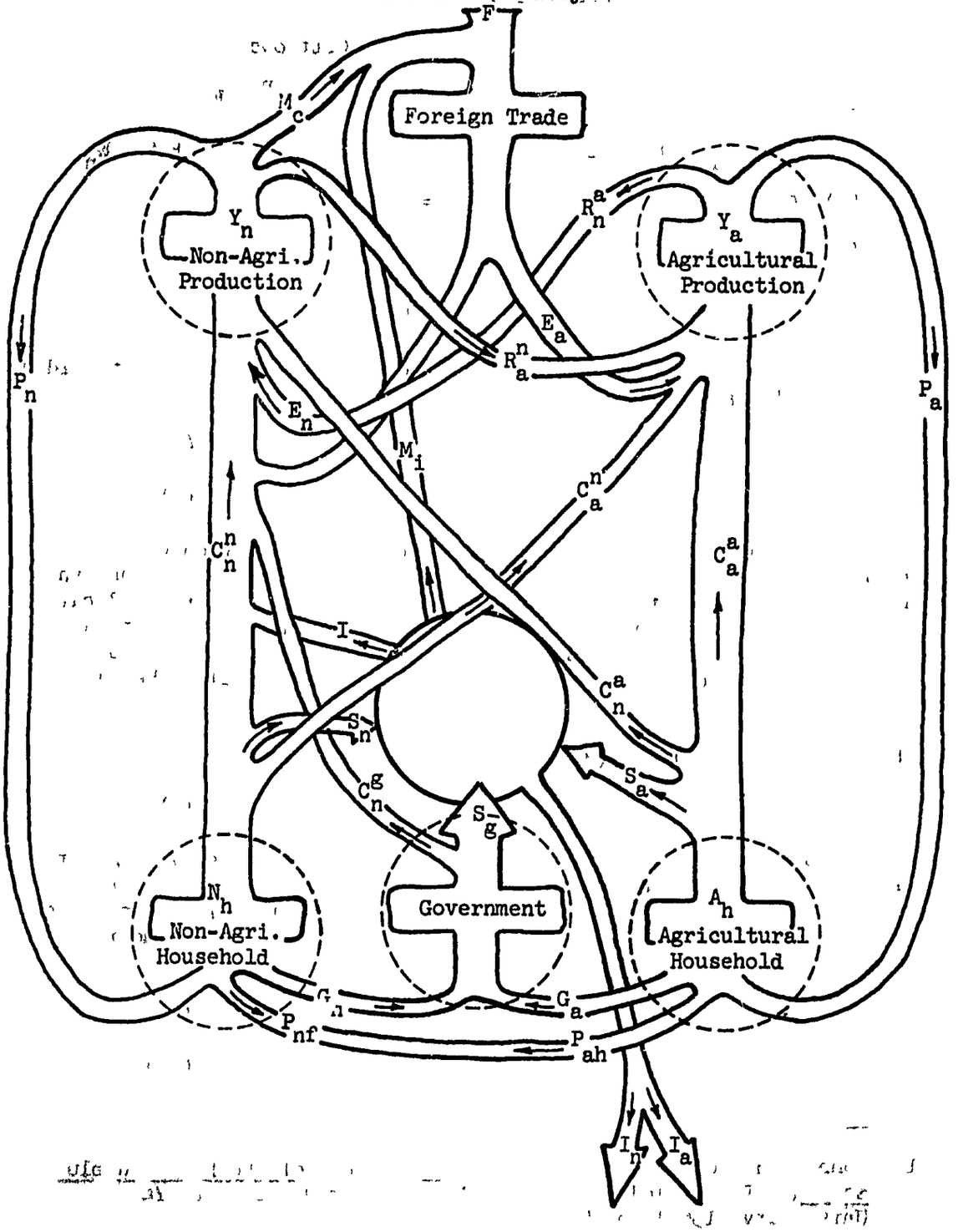

Figure 1 constructed by commodity and income flows can be summarized in the following accounting equations:[1]

	Inflows		Outflows
(1)	$P_a + R_n^a$		$= C_a^a + C_a^n + R_a^n + E_a$
(2)	$P_n + R_a^n + M_c + M_I$		$= C_n^n + C_n^a + C_n^g + R_n^a + I + E_n$
(3)	$C_a^a + C_n^a + S_a + g_a$		$= P_a$
(4)	$C_a^n + Cn + S_n + g_n$		$= P_n$
(5)	$C_n^g + S_g$		$= g_a + g_n$

Adding the five equations and cancelling out similar terms on both sides of the resulting equality, we have

$$Sa + Sn + Sg = I + (Ea + En) - (Mc + MI) \qquad (6)$$

$$\text{or} \quad I_n = (S_a - Ia) + Sn + Sg + F \qquad (7)$$

where $I = Ia + In$, and $F = (Fa + En) - (Mc + MI)$. Equation (6) is the financing equation indicating the relationship between savings and investment for the national economy as a whole. Equation (7) indicates the sectoral interdependence. The investment in the nonagricultural sector depends upon the amount of net capital flow from agriculture, size of savings in its own and government sectors, and also the import surplus.

Adding equations (1) and (3) for the agricultural sector, we have.

$$Sa = C_a^n + R_a^n + E_a - C_n^a - R_n^a - g_a \qquad (8)$$

As government taxing on agriculture is not generally made by commodity, the term ga in the equation (8) may be better included in the term Sa, from equation (8) and the term (Sa-Ia) in equation (7), then we can draw the following three cases, indicating the balance of commodity flows between agriculture and nonagriculture.

$$C_a^n + R_a^n + E_a - C_n^a - R_n^a \gtrless I_a \qquad (9)$$

$$\text{or} \quad C_a^n + R_a^n + E_a - C_n^a - R_n^a - I_a = B \qquad (9')$$

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1. John C. H. Fei and Gustav Ranis, Development of the Labor Surplus Economy, Theory and Policy (The Economic Growth Center, Yale University, 1964), p. 57.

The left terms of equation (9') indicate the commodity transactions between two sectors, and the term B is the balance showing the physical aspect of capital outflow from agriculture. The term B is also the balance of capital accounting between two sectors, which was not presented in Figure 1. Generally speaking, it is more effective and common to set up both capital and current operating (income) accounts in order to investigate the sectoral commodity and financial transactions. Capital account shows the changes in assets and liabilities. The increase in assets or the decrease in liabilities indicates the outflows of capital. The decrease in assets or the increase in liabilities indicates the inflow of capital. Therefore, the term B can be expressed as follows:

$$B = R + K \qquad (10)$$

The term R on the right side is the balance of current financial transaction between sectors, including the net payments of land rent, wages and interest, and government taxing and subsidies. The term K is the balance of the capital account between sectors, including the net changes in outstanding short-term and long-term loans and investment.

The above exposition on the accounting system of sectors interdependence between agriculture and nonagriculture is based on commodity and income flows in Figure 1, and the sectoral capital accounting. The important fact is that both of the above sectoral accounts of income and capital are related to the accounts of income, consumption, and savings-investment in the agricultural sector or the nonagricultural sector. This means that the above sectoral accounts can be derived statistically from the social income accounts including income, consumption and savings-investment in a sector. When we construct the social income account for the agricultural sector, the sectoral accounts can be systematically derived from it. The practical problems of construction of social income account will be explained in detail in Appendix A.

The equations (9') and (10) are generally valued at current prices of commodities and services in the transactions. The effects of changes of price ratio or sectoral terms of trade on sectoral capital flows are not reflected in equations (9') and (10). The term B in the equations, therefore, should be adjusted by the change of price ratio. The equation (9') in real terms thus can be expressed.

$$(C_a^n + R_a^n + E_a)/Pa - (C_n^a + R_n^a + I_a)/Pn = B' \qquad (11)$$

where Pa and Pn are price indices from agricultural products and nonagricultural products bought by the agricultural sector. When capital flows out from the agricultural sector, the term B' can be expressed:

$$B' = B/Pa + (C_n^a + R_n^a + I_a)/Pn\ (Pn/Pa - 1) \qquad (12)$$

The first term on the right side of the equation is the financial amount of capital outflow from agriculture in real terms, and second term is the amount of capital outflow caused by the change in the sectoral terms of trade between agriculture and nonagriculture. We call the former the visible net real capital outflow and the latter the invisible net real capital outflow.

From the above exposition on the statistical method for measuring the intersectoral capital flows, it becomes clear that the equations (11) and (12) are the most inclusive and effective ones for our study. The statistical estimate based on equations (11), (12) and the social income account of the Taiwan agriculture is summarized in Chapter 4 of the text. In order to make the statistical procedure clear, we have to mention the relationship between the discussion in Chapter 4 and the equations (9'), (10), (11) and (12). The left side of equation (9') is used for measuring the gross outflow of agricultural products and gross inflow of nonagricultural commodities in terms of current price, which correspond with the items (4), (5), and (6) in Table 2. The right side of equation (10) corresponds with the gross outflow of funds, (7), and gross inflow of funds, (8), and their balance or net outflow of funds, (9), in the same table.

In equation (11), the left side corresponds with item (13) in the table to indicate the net real capital outflow from the agricultural sector. The right side of equation (12) corresponds with items (10), (11), and (12) in the same table. The first item of the right side indicates the visible net real capital outflow and the second the invisible net real capital outflow, as mentioned above.

Before concluding this section, additional remarks on the concept of intersectoral capital flows from economic point of view should be made. The process of intersectoral capital flows has been made clear by the exposition of the above accounting system and diagram . But the economic meaning of the above accounting system with respect to the transformation of agricultural goods to capital goods has not yet been satisfactorily explained.

We assume that the economy is closed to international trade. Then, the expansion of capital goods in the economy is to be achieved only through the production of capital goods. Among those factors influencing the increase in capital goods, technological change is the most important. Technological change is generally considered to be feasible changes in method to increase physical productivity through storing the original production resources of land and labor in capital goods. Therefore, the expansion of the economy can be made possible through the increase in capital goods by technological progress.

The increase in the production of capital goods generally requires more production resources such as labor and capital goods. This means that more savings on agricultural surplus and labor must flow from the agricultural sector to the nonagricultural sector. Agricultural

products are used as food to feed labor for production of capital goods in the nonagricultural sector. When we recall the implications of wage fund theory in the development economy, the process of transforming agricultural surplus to capital goods is self-evident..

Under the present economic system, however, the relationship between consumption of food and wage payment has some complex problems of exchange The process of such exchange is possible only through the medium of money. Therefore, it is clear that food takes the form of money in the exchange economy and it is paid from wages. As wages must be paid from the sale of capital goods, wages should be considered originally as a part of capital goods, but in the form of money Money is the medium for the transformation of agricultural goods to capital goods in the exchange economy Therefore, agricultural surplus should be considered as capital hidden under the veil of money. The transformation of agricultural surplus to capital goods thus can be possible through the consumption of workers in the nonagricultural sector, which leads to the production of capital goods. In the case of the open economic system, the direct exchange of agricultural products for capital goods through trade will be possible. Therefore, transformation of agricultural products to capital goods is feasible through intersectoral and international transactions.

Chapter 3

Method and Sources of Statistical Estimates for Social Income Accounting of Taiwan Agriculture

Method of Social Income Accounting

The social income account is primarily constructed for the purpose of measuring intersectoral capital flow. This method has two advantages, first, it is possible to check the magnitudes of commodity flow directly. Second, the sources and usage of financial contribution from the agricultural sector to the nonagricultural sector can be investigated. These advantages provided by the social income accounting approach will be most useful for our empirical study in the development oriented economy. An additional exposition will be necessarily given to the approach by the national capital account. In contrast to the approach of social income accounting, the national capital accounting presents the following problems in the practical measurement, first, the assessment on capital assets lacks the sound basis for practical purpose, second, when one item is in both debt and credit sides at the same time, then they generally cancel each other in the capital account These disadvantages in the national capital accounting approach to the subject will lead us to give up some important considerations on gross flow of fund between sectors

Social income accounting generally consists of three important parts (a) sector, (b) accounts, and (c) entries (type of transaction). The sector indicates the parts participating in the economic transaction of national economy. The classification of sector is generally made by grouping the economic units which have similar type of activities. Enterprises, household, public finance, and foreign trade are the most common classifications of economic sectors For practical purposes, we classified the national economy into the following sectors; agricultural production, agricultural household, nonagricultural production, nonagricultural household, public finance and international trade Accounting is divided according to the basic concept of social income accounting into the following items; production, expenditure, and investment Thus, each sector has three accounts The transaction between sectors and between accounts in the same sector become the entries to debit and credit of each account. As production, consumption expenditure, and investment in agriculture are generally integrated into one unit under the farm-family economy system, labor input in agricultural production is mostly derived from family labor and there are no payments for transactions of production goods, labor and products between the farm household and production sectors. Farmers also have some non-farm earnings from the nonagricultural sector. The specific nature of agricultural production makes the scope and sectoral transaction between agricultural production and agricultural household quite complex and it is difficult to separate them into two

sectors. They, unlike the nonagricultural sector and nonagricultural households, need to set up some fictional transactions between accounts in sectors This gives rise to problems of evaluation on commodities and services in transactions between these two sectors.

The following principles are used to solve some difficult problems which will occur in the statistical procedure (a) Landlords are classified into the three categories part-landlords, resident landlords; and absentee landlords As part-landlords actually participate in agricultural production and lease some land to other cultivators, so we include them in the agricultural production sector. The resident and absentee landlords are excluded from the agricultural sector for the following reasons (1) they are generally engaged in nonagricultural economic activities, (2) they are considered as land-lenders whose object is the seeking of land-rent, (3) they have played important roles in the commercialization of agricultural products and investment in agriculture, (4) financial transactions between sectors is generally carried out in rural areas by absentee and resident landlords, (5) after the land reform program, the resident and absentee landlords nearly vanished and this change turned the sectoral capital outflow from the agricultural sector toward different situations By reason of the original nature and function of the resident and absentee landlords and the implications of the change in the sectoral capital flow, we assume these landlords should be classified into the nonagricultural sector.

(b) Agricultural institutions, such as irrigation associations and farmers' associations, are included in the public finance or government sector. Rural cooperatives are considered as part of the nonagricultural sector. Agricultural corporations of sugar, tea, and pineapples, and so forth, are included in the agricultural production sector.

(c) Non-farm income is considered as income produced in nonagriculture and paid for by the supply of labor or other production services from an agricultural household. For the same reason, the family budget of the resident and absentee landlords is excluded from the agricultural household.

(d) In the agricultural household, there are no production and investment accounts Therefore, we assume no productive assets in the agricultural household and that the agricultural household fictionally rents its house and other assets from the agricultural production sector. Depreciation and value increase of fixed assets only happens in the agricultural production sector, so there is neither production activity nor investment activity in the agricultural household sector.

(e) All commodities and services transactions between sectors are in principle valued at farm level. Wage for family labor can be imputed as residual between production and farm production expenses.

In accordance with the above principles, we can construct the social income accounting for agriculture by integrating two sectors of agricultural production and agricultural household with the three accounts, as follows.[1]

(1) Balance sheet of agricultural production

	Debit		Credit
a	Agricultural sector: expenditure on farm production, such as seeds, feeds, and other agricultural materials, and depreciation.	a.	Agricultural sector: same as debit side minus depreciation, incremental value of capital.
b.	Nonagricultural sector. purchase of production goods, fertilizer, pesticides, feeds, agricultural implements, and other materials.	b.	Nonagricultural sector: sale of agricultural products as raw materials
c.	Agricultural household sector: imputed wage for family labor and wage paid to hired labor of other farm families, imputed land-rent for owned farm land and rent paid to the part-landlords, imputed interest for owned capital and interest paid by other farmers.	c.	Agricultural household sector agricultural products consumed on farm household and bought from other farmers.
d.	Nonagricultural household sector· land-rent paid to landlords Interest paid to non-farmer money-lenders.	d.	Nonagricultural household sector sale of farm products directly to nonagricultural household.
	Public finance taxes collected by government and fees paid to FAS and Irrigation Associations.	e.	Public finance· subsidy from government and FAS
		f.	Foreign trade sector export of agricultural goods directly to the rest of the world.

1 T. H. Lee, "A Study on Structural Change of Agricultural Product in Taiwan," Agricultural Economic Seminar Proceedings National Taiwan University 1958

(2) Balance sheet of income and consumption

Debit	Credit
a. Agricultural sector agricultural products consumed on agricultural households and bought from other farmers.	a. Agricultural sector imputed wage for family labor and wage received from other farmers and agricultural investment, imputed land-rent for owned land and received from other farmers, imputed interest for owned capital and interest paid by other farmers.
b. Nonagricultural sector expenditure on nonagricultural goods.	b. Nonagricultural sector wage from nonagricultural sector, property revenue from nonagricultural sector, interest for farmers' investment in nonagricultural sector.
c. Surplus to agricultural sector and nonagricultural sector as investment.	c. Statistical discrepancy.

(3) Balance sheet of savings and investment

Debit	Credit
a. Agricultural sector incremental value of plant, animal and inventories.	a Agricultural sector. depreciation.
b. Agricultural household sector: wage paid to labor input in investment.	b. Agricultural household sector. surplus transferred from the agricultural household sector for investment.
c. Nonagricultural sector purchase of capital goods from nonagriculture.	c. Nonagricultural sector: investment made by landlord and borrowed from financial institutions.
	d. Public finance sector: government and FAS investments in the agricultural sector.

Source and Procedure of Statistical Estimate

The statistical estimate of the above social income accounting for Taiwan's agriculture was made for the periods 1911-1940 and 1950-1960. Before 1911, statistical information is not available for a se ial estimate. During the period 1895-1911, Taiwan was in the initial stage of development in agriculture and industry, and several important social and economic reforms were imposed by Japanese authorities and subsequently followed by the continuous flow of new technology from Japan This period is so important in seeing how Taiwan's agriculture was made to move after such long-term stagnation that we have had to use fragmentary data in order to make an indirect comparison In contrast to the statistical shortage in 1895-1911 period in respect to the period 1940-1950, during the war and the postwar period, most of statistics published by the government were manipulated or voided for reasons of national security. A rapid inflation in the postwar period made valuation of commodity and service transactions between two sectors extremely difficult For these reasons we passed by the estimate for the period 1940 1950 Through the periods estimated, the major statistical sources which were used for the estimate are the following government statistics and survey reports

(1) The farm economic survey for rice-producing farmers in 1925 and 1931-1932 covering fifty sample farmers each, the farm family expenditure survey for rice-producing farmers in 1936-1937 having 189 samples, the farm economic survey in 1950-1951 covering 281 farm families' records The farm income survey and the farm record program have been conducted for 200 farm families every year since 1954

(2) Production cost surveys of major crops such as rice, sugar cane, tea, peanuts and jute and so forth, have been conducted each five years since 1925.

(3) An agricultural yearbook for Taiwan has been published every year since 1911, which includes production of crops and livestock, consumption of fertilizer, area and number of various large trees, population of livestock and farm implements, farm land area and agricultural prices.

The practical procedure of estimate for account items in each balance table is as follows

(A) Balance sheet of agricultural production.

(a) Agricultural sector in both sides of credit and debit. The items included in this account are the value of farm products used on farm as intermediate goods which include seeds, feeds, small trees, miscellaneous materials and depreciation In credit side of this account, incremental value of animal and large trees take the place of depreciation in debit side. Total value of seeds is obtained through "the summation of the total individual seed costs for seventy-six crops " and the total seed cost for individual crops is calculated by

multiplying average seed quantity per hectare by total crop area and by average annual current price of that crop. The average quantity of seed per hectare is quoted from various sources, such as cost survey data, agronomy data in experimental stations, and the special report of crop production made by government and individual research workers. By the searching through the various sources, we could obtain a long series of cost data for main crops, such as rice, sugar cane, sweet potato, and so forth, and an incomplete series for minor crops and livestock [1] Total feed cost is obtained by the summation of the total feed cost for individual livestocks and poultry. The total feed cost for individual items is estimated by multiplying average feed consumption of sweet potato, its vein and vegetables per head by its midyear number and by current average annual prices of feed products. The seedling and small trees are estimated in the same way as is the seed cost Depreciation on farm buildings and implements was estimated through the expansion of per hectare depreciation reported by rice production cost survey Total farm land area is used as the basis for this simple expansion. Incremental value of capital is obtained from the previous study on farm assets estimated by Rural Economics Division of Joint Commission on Rural Reconstruction through the period 1910-1960 [2]

(b) Nonagricultural sector in credit side. Sale of agricultural products to processing industries and livestock slaughtered are included in this account. Most of data is quoted from our previous study on utilization of farm products and livestock.[3] This study includes the comprehensive investigation of production and raw material requirement reported by processing industries in every year. Total number of livestock slaughtered is reported by town or city offices to the Provincial Department of Agriculture and Forestry through their collection of the slaughtering tax A long trend of slaughtering ratio is also used to check the possible omission of livestock slaughtered by exemption of tax and illegal slaughtering. Valuation of those crops and livestock are made at the farm level of average annual prices.

(c) Nonagricultural sector in debit side Purchase of nonagricultural production goods is included in this account, covering chemical fertil-

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1. S. C. Hsieh and T. H Lee, "An Analytical Review of Agricultural Development in Taiwan - An Input-Output and Productivity Approach," Joint Commission on Rural Reconstruction Economic Digest No. 12, July 1958.

2. ECAFE, UN, "Relationship between Agriculture and Industrial Development: A Case Study in Taiwan," Economic Bulletin for Asia and Far East, Vol 14, No. 1, June 1963.

3. Joint Commission on Rural Reconstruction, Rural Economics Division, "Utilization of Agricultural Products," unpublished data.

izers, pesticides, other chemicals, farm machinery and implements, feeds and miscellaneous materials. Total value of chemical fertilizer consumption is obtained from the Taiwan agriculture yearbook, and the fertilizer manual published by the Provincial Food Bureau. These figures have been checked against domestic production, import quantity and carry over, and, lastly, adjusted to the farm price level Some organic fertilizer such as soybean cake and fish bone are also included in this item [1] Pesticides and chemical consumption is based on the report of pesticides and chemical production and import which is estimated by the Joint Commission on Rural Reconstruction annually Total purchase of farm machinery and implements is estimated from statistics of industrial production and foreign trade [2] The Agricultural Censuses of 1955 and 1960 have been used to check the ratio between quantity of farmers' purchase and quantity of production and import over a long period. The limited number of farm economy survey data have also been used for reference.[3] Consumption of purchased feeds is mostly soybean cake and peanut cake Some of these cakes were applied as fertilizer in the early period, and detailed estimates regarding both consumptions have been made by fertilizer and livestock specialists in the "Fertilizer Problem in Taiwan" and "Livestock of Taiwan" published by the Bank of Taiwan The detailed report of fertilizer distribution in the postwar period is published in Taiwan's agriculture yearbook by the Provincial Department of Agriculture and Forestry, and the "Taiwan Food Statistics Book" of Provincial Food Bureau. After deduction of soybean cake and other cakes used for fertilizer from total consumption, the remaining quantity is estimated as feeds The production cost survey of hogs which was undertaken by the Provincial Department of Agriculture and Forestry in 1935 and 1951 give a detailed analysis of the consumption of different feeds by hogs in different types of farming areas These two survey data have been used as key figures in checking the above statistics of total feed consumption and the quantity of feeds purchased by farmers. Miscellaneous materials include spare parts for farm machinery and implements, fuel, materials for house repair, and similar small items. The estimate of these expenses are completely based on "Rice Production Cost Survey" of the Provincial Food Bureau since 1936. Before 1936, an incomplete survey of the rice

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1. Taiwan Provincial Department of Agriculture and Forestry, Agricultural Yearbook, Annual issue.

2. Taiwan Provincial Government, Summary Statistics of Taiwan in Past 51 Years, 1946

3. Taiwan Agricultural Census Committee, Report on the 1956 Sample Census of Agriculture, August 1959 and also Agricultural Census Report for 1960, Vol. 1, 1961

production cost which were undertaken each five years are used. The estimate is made by multiplying per hectare miscellaneous expenses by the total farm land area. Since it includes so many different small items and also since the estimate is based on a value unit, we do not have high confidence in these estimated figures. If our estimate is compared with the per hectare average figures reported in farm economic survey, some underestimate is observed in our statistics. But the increasing trend of expenses corresponds closely to the farm economic survey data.

(d) Agricultural household sector in credit side Consumption of agricultural products by agriculture household is recorded in this account. Purchase of agricultural products between farmers is included. Estimate of farmers' self-consumption is obtained by our previous study on "Utilization of Agricultural Products" and "Food Balance Sheet of Taiwan" published by the Joint Commission on Rural Reconstruction [1] The survey on "Farmers' Sale and Consumption of Agriculture Products" undertaken in 1930 and "Farmers' Purchase and Sale of Farm and Industrial Products" conducted jointly by the Provincial Food Bureau and the Joint Commission on Rural Reconstruction in 1962 are most useful for ascertaining the per capita consumption of individual farm products consumed by farmers and urban population. The basic data estimated in "Utilization of Agriculture Products" were obtained by estimating utilization of individual products through marketing channel The total self-consumption of farm products on farm was estimated by per capita consumption and total agricultural population In our estimate, agricultural products through processing or slaughtering are not accounted as self-consumption So, a great number of farm products through processing are omitted from this account and recorded in the nonagricultural sector in consumption balance sheet

(e) Agricultural household sector in debit side. Estimate of the entries in this account is quite different from other accounts. As family labor, capital, and owned land are not actually paid for their contribution in production, some different imputation methods are adopted for family labor and other production factors Interest for capital and land-rent for owned land were based on the interest rate actually paid by farmers to other sector and the average per hectare land-rent actually paid to a landlord for paddy land and dry land respectively Total farm assets minus liability is considered as owned capital which is estimated from our farm assets estimate Revolving capital which was paid to wage and purchase of production goods is estimated from previous study on input-output and productivity study on agricultural development in Taiwan. [2]

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1. Joint Commission on Rural Reconstruction, Rural Health Division, "Food Balance Sheet of Taiwan," Annual issue.
2. S. C. Hsieh and T. H. Lee, "An Analytical Review of Agricultural Development in Taiwan - An Input-Output and Productivity Approach," Joint Commission on Rural Reconstruction Economic Digest No. 12, July 1958

From the above fixed and current capital, total interest was computed by current average annual interest rate reported by the Bank of Taiwan. Same method is also applied to the estimate of total land-rent Land-rent which has to be imputed to the agricultural sector is based on the different categories of farm, paddy, and dry land, which are actually owned by farmers The remaining amount of land-rent (subtracting the above land-rent for farmers from total land-rent) is imputed as the resident and absentee landlords in the nonagricultural sector. Wages paid to hired labor and family labor were computed separately Wage actually paid to hired labor from other farmers is estimated by multiplying current wage per day by total hired labor days The total hired labor days is quoted from input-output and productivity study,[1] and it was estimated from labor hired for each individual crop reported in crop production cost surveys. Total working days of family labor is also estimated from the crop production cost surveys and livestock production cost survey, but total return to family labor is computed as residual of total net agricultural income subtracting wage paid, capital interest paid and imputed, and land-rent paid and imputed. Viewed from the specific nature of family farming, return to family labor should not be valued at current wage rate, rather be computed as the residual of net farm income.

(f) Nonagricultural household sector in credit side. This account includes the total sale of agricultural products directly to households in nonagricultural sector. The sources of information to estimate the total sale in this account are almost the same as those in farm consumption of agricultural products.

(g) Nonagricultural household sector in debit side. This account includes capital interest and land-rent paid to the nonagricultural households covering resident and absentee landlords, moneylenders and financial institutions The estimate method of this account was described in Section (e) of the agricultural household sector in debit side.

(h) Public finance in credit side. This account includes subsidies provided by government and farmers' associations to farmers to encourage production or adoption of new techniques. The government expenditures on agricultural experiments and extension were not included in this account. In the postwar period, government collected rice and other crops at official prices. The government payment for rice purchase is also included in this account. The differences between the official prices and prices at farm level are accounted as hidden taxes and recorded in debit side. The quantity of government purchase is limited only in the compulsory portion[2] and barter exchange is not accounted here.

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1. Ibid.

2. Taiwan Provincial Food Bureau, Taiwan Food Statistical Book, Annual issue.

(i) Public finance in debit side. Land tax, household tax, agricultural income tax, house tax, car license tax, defense tax, and surtax on the above tax items, fees for farmers' associations and water fee and also hidden tax through collection and barter exchange of farm products at low official prices are included in this account. Government budget statistics including provincial, prefecture, and township offices, the tax report, the annual reports of farmers' associations, irrigation annual report, the unpublished financial report of rice and other crops collected by the Provincial Food Bureau and the annual report of the Joint Commission on Rural Reconstruction were the main sources of information for our estimate of this account [1] To estimate the tax burden shared by the agricultural sector, the following methods are adopted for our estimate Since land tax is separated into city land tax and farm land tax of paddy and dry land in government budget, the household tax paid by agriculture is estimated by total household tax collected by prefecture and township offices (excluding the amount of household tax collected by city government) multiplying by the ratio of the number of farm households in total number of households in the districts of prefecture and township offices House tax is also estimated by same method. Income tax paid by the agricultural sector is obtained by multiplying total income tax collection in city, prefecture, and township offices by the ratio of agricultural income in total national income. This item had no importance in the prewar period, because there was no taxing of farmers' income. Car license tax is mostly charged against oxcart and bicycle This tax is estimated by ratio of oxcart and bicycle owned by farmers in total number of those cars. Defense and surtaxes generally are imposed on every tax at a given rate Therefore, we estimate the total defense and surtax paid by agriculture by multiplying a given rate of taxing on the total amount of taxes of above items paid by agriculture Farmers' Association fees and water fees are directly quoted from annual report of farmers' and irrigation associations or the annual report of the Provincial Water Conservancy Bureau.

(j) Foreign trade sector The direct export of agricultural products only is indicated in this account The exports of processed or manufactured agricultural products are excluded from this item Imports of industrial goods and agricultural commodities are not considered direct transactions between agricultural production and foreign trade The consumption of imported capital goods by agriculture is considered as purchased by agricultural sector from the nonagricultural sector. Prices used for valuation of total exports are fixed at farm level.

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1 Taiwan Provincial Bureau of Accounting and Statistics, Statistical Abstract of Taiwan, Annual issue.
Taiwan Provincial Department of Finance, Finance Statistics of Taiwan, Annual issue.
C. Y. Hsu, "Rural Taxation in Taiwan," Joint Commission on Rural Reconstruction Mimeograph, 1953.

(B) Balance sheet of income and consumption

(a) Agricultural sector in credit side. This account includes an entry from the agricultural household sector in the balance sheet of agricultural production and labor income in agricultural investment, indicating income of farm household derived from agriculture.

(b) Agricultural sector in debit side. This account is identical with the account of the agricultural household sector in the above table of agricultural production.

(c) Nonagricultural sector in credit side. This indicates the items of farmers' income from the nonagricultural sector covering wage and property income and business revenue received from economic activities of farmers in the nonagricultural sector In our estimate, this item comprised the most difficult one because of the scarcity of available data Percentage of nonagricultural income in total farm family income reported in the "Farm Economic Survey" is considered as only one source to estimate non-farm income However, as we mentioned before, the Farm Economic Survey is conducted in a few numbers in the prewar period. Their data are still not enough to cover the changes in non-farm income from time to time. As a matter of fact, we considered it more convenient to estimate this account as the residual of transactions between accounts in the production, consumption, and investment balance tables In view of the cash balance in the balancing of farm economy, this estimation will be not so far from the actual situation Thus, statistical discrepancy between three balance tables will also be included in this account Through our comparison of the estimated amount with the non-farm income reported in the Farm Economic Survey, a similar trend is found in the two series Roughly speaking, the percentage of non-farm income in total farm family income has increased through time. In the original farm economic survey, non-farm income means income received from outside farm work and economic activities in the nonagricultural sector Therefore, it includes income from both sectors, agriculture and nonagriculture. Only income from the nonagricultural sector is taken into consideration in our case. So the above comparison of two series is based on the adjusted non-farm income in the Farm Economic Survey

(d) Nonagricultural sector in debit side. Purchase of consumer goods from the nonagricultural sector is recorded in this account. Processed agricultural goods are undoubtedly considered as entries in this account The estimate of this account is based on the linear relationship between per capita agricultural household consumption and per capita agricultural net income and then by subtracting the per capita self-consumption of agricultural products from per capita total agricultural consumption. The linear relationship between per capita agricultural net income and per capita consumption is made by two series of estimated per capita agricultural income and per capita consumption reported in the Farm Economic Survey conducted in 1925, 1931-1932, 1936-1937 and 1950-1960. Per capita consumption of nonagricultural goods thus obtained is expanded

by total population in agriculture to get total consumption of nonagricultural goods in the agricultural sector.

(e) Surplus to agricultural sector and nonagricultural sector. This is the balance item of agricultural household in relation to income and consumption which will be appropriated into agricultural and nonagricultural investment The former is the entry from Appendix Table 3, the Balance Sheet of Saving and Investment Nonagricultural investment includes deposits in bank and rural credit cooperatives and the buying of bonds and stocks in industrial enterprises Estimate of nonagricultural investment is based on the annual reports of rural credit cooperatives and capital accounting in the farm economic survey data In reference to changes in capital stock and deposits of rural credit cooperatives, a detailed analysis of sources of those funds has been reported in the annual reports of the rural credit cooperatives. For instance, landlords, businessmen, owner cultivators, and tenants are the main categories for this classification. Contribution of capital from agriculture to rural credit cooperatives is estimated through these annual reports. Other types of capital transfer are estimated from the farm economic survey and farmers' financial survey.[1]

(C) Balance sheet of savings and investment.

(a) Agricultural sector in credit side: entry of this account is the depreciation which can be posted from the agricultural sector in debit side of Appendix Table 1.

(b) Agricultural sector in debit side: this account is identical with the agricultural sector in credit side of Appendix Table 1.

(c) Agricultural household sector: this account is posted from surplus to the agricultural sector in debit side of Appendix Table 2.

(d) Agricultural household sector in debit side· wage paid to farmers for their labor input in agricultural investment is recorded in this account.

(e) Nonagricultural sector in credit side· investment made by landlords and funds borrowed from financial institutions are included in this account. As irrigation investment cost is generally to be shared by landlords, their contribution is estimated by ratio of land area owned by absentee landlords in total farm land area. Investment funds borrowed from financial institutions are estimated from annual reports of rural credit cooperatives, the land bank, and the cooperative bank. Intermediate and long-

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1. Cooperative Bank of Taiwan, Annual Statistics of Credit Cooperatives, Annual issue.
Taiwan Provincial Department of Agriculture and Forestry, Report on Agricultural Credit, 1951, 1960 issue.

term agricultural loans made by those financial agencies are quoted as investment funds from nonagriculture.

(f) Nonagricultural sector in debit side. Purchase of capital goods is included in this account Estimate of capital goods input in investment is separately made by type of investment, such as irrigation, house construction, machinery and land reclamation The ratio of capital goods input in per unit agricultural investment has been estimated by the engineers in "Irrigation Problems in Taiwan."[1] Those ratios were applied to the estimate of the amounts of labor input and capital goods input in the total agricultural investment.

(g) Public finance sector in credit side. The amount of agricultural investment made by the government, farmers' associations and the Joint Commission on Rural Reconstruction is the entry of this account Estimation of their investment is based on the government's annual budget, and the annual reports of farmers' associations and the Joint Commission on Rural Reconstruction

The above outline shows the procedure of statistical estimation of social income accounting for agriculture. The estimation of intersectoral net capital transfer in the period 1895-1910 will be made only on some important statistics, which include factor price payment, government taxing, and financial transactions.

The terms of trade is considered as the ratio of prices received and paid by farmers at farm level To analyze the effect of changes in the terms of trade on net real capital transfer, two price indices were computed with the following procedure. Price index of farmers' receipt was calculated with the weight of average production quantity in 1935-1937.[2] The marketable agricultural products were selected for this computation. This price series was computed first in 1958 and has been revised several times for the purposes of our study of Taiwan's agricultural development. The index of price paid by farmers has been computed for thirty-two items by the Joint Commission on Rural Reconstruction and Provincial Government since 1950 and has been published after 1952[3]

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1. Bank of Taiwan, "Irrigation Problems in Taiwan," No. 4 Special Series, July 1950.

2. S. C. Hsieh and T H. Lee, "Agricultural Development and its Contribution to Economic Growth in Taiwan," Joint Commission on Rural Reconstruction Digest Series No 17, April 1966, pp. 36-37.

3. Provincial Department of Accounting and Statistics, Indices of Prices Received and Paid by Farmers, Monthly issue, since 1950.

During this period, a revision of items, weight- and price-reporting system has been made twice. However, some agricultural commodities such as rice, sweet potatoes, and some other important goods are also included in the items of price index paid by farmers. This makes the index of price paid biased and to move in parallel to the index of price received by farmers. At the present time, we have no method to correct such statistical bias for this series in postwar period For the prewar period, we have newly constructed a series of price paid by farmers by the following method. Its statistical result is shown in Appendix Table 5 Six items of commodities for production and seven items for living expenditure were selected for computation with the percentage of farmers' expenditure on those commodities in total expenditure in 1935-37 Prices of those commodities at farm level are not available. Therefore, the wholesale prices were used for computing the trend of each commodity price To connect these two series of the prewar and postwar price indices paid by farmers, 1952 and 1937 were selected as connecting points. The computing results have no significant difference The terms of trade thus computed was compared with the old price ratio between price index received by farmers and general price index which we have used for a time The result shows us that there are no great upward and downward discrepancies in trend between the two indices.

Chapter 4

The Results of Measurement of Intersectoral Capital Flows--Taiwan 1895-1960

Statistical results derived from social income accounts and statistical measurements for intersectoral capital flows in Taiwan are presented in Appendix Tables 1, 2, and 3. In this chapter, some important statistical findings are summarized, including the reports on income, consumption, and savings-investment in the agricultural sector and the statistical facts of intersectoral capital flows.

The derivation of statistics for intersectoral flows are based on the social income account of agriculture. The presentation of social income statistics is, therefore, helpful for understanding the causal relationship between the amount and trend of sectoral capital flows and the basic economic situation in agriculture. The presentation of statistics will be limited to some important indicators of agricultural development

The statistical results derived from social income accounts of Taiwan's agriculture for the period 1911-1960 are initially expressed at the current price of T$ before 1940 and NT$ after 1950 Converting it to constant value with 1935-1937 as the base, total agricultural production increased steadily from T$ 167 million in 1911 to T$ 397 million in 1940. In the postwar period, it increased from T$ 420 million in 1950 to T$ 676 million in 1960 Total farm family income in 1911 was only T$ 101 million and it increased to T$ 240 million in 1940. After 1950, it increased from T$ 343 million to T$ 490 in ten year period. Total agricultural investment was about T$ 8 million or 8 3 percent of total farm family income in 1911. It increased to T$ 43 million in 1940, and the proportion of investment of total farm family income also increased to 18 percent during this period In the postwar period, total investment increased from T$ 60 million in 1950 to T$ 115 million in 1960, and the proportion of investment of total farm family income increased from 17.6 percent to 23.5 percent. Total consumption and savings of farm household were, respectively, T$ 96 million and T$ 7 million in 1911, and increased to T$ 209 million and T$ 30 million in 1940 The saving ratio which these amounts of savings represent increased from 5 percent to 12.4 percent In the postwar period, respectively, consumption and farm saving were T$ 295 million and T$ 50 million in 1950, and T$ 370 million and T$ 118 million in 1960. The saving ratio for the farm sector increased from 14 percent to 24.3 percent during the same period. If we convert those statistics to the per capita real price basis, they can be shown in the following table

During fifty years from 1911 to 1960, the gross agricultural products per worker at constant 1935-1937 prices, or the average gross labor productivity of agriculture, increased by about 146 percent which is

quite similar to our previous study of agricultural development in Taiwan.[1] Roughly speaking, agricultural productivity of labor in Taiwan increased at an annual growth rate of 1.8 percent in the long period. Column 2 of Table 1 shows the per capita farm household income, indicating the changes of farmers' share of agricultural products and some extra earnings from the nonagricultural sector. As agricultural population increased at a more rapid rate than the agricultural labor force, per capita farm household income increased by only 95 percent or at 1 3 percent per year in the same period Per capita consumption in column 3 shows its increase by 56 percent or at an annual growth rate of only 0.9 percent The wage rate in agriculture was T$ 0.62 per day in 1911 on the 1935-37 basis and it increased to T$ 0.91 per day in 1935 and decreased to T$ 0.69 per day in 1960. Comparing the changes of three figures in columns 1, 2, and 3 with wage rates in agriculture, we can conclude that per capita consumption in agriculture comparatively has a close relationship with the wage rate in agriculture During the same period, per capita savings of the agricultural population, increased from 100 in 1911 to 884.6 in 1960 at the rapid annual growth rate of 4.5 percent. Farmers' desire for savings is greater than their demand for consumption goods Agricultural investment per worker in column 5 indicates the change in capital intensity in Taiwan's agriculture This is an indication of how agricultural labor productivity in Taiwan could have been raised in the past fifty years. Increase in per capita investment in agricultural production with a given technological change is the major cause for agricultural development in Taiwan. Investment declined, however, from T$ 23 1 in 1930 to T$ 11 6 in 1935.

Summarizing the above statistics derived from the social income account for Taiwan's agriculture, we can point out the following specific points

(a) Net agricultural production increased at an average annual growth rate of 3 percent, and the increase in labor productivity was 1.8 percent per annum through the period 1911-1960. These are slightly higher than the 2.67 percent and 1 6 percent of the previous study, which were based on the gross output at 1935-1937 constant price.[2] Compared with the annual growth rate of 1.17 percent of Japan's agriculture in the period of 1877-1960, it was a much faster rate of growth in agricultural production.[3]

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1. S. C. Hsieh and T. H. Lee, "Agricultural Development and its Contribution to Economic Growth in Taiwan," Joint Commission on Rural Reconstruction, Economic Digest Series No. 17, April 1966, p. 15

2. ibid., pp. 14, 45.

3. Kazushi Ohkawa and Bruce F Johnston, "The Transferability of Japanese Pattern of Modernizing Traditional Agriculture," prepared for Conference of the Role of Agriculture in Economic Development at Princeton University, National Bureau of Economic Research, December 1-2, 1967, p. 7.

Table 1. Summary statistics from social income account of Taiwan agriculture, 1911-196(

unit: 1935-1937 price

Year	Agri. prod. per worker	Per cap. F.H. income	Per cap. consump.	Per cap. savings	Agri.inv. per worker	Agri. population (1,000)	Agri. labor (1,000)	Agri. wage rate
1911	156 (100.0)	48.5 (100.0)	45.9 (100.0)	2.6 (100.0)	7.5 (100.0)	2,106	1,106	0.62 (100.0)
1915	148 (94.9)	46.2 (95.3)	43.9 (95.6)	2.3 (88.5)	5.5 (73.3)	2,240	1,165	0.50 (90.3)
1920	172 (110.3)	49.9 (102.9)	47.0 (102.4)	2.9 (111.5)	10.1 (134.7)	2,279	1,140	0.52 (83.9)
1925	238 (152.6)	71.7 (147.8)	63.4 (138.1)	8.3 (319.2)	23.6 (314.7)	2,322	1,152	0.71 (114.5)
1930	258 (165.4)	71.6 (147.6)	66.5 (144.9)	5.1 (196.2)	23.1 (308 0)	2,512	1,212	0.69 (111.3)
1935	289 (185.3)	82.4 (169.9)	74.7 (162.7)	7.7 (296.2)	11.6 (154.7)	2,746	1,325	0.91 (146.8)
1940	290 (185.8)	81.3 (167.6)	71.3 (155.3)	10.0 (384.6)	30.6 (408.0)	2,955	1,400	0.76 (122.6)
1950	278 (178.2)	87.2 (179.8)	74.7 (162.7)	12.5 (480.8)	35.0 (466.7)	3,939	1,731	0.51 (82.3)
1955	327 (209.6)	89.8 (185.2)	65.8 (143.4)	24.0 (923.1)	60.0 (800.0)	4,546	1,737	0.62 (100.0)
1960	385 (246.8)	94.6 (195.0)	71.6 (156.0)	23.0 (884.6)	65.6 (874.7)	5,174	1,754	0.69 (111.3)

Source: Appendix tables 1, 2 and 3.

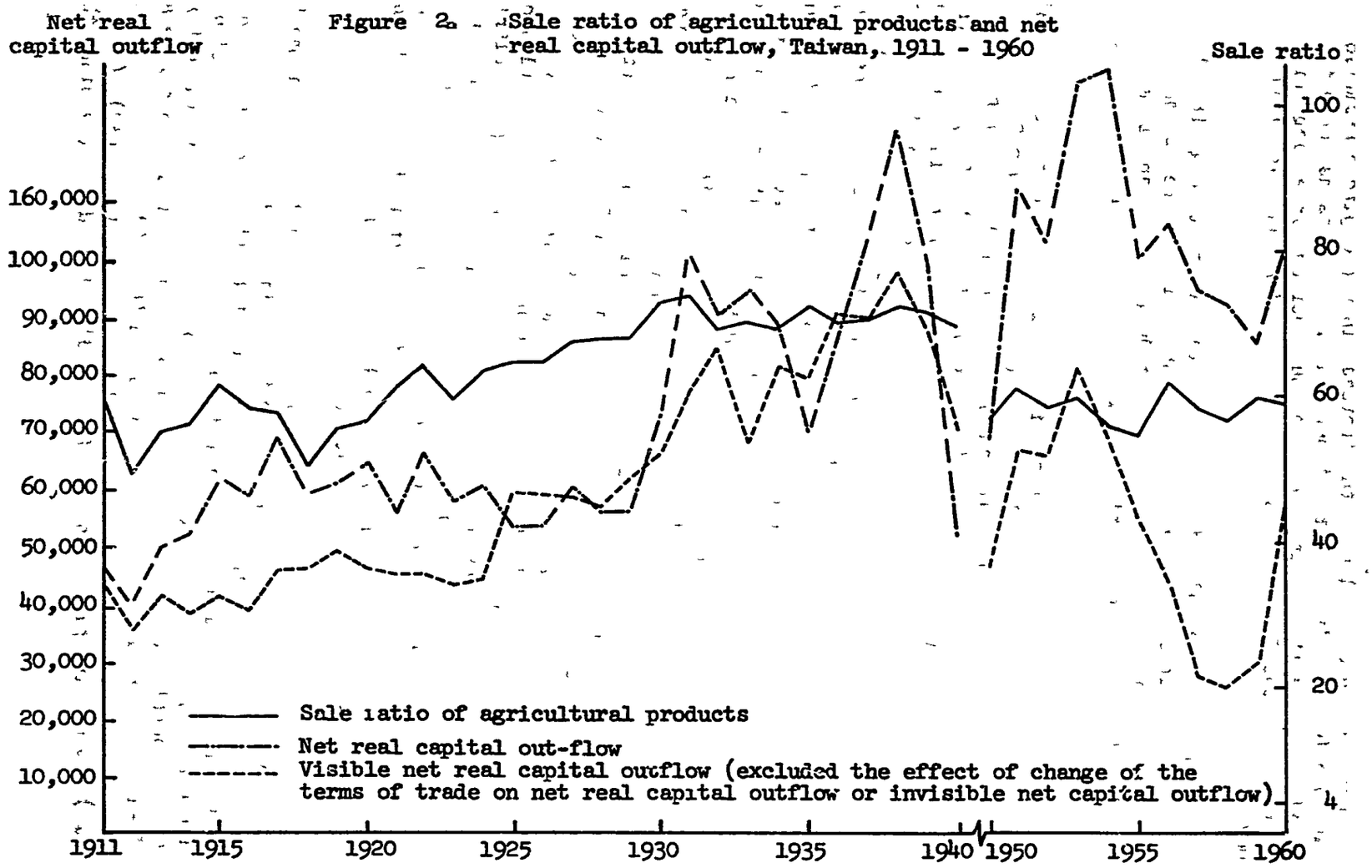
(b) Despite the rapid increase in agricultural output and average labor productivity in agriculture, the increase in per capita consumption of farm people was only 0 9 percent per annum. Two reasons account for this trend of per capita consumption One, the increase in agricultural population; two, the farmers' desire for more savings and high land rent payment.

(c) High annual growth rate of per capita savings through the whole period is particularly impressive. It shows a close relationship with per capita investment per worker, except during 1930, and is a positive factor influencing the amount of capital outflow from the agricultural sector.

The sectoral net real capital flow derived by equations (11) and (12) is shown in Appendix Table 5 and summarized in Table 2 of this chapter. Figure 2 indicates the long-run changes in net real capital flow and net agricultural surplus (net real visible capital flow) They were all positive for agriculture through the period under review. The agricultural sector has continuously made a contribution of capital to the nonagricultural sector in Taiwan Dividing net real capital outflow into the visible and the invisible net real capital outflows, as explained in the previous section, the visible net real capital outflow, or net real agricultural surplus, was increasing before World War II and declining after World War II Comparing the trend of visible net real capital outflow with sale ratio of agricultural products, both series had a close relationship in the period before 1930 and they had no relationship in the periods of 1930-1940 and after 1950. In the latter, the sale ratio was comparatively constant, but visible net real capital outflow fluctuated remarkably Sale ratio in the period of 1950-1960 was lower than that in the prewar period Invisible net real capital outflow or inflow can be shown by the difference of net real capital outflow and visible net real capital outflow in Figure 2. Except for the years, 1925, 1926, 1928, 1929, 1935, and 1936, the invisible net real capital flow showed the outflow, indicating the terms of trade being against agriculture. As seen in Figure 2, invisible net real capital outflow was particularly large in the postwar period. The terms of trade between the agricultural sector and the nonagricultural sector have shown some up-and-down movements and there is no definite trend through the long period. Roughly speaking, the terms of trade were against agriculture before 1925 and were toward agriculture in the period 1925-1940 In the postwar period, it was most unfavorable for agriculture.

The statistics for the period 1911-1960 in Table 2 are the most important. They are summarized from the statistical estimate of social income sheet in Appendix Table 5, and the statistics for the period 1896-1910 were estimated from the financial aspects of capital flow. Table 2 shows clearly the component factors in relation to the net real capital outflow from the agricultural sector in Taiwan. To arrive at Item 13, net real capital outflow (B'), in the table, the procedures for calculation are based completely on the equations (9'), (10), (11), and (12) above. The gross outflow of agricultural products (X) minus the

Figure 2. Sale ratio of agricultural products and net real capital outflow, Taiwan, 1911 - 1960



SOURCE: Derived time from Appendix Table 1 and 4.

Table 2. Intersectoral capital flows between the agricultural sector and the nonagricultural sector, (five years average), Taiwan, 1895-1960

unit: thousand T$

Item	1896-1900*	1901-1905*	1906-1910*	1911-1915	1916-1920	1921-1925
1. Total agricultural production (Ya)	44,526[1]	55,556[1]	66,421[1]	97,358	187,968	242,505
2. Total sale of agricultural products(X)	-	-	-	54,829	105,479	154,625
3. Total sale ratio ($\frac{X}{Ya}$)	-	-	-	56.3	56.2	63.8
4. Total outflow of agricultural products(X)	-	-	-	54,829	105,479	154,625
a. To nonagricultural production(R_a^n)	-	-	-	27,664	55,903	77,888
b. To nonagricultural household(C_a^n)	-	-	-	17,853	29,606	40,907
c. To foreign countries (E_a)	-	-	-	9,312	19,970	35,830
5. Total inflow of nonagricultural products(M)	-	-	-	30,563	63,376	104,736
a. Working capital goods (R_n^a)	-	-	-	5,625	17,208	28,737
b. Fixed capital goods (I_a)	-	-	-	657	2,487	8,292
c. Consumer goods (C_n^a)	-	-	-	24,281	43,681	67,707
6. Net commodity outflow (B = X - M)	-	-	-	24,266	42,103	49,889
7. Gross outflow of fund (F)	14,779	19,938	23,272	28,678	52,549	67,859
a. Land rent and interest (Z)	13,430[2]	16,911[2]	18,803[2]	22,235	42,850	51,791
b. Taxes and fees (J)	1,349[4]	3,027[4]	5,469[4]	6,175	8,810	15,083
c. Transfer of fund through financial institutions (Q)	- [5]	-	-	268	889	985
8. Gross inflow of fund (G)	776	1,616	1,946	4,412	10,446	17,970
a. Public investment and subsidy (S)	220[4]	967[4]	547[4]	1,683	1,413	3,200
b. Investment by nonagricultural sector in agriculture (H)	- [5]	-	-	329	1,320	2,930
c. Income received from the nonagricultural sector (W)	556[3]	649[3]	1,399[3]	2,400	7,713	11,840

(continued)

Table 2. (continued)

Item	1896-1900*	1901-1905*	1906-1910*	1911-1915	1916-1920	1921-1925
9. Net outflow of fund (B = F - H)	14,003	18,322	21,326	24,266	42,103	49,869
10. Terms of trade ($T = \frac{Pn}{Pa}$)	-	-	-	121.4	130.2	122.1
a. Agricultural price index (Pa: 1935-37=100)	-	-	-	59.8	91.8	101.9
b. Nonagricultural price index (Pn: 1935-37=100)	-	-	-	72.6	118.9	114.2
11. Visible net real capital outflow ($V_1 = \frac{B}{Pa}$)	-	-	-	40,579	46,115	48,959
12. Invisible net real capital outflow $\overline{V}_2 = M/_{Pn}$ (T-1)7	-	-	-	9,009	16,113	11,070
13. Net real capital outflow ($B' = X/_{Pa} - M/_{Pn}$)	14,003	18,322	21,326	49,588	62,228	60,029
14. $X/_{Pa}$	-	-	-	91,686	115,530	151,742
15. $M/_{Pn}$	-	-	-	42,098	53,302	91,713

Source: Derived from Appendix Table 4.

(continued)

*Sources and estimation procedure for 1896-1910:(1) Total agricultural production value from 1902 to 1910 was quoted from "Taiwan Agricultural Statistics," annual issue. The data prior to 1902 was estimated using the growth rates of total cultivated land area and of agricultural population. The per capita agricultural production in unit land area (hectare) in 1902 was used as the basis to extrapolate back by each year's agricultural population and cultivated land area. (2) For estimate of land rent and interest in each year, the ratios of land rent and interest to total agricultural production was used. Twenty-eight percent was used for the period of 1904-1910 after land reform program and a proportion of 31 percent was used for the period of 1896-1903. (3) Estimate of nonfarm income received by farmers was based on the ratio between nonfarm income and industrial production value. Industrial production value was 43,912 thousand yen and nonfarm income was 2,587 thousand yen in 1911. The ratio of nonfarm income was 5.8 percent of industrial production value. The source of data is "The Commercial and Manufacturing Statistics," The Taiwan Governor General Office, annual issue. (4) Taxes, government subsidy and investment were quoted from "The Reports of Government Budget," annual issue. (5) The figures of agricultural loan and saving deposit in financial institutions were unknown. No financial institutions existed in rural areas in this period.

Table 2. (continued)

Item	1926-1930	1931-1935	1936-1940	1950-1955	1956-1960
1. Total agricultural production (Ya)	296,760	290,597	507,819	7,210,674	16,028,408
2. Total sale of agricultural products(X)	204,070	208,470	362,474	4,183,722	9,664,662
3. Total sale ratio ($\frac{X}{Ya}$)	68.8	71.7	71.4	58.0	60.3
4. Total outflow of agricultural products(X)	204,070	208,470	362,474	4,183,722	9,644,662
a. To nonagricultural production (R_a^n)	105,840	88,287	163,606	2,013,044	4,925,649
b. To nonagricultural household (C_a^n)	47,509	48,356	81,858	1,941,976	4,177,284
c. To foreign countries (E_a)	50,721	71,827	117,010	228,702	561,729
5. Total inflow of nonagricultural products(M)	143,398	145,886	260,692	3,267,665	8,716,325
a. Working capital goods (R_n^a)	45,337	47,053	82,407	1,052,583	2,594,395
b. Fixed capital goods (I_a)	11,439	8,201	9,462	107,100	1,196,321
c. Consumer goods (C_n^a)	86,622	90,632	168,823	2,107,982	4,925,609
6. Net commodity outflow (B = X - M)	60,672	62,584	101,782	916,057	948,337
7. Gross outflow of fund (F)	76,031	75,853	134,818	1,337,180	2,616,115
a. Land rent and interest (Z)	59,272	55,828	98,299	531,969	738,790
b. Taxes and fees (J)	15,991	16,985	30,144	711,555	1,452,694
c. Transfer of fund through financial institutions (Q)	768	3,040	6,375	93,656	424,631
8. Gross inflow of fund (G)	15,359	13,269	33,036	421,123	1,667,777
a. Public investment and subsidy (S)	3,638	1,026	2,147	26,154	71,432
b. Investment by nonagricultural sector in agriculture (H)	6,496	3,101	5,343	11,625	44,171
c. Income received from the nonagricultural sector (h)	5,225	9,142	25,546	383,344	1,552,174
9. Net outflow of fund (B = F - H)	60,672	62,584	101,782	916,057	948,338
10. Terms of trade ($T = \frac{Pn}{Pa}$)	99.7	106.9	102.1	125.7	119.8
a. Agricultural price index (Pa: 1935-37=100)	102.9	80.4	120.2	1404.9	2483.5
b. Nonagricultural price index (Pa: 1935-37=100)	102.6	85.9	122.7	1766.0	2974.9
11. Visible net real capital outflow ($V_1 = \frac{B}{Pa}$)	58,962	77,841	84,677	65,204	38,186

(continued)

Table 2. (continued)

Item	1926-1930	1931-1935	1936-1940	1950-1955	1956-1960
12. Invisible net real capital outflow $\overline{V_2 = M/_{Pn} \quad (T-1)}$	(-) 407	11,618	4,519	47,559	58,003
13. Net real capital outflow $(B' = X/_{Pa} - M/_{Pn})$	58,555	89,459	89,196	112,763	96,189
14. $X/_{Pa}$	198,319	259,291	301,559	297,795	389,155
15. $M/_{Pn}$	139,764	169,832	212,463	185,032	292,966

gross inflow of nonagricultural products (M) is the net commodity outflow or inflow at current price (B). If there is outflow, it is generally called net agricultural surplus. The difference between gross outflow of funds (F) and gross inflow of funds (G) is the net outflow of funds or inflow of funds (B). It is clear from Table 2 that net commodity outflow (B) is identical with net outflow of funds, indicating that the financial aspect and the physical aspect of net capital outflow are all-important to analyze the determinants of net capital outflow. Item 10 in the table is the terms of trade (T), representing the purchasing power of the agricultural price. Items 11, 12, and 13 indicate the visible net real capital outflow (V_1), invisible net real capital outflow (V_2), and net real capital outflow (B'). As already shown in equations (11) and (12), they have the following relations:

$$B' = B/P_a = V_1 + V_2 = B/Pa + M/P_n\ (T-1) = X/Pa - M/Pn$$

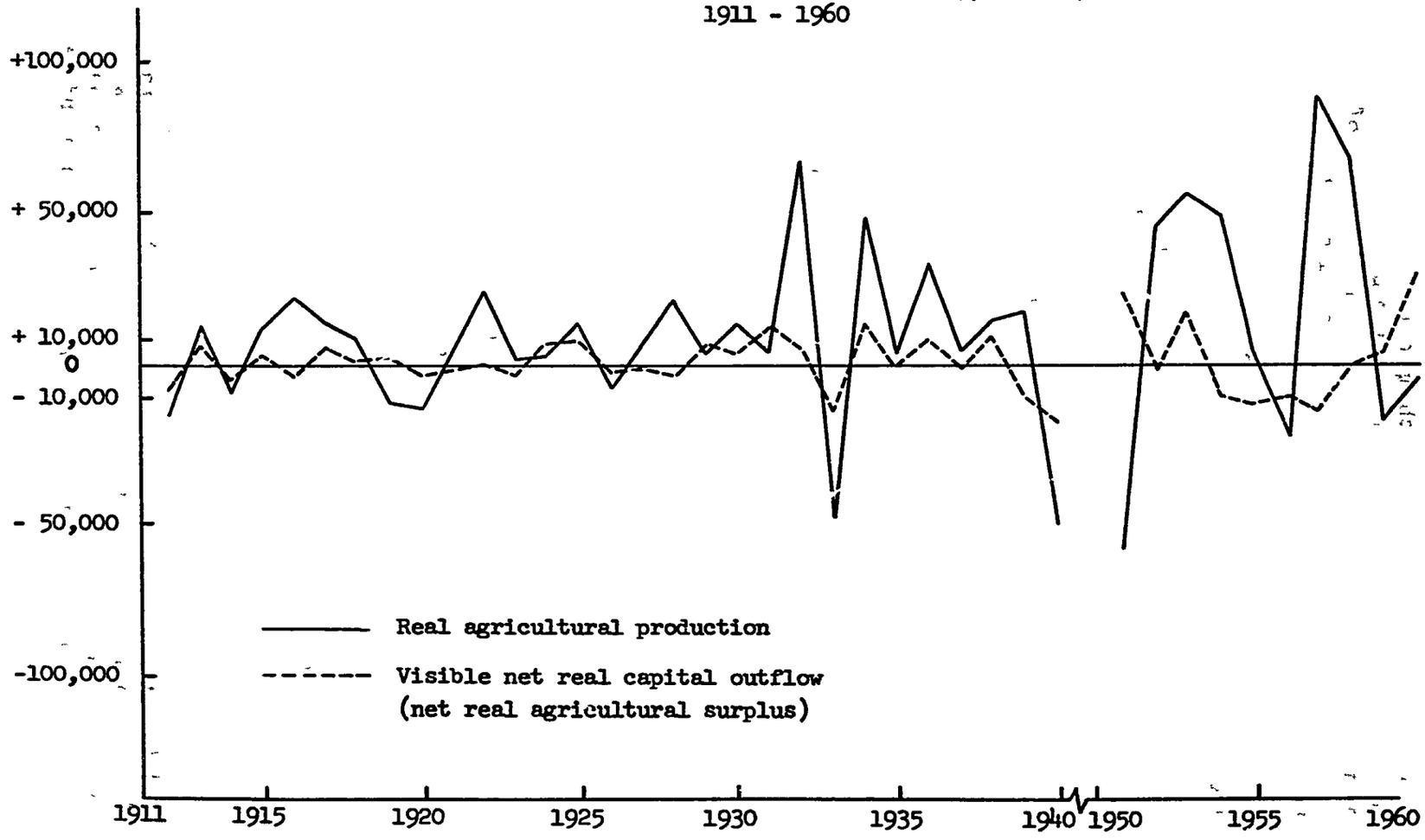
Furthermore, the net outflow of funds can be divided into balance of current capital (R) and balance of capital transfer (K).

From the systematic accounting of net real capital flows between sectors in Table 2 it is important and useful to make a comparative analysis between our definition and other definitions of the sectoral capital flows. Item 7c in the table indicates the fund outflow through financial institutions which is generally called gross savings in agriculture. The amount of net savings in agriculture can be obtained by deducting Items 8 a and b, public investment and subsidy and investment in agriculture by the nonagricultural sector from the gross savings in agriculture. This terminology is most broadly used in papers on development economics. It is very apparent that the amount of net savings in agriculture is far less than the amount of net outflow of funds (B), and they each have a different trend of change through the long period. As we mentioned before, the term net savings in agriculture is not appropriate for sectoral capital outflow. With respect to net outflow or inflow of funds, we need to say a few words about the funds flowed into agriculture through the provision of labor, capital, and property services of the agricultural sector to the nonagricultural sector and funds flowed out from the agricultural sector for payment of land rent and interest to the nonagricultural sector. The difference between the two items is defined as the net outflow or inflow of capital through the current account of funds. The most probable objection to this accounting is that these items should not be included in the accounting of sectoral capital flow. If this is correct, balance of social income account and change in national capital accounts will not correspond with each other, and a systematic accounting of the sectoral capital flow will be impossible. Because the payment of the factor services between sectors is an important component of the sectoral income stream and the balance is the financial claim of one sector against another sector, this is also the source of capital contribution of one sector to another sector. Objections to our accounting procedure presumably stem from the misconceptions about capital, a matter which was discussed earlier. The total real agricultural surplus (TAS) is also an important conventional scale for measuring the sectoral

capital outflows. In Table 2, Item 14 shows the real total sale of agricultural products (TAS) to the nonagricultural sector. The amount of this item is larger than net commodity or net fund outflow and also larger than visible and invisible net real capital outflow. Comparing the trend of total real outflow of agricultural products with that of the net real capital outflow, we cannot find a relationship between the two series This means also that the total real outflow of agricultural products (TAS) is not a good indicator of net real capital contribution of the agricultural sector. From the above discussion, it is clear that different statistical scales derived from different conventional concepts of the sectoral capital flows show different magnitudes of capital contribution and different trends of changes. Net real capital outflow in Item 13 derived on the basis of some rigorous definition and systematic accounting for capital can be considered the most inclusive and appropriate scale to measure the sectoral capital outflow from agriculture. Therefore, we will attempt to identify the important components of the net real capital outflow in the case of Taiwan's agricultural development.

The factors determining the net real capital outflow are net real agricultural surplus, or visible net real capital outflow, and change in terms of trade Net real agricultural surplus has a close relationship with the increase in real agricultural production The relationship between two components is dependent on the changes in the sale ratio of agricultural products The sale ratio, as shown in Figure 2, had three different phases it increased in the period 1911-1930, it was stable at a higher level from 1930 to 1940, it was unstable at a lower level in the postwar period 1950-1960. Net agricultural surplus has shown correspondingly different shapes of change with fluctuations of agricultural production Figure 3 indicates the relationship between changes in real agricultural production and in net real agricultural surplus. The annual alteration of net real agricultural surplus was quite regular in the period 1911-1930. The increasing trend of the sale ratio and the comparatively stable increase in real agricultural production are important relevant factors In the period 1930-1940, the sale ratio was stable and real agricultural production fluctuated greatly; consequently the net real agricultural surplus showed great fluctuation. The sale ratio showed a declining trend at the lower level and real agricultural production showed great up-and-down movements in the period of 1950-1960 Therefore, net real agricultural surplus changed irregularly. From this observation, we know that the increases in real agricultural production and sale ratio are important factors to increase the net real agricultural surplus. In the total sale of agricultural products during the whole period, sale of agricultural raw materials represented more than half, as seen in Table 2 Sale to the nonagricultural household was about 33 percent of total sales of agricultural products during 1911-1915, but decreased to about 23 percent during 1935-1940 It increased again to 43 percent in 1956-1960. Percentage of direct agricultural exports in the total sale of agricultural products was about 7 percent in 1911-1915, increased to 32 percent in 1936-1940, and then decreased to 6.5 percent in 1956-1960 These facts show that composite factors of total sale or demand for agricultural products in Taiwan have varied in their

Figure 3. The first differences of real agricultural production and real net agricultural surplus (or visible net real capital outflow), Taiwan, 1911 - 1960



SOURCE: Appendix Table 1 and 4.

importance in accordance with changes in population growth, level of people's income, foreign market conditions, and development of domestic industry. Through the whole period, a small portion of agricultural surplus was consumed by the nonagricultural household sector, but it has become more important in the postwar period

Of the total inflow of nonagricultural products, consumer goods accounted for 79 percent in 1911-1915, but declined to 65 percent in 1936-1940. In the postwar period, consumer goods made up 65 percent of the inflow in 1950-1955 and 57 percent in 1956-1960. These proportions coincide with the slow increase in per capita consumption in Table 1. Working capital goods for agricultural production, including chemical fertilizer, feeds, chemicals, and farm implements and tools, were only 8 percent of total inflow of nonagricultural products in 1911-1915, increased rapidly to 32 percent in 1936-1940, and declined to 30 percent in 1956-1960 Consumption in agriculture of fixed capital goods which flowed from the nonagricultural sector was only 2 percent of total inflow of nonagricultural goods in 1911-1915 and increased to 6 percent in 1931-1935 and declined thereafter In the postwar period, this consumption increased from 3 percent in 1950-1955 to 14 percent in 1956-1960 Demand in the agriculture sector for nonagricultural goods was determined by a mix of the above factors, in which demand for consumer goods was large in the initial period and demand for working capital goods and fixed capital goods became larger in the later period of agricultural development. In particular, demand for fixed capital goods significantly increased in the period 1956-1960, but its total amount was still small compared with other items.

Gross outflow of fund includes such items as (a) land rent paid to the resident and absent landlords and interest paid to financial institutions and money lenders; (b) government taxing and donations, and fees paid to irrigation association and farmers' associations, (c) net savings deposited and invested in nonagriculture through financial institutions. About 78 percent of all funds were paid as land rent and interest in 1911-1915. This percentage declined to about 73 percent in 1936-1940 After land reform in the postwar period, it was only 28 percent of total gross outflow of funds Taxes and fees in the prewar period remained 17 to 22 percent of gross outflow of funds This amount increased to 53 percent in 1950-1955 and to 56 percent in 1956-1960. The above items, (a) and (b), are generally considered as entries in the current account Item (c) is an entry in the capital account The autonomous flow of capital funds was a very limited amount in the beginning and increased to 16 percent in the period 1956-1960. These facts tell us that there was a specific type of transferring of agricultural funds to the nonagricultural sector in the developing process of this underdeveloped area.

Gross inflow of funds includes (a) public investment and subsidy, (b) investment in the agriculture sector made by landlords, and long-term loans from financial institutions, (c) farmers' receipts of nonfarm income. Public investment and subsidy to agriculture have exceeded 38 percent of total gross inflow of funds in the initial period and declined to below

4 percent in 1956-1960. Conversely, nonfarm income increased steadily from 54 percent in 1911-1915 to 93 percent in 1956-1960. Investment made by absent landlords and long-term loans borrowed from financial institutions also increased from 7 percent in 1911-1915 to 16 percent in 1936-1940 and declined sharply in the postwar period. Land reform programs and limited amounts of long-term funds for agriculture contributed to this decrease in the postwar period.

In order to make a further analysis of the impact of net real capital outflow on economic development as a whole, relevant statistics have to be presented. Some leading economists have discussed the impact of agriculture's capital contribution on economic development only from the viewpoint of intersectoral capital flow [1] Our analysis of the broad scope of net real capital outflow creates some difficulty and needs to be broken down into the composite factors Consequently, growth rate of national income as the total effect of such sectoral capital contribution will be discussed. For this purpose, estimates of national income, total capital formation, wage rates in two sectors, export and import surpluses, indices of industrial production, share of labor income, labor productivity, and government receipts and expenditures have been presented in Table 3 It shows us that the net domestic product of Taiwan has increased steadily at an average growth rate of 3.0 percent through the entire period under review. Although the growth rate annually averaged 4 1 percent in the prewar period from 1911-1915 to 1936-1940, it was 8 0 percent in the period from 1950-1955 to 1956-1960. Such rapid growth of the national economy was largely due to rapid accumulation of capital at a given technological level. Capital formation of the total national economy increased at 4.3 percent annually in the prewar period from 1911-1915 to 1936-1940 and was 8 0 percent annually in the period from 1951-1955 to 1956-1960. The growth rates of national income and capital accumulation were roughly the same through the entire period, indicating an approximately constant capital-output ratio. Net real capital outflow from agriculture increased at a rate of 3.8 percent annually in the prewar period from 1911-1915 to 1936-1940 and decreased at 10 percent rate annually in the period from 1951-1955 to 1956-1960, as shown in Table 2. Considering the facts of the increase in export surplus in the prewar period and of the decrease in the postwar period, net real capital outflow from agriculture had different ways of contributing to the national economy Under the Japanese colonial system, though an inflow of private capital and government financing from Japan had occurred, the amount of capital transfer from Taiwan to Japan through export surplus was still remarkable This implies that Taiwan's agriculture had contributed not only to the industrial development in Taiwan, but also to the industrial development in Japan In the postwar period, as we will analyze it in detail later, the contribution of real visible capital flow from agriculture to total capital formation was not large, but the real invisible capital outflow was large The squeeze on agriculture through the low agricultural price policy was obviously great.

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1. See the theoretical treatments in such articles as R. Nurkse, W. A. Lewis, John C. H. Fei and G. Ranis.

Table 3. Economic indicators in relation to the impact of net real capital outflow from agriculture on economic development, Taiwan, 1911-1960

unit: at constant price T$ 1,000 of 1935-37 period

Items	1911-15	1916-20	1921-25	1926-30	1931-35	1936-40	1951-55	1956-60
Net domestic product at factor cost	293,660	336,547	399,143	560,175	706,218	796,749	795,157	1,119,337
Capital formation	29,316[1/]	30,568	34,521	52,317	76,269	88,793	150,661	241,881
Exports	105,656	143,063	177,304	248,724	314,512	377,358	73,749	128,262
Import	95,121	102,015	117,773	184,132	223,613	287,654	75,906	129,939
Export surplus (Δ=import surplus)	10,535	41,047	59,531	64,592	90,898	89,704	Δ 2,157	Δ 1,677
Industrial prod. index	18.42[2/]	31.90	40.97	64.11	82.11	115.60	94.66	159.08
Labor productivity of industry	569	828	676	867	1.031	1.091	807	1.089
Labor force in industry(1,000 persons)	138	153	162	172	203	247	273	341
Total population (1,000 persons)	3,486	3,677	3,981	4,449	5,061	5,756	8,452	10,069
Percent of domestic food consumption in production	84.24	79.93	77.20	72.41	62.41	58.46	94.08	94.62
Share of labor income in industry	47.23	36.25	41.71	37.12	35.75	20.91	40.76	35.97
General price index	61.67	112.20	115.99	101.74	86.77	132.81	2,201.62	3,422.50
Wage rate in industry	0.71	0.90	0.74	0.86	0.99	0.60	0.74	0.77
Net real capital outflow	50,371	62,173	58,720	59,272	88,447	91,022	116,176	95,406
Visible outflow	40,680	45,340	48,493	59,214	77,666	85,908	67,110	36,610
Invisible outflow	9,691	16,833	10,227	58	781	5,114	49,066	58,796

1/ 2/ The 1911 figure is not available. Source: See Appendix Table 6.

Industrial production increased quite rapidly through the whole period. Of total industrial products, agricultural processing products represent about 60 to 80 percent during the whole period. Increase in sale of agricultural products to the nonagricultural sector would be a direct contribution of agriculture to industries. Sale of agricultural products to the nonfarm household and invisible outflow of real capital would benefit industrialist and industrial workers by supplying cheap sources of raw materials and wages. The contribution of the agriculture sector in this aspect was significant in the early period of the prewar stage in the whole postwar period. The wage rate changed within a limited range so that the share of labor income showed an inverse trend with the wage rate The important fact is that the wage rate has not increased parallel to the increase in labor productivity in industry.

Increase in the labor force of industry lagged far behind the increase in total population. Despite this fact, the percentage of domestic food consumption of total food production declined from 84 2 percent in 1911-1915 to 58.46 percent in 1936-1940 and climbed to 94 percent in the postwar period. The general price level was maintained with only a slight increase in the prewar period compared with the rapid inflationary trend of the postwar period

Chapter 5

Conclusions Concerning the Taiwan Experience in Intersectoral Capital Flows

Conclusions regarding the empirical examinations of Taiwan's experience may be summarized as follows.

(1) The direction of intersectoral net capital flow was identified as outflow from the agricultural sector in Taiwan through the whole period under review. The amount of net capital outflow roughly showed an increasing trend in terms of real price, but recently it tended toward a declining trend. Invisible net real capital outflow caused by the terms of trade against agriculture was less important in the prewar period and increased in relative importance more than 50 percent of the total net real capital outflow in the postwar period. Financially, current transfers of land-rent payment and government taxing occupied the most important role in the financial accommodation of net agricultural surplus in the prewar period, and the direct capital transfer of farmers' savings became increasingly important in the postwar period.

(2) The size of the intersectoral capital flows is dependent in part on the changes of the terms of trade, but in significant part of the physical and financial measures by which development can be achieved. The following measures and conditions would attribute to the above specific characteristics of intersectoral capital out flow in Taiwan.

(a) Not only was the inherited system of agricultural squeeze never abolished under the Japanese administration, but also in addition a new system of government taxes and levies was imposed. After the land reform program in the postwar period, government taxing and levies by means of both direct and hidden methods have been strengthened.

(b) Despite the above high gross squeeze on the agricultural sector, in the earlier period of development, increase in agricultural productivity in terms of land or labor did not slow down. After transformation of the traditional agriculture in the period 1926-1930, increase in agricultural productivity was accelerated. The initial condition of resource endowment and the level of agricultural productivity in Taiwan in the period 1895 were not favorable compared with those in countries presently developing. However, the successful transformation of traditional agriculture could be accomplished while maintaining a continuous net outflow of capital from the agricultural sector. A heavy investment in irrigation was initiated in the transformation period but it did not bring with it a net inflow of capital from the nonagricultural sector. This is the aspect in the story of agricultural development in which economists are mostly interested, we will discuss it in respect to the role of government and technological progress in agriculture in the next section.

(3) In relation to the conventional viewpoints relative to the net capital

outflow from the agricultural sector, we tested those hypotheses by means of Taiwan's experience. The empirical tests showed that Taiwan's experience departed appreciably in the following points:

(a) Taiwan has maintained a continuous outflow of net capital from the agricultural sector under the high growth rate of agricultural population and labor force. This fact disproves the broadly held viewpoint that decelerating the rate of population growth is a necessary condition for accelerating the agricultural surplus.

(b) Agricultural wage rate or per capita consumption of farmers has been improved through time at a slow rate, despite the increase of population in agriculture. However, share of labor income has tended to decline relatively in comparison with that in the nonagricultural sector. This means that the relative decline of a share of labor income in agriculture will be a more important concept than that of constant institutional wage rate in agriculture in relation to the net capital outflow from the agricultural sector.

(c) To transform the traditional agriculture in the paddy farming areas, heavy investment in irrigation is one of the necessary conditions. Capital-use innovation has been witnessed in the period of transformation of traditional agriculture. This departs from the conventional viewpoint of complementary relation between capital and labor in agricultural innovation

(d) With respect to the amount of net capital outflow, that the concept of "net agricultural savings" will not be appropriate is clearly understood from our exposition and the statistical comparison in the text.

(e) The financial accommodation of net agricultural surplus will be one of the important conditions toward determining the magnitudes of net capital outflow from the agricultural sector. The problem of intersectoral capital flow may be better discussed from the aspects of financial accommodation and the commodity transferring process as well as that of the increase in agricultural productivity.

(4) In conclusion, Agricultural development is primarily concerned with the feasibility of increasing net agricultural surplus or net capital outflow from the agricultural sector. In less developed countries like Taiwan, mobilization of internal capital must depend on the agricultural development. How to develop agriculture and to squeeze agriculture will be deeply related to government strategies for agricultural development.

Strategic Measures for Agricultural Development and Capital Transfer

In relation to the intersectoral capital outflow from agriculture, three important government measures toward agricultural development can be derived from our previous analyses; (a) allocation of capital to agriculture, (b) strategy for technological progress, (c) taxing agriculture and organizational improvements. The weight of their comparative importance in the different phases of agricultural development may be summarized as follows:

(1) In the initial period of agricultural development, 1895-1930.
In view of the initial conditions for agricultural development in 1896-1900, net outflow of capital from agriculture was positive even under low land

productivity, low average crop yield, and unfavorable man-land ratio. Population increased at the slow rate of 1 percent annually. Per capita food consumption of agricultural products in total farm income was around 65 to 70 percent including self-produced food as well as purchased food. High squeeze ratio of land-rent payment was the most important mechanism in transferring capital out of agriculture, government taxing did not play a very important role. Efforts for agricultural development started around 1898. Material input and institutional organizations were the most important means. The institutional reform was placed on land tenure system, land registering system, farmers' organizations, administration system, agricultural experimental stations, and agricultural education. Material inputs were put in survey, inventory, and investment in basic resources.

The ten-year Indica rice improvement program, the government control of the irrigation system, the introduction of a new variety of sugarcane, and the subsidy on chemical fertilizer were the important activities Capital investment was made at moderate rate in the earlier period, 1900-1920. Government taxing increased rapidly through land survey and registration. Land-rent payment also increased moderately according to the slow increase in crop yield Increase in land productivity in the earlier period lagged behind the increase in labor productivity. Neither a big push in agricultural productivity nor heavy investment were seen in this earlier period. Net capital outflow from agriculture continued at the positive amount. A transformation in traditional agriculture was not completed but was still on the way until 1920.

From 1918 until after the First World War, the need of more rice and sugar in the Japanese market preconditioned government behavior in pushing a rapid increase in rice and sugar production. Internally, the man-land ratio became worse and a big push of land productivity was necessary. Two objective conditions were determinants for the government's big investment push in this decade; financial possibility and technological feasibility Government budget showed a surplus and the landlord class financially supported the government's heavy investment in irrigation and land improvement. Technically, the new variety of Ponlai rice was expected to be a success and chemical fertilizer was also adopted by farmers Under such conditions, a big investment push in irrigation and land improvement could be expected to be fruitful. Transformation in traditional agriculture was completed in this decade. More than 50,000 hectares of Tao-yien canal irrigation area and 150,000 hectares of Chia-nan irrigation area were completed in 1925 and 1930. A rapid increase in consumption of chemical fertilizer also started in this period. The ratio of total capital goods allocated to agriculture in the decade 1920-1930 was about 14.5 percent on the average, marking an historical record. As the result of heavy investment in irrigation in this decade, the irrigation ratio of total farm land increased to 53 percent, land productivity increased by two times, and the total sale ratio of agricultural products reached to about 70 percent. In financing such heavy investments, landlords and farmers still played an important role. They shared a large percent of their additional income with investment. Favorable terms of trade for agriculture and high technological profitability provided incentives for their participation in investment.

High government taxing of agriculture, increases in land-rent, and farmers' autonomous savings were factors in maintaining a positive net capital outflow from agriculture. In terms of economic relations it can be interpreted as follows: (a) high squeeze ratio including taxing and land-rent payment in total agricultural production; (b) slow increase in per capita consumption of farmers, (c) moderate rate of population increase in agriculture; (d) rapid growth of agricultural exports, (e) high technological change and investment multiplier.

These five factors simultaneously worked together to cancel the adverse effect on capital transfer of the high rate of capital allocation in agriculture. The organized financial transfer mechanism was the condition for the effective working of the above five factors.

(2) The transformation of agriculture and industrialization in the period 1930-1940.

In this period, the rate of capital growth was negative for agriculture and the ratio of capital goods allocated in agriculture also declined rapidly to about 5-6 percent. Following the successful transformation of traditional agriculture in the later phase of the first period, growth of agricultural land productivity still was at the high rate of 1.9 percent per annum. The technological change amounted to 1.5 percent a year. Rapid increase in the application of chemical fertilizer was accompanied by varieties of seeds. More inputs of working capital and labor were represented by the specific character of technological linkage effect on output in this period. Market-price mechanism and technological profitability acted as persuasive incentives to farmers. Small-scale farming together with organizational help made possible the adoption of the new technology at rapid rate. Autonomous growth in agriculture was systematically established in such a way that the abundant resourses of labor and scarce capital funds have well been combined with specific techniques to increase output and to contribute to industrial expansion. Agricultural development in this period constituted not merely the supply of agricultural output and productive resources for industry but also the need for maintaining the momentum of its economic transformation and the use of its scarce resources in two sectors. Net capital outflow from agriculture reached to an historical peak in terms of visible fund. Increases in net savings and government taxing were the dominant factors. Land-rent payment slowed down its increase. High sale ratio of agricultural products marked the successful achievement of agricultural transformation. Also, the system of taxation and financial institutions worked effectively in mobilizing capital out of agriculture.

Therefore, we can summarize the factors contributing a bulk of capital outflow from agriculture in this period as follows: (a) high technological progress with more inputs of working capital and labor; (b) decrease in fixed capital goods allocated to agriculture; (c) relatively slow increase in land-rent payment; (d) the lagging of increase in per capita consumption of farmers behind increase in per capita income, (e) favorable terms of trade for agriculture; (f) continuously rapid increase in agricultural exports. These factors working together with the organized institutional system displayed the role of agriculture in contributing capital to economic development.

(3) Further development of agriculture in the period 1950-1960.
The basic conditions for agricultural development looked gloomy in the immediate postwar period. Population increased at more than 3.0 percent while farm land area was nearly limited in its expansion. Total agricultural output was set back to the 1910 level, mostly because of the shortage of chemical fertilizer and war damage in irrigation facilities. Taiwan suddenly changed from a food surplus area to a food shortage area during the six years between 1942 and 1947. When Taiwan was ceded to China, the most important property was the large number of technically-educated farmers and agricultural organizations. The precondition for government action on choice of development measures was enough Only if government behavior is purposeful and progress-oriented, a quick recovery and further development of agriculture offers no difficulty. Until 1948, the requirements for forcing the government toward purposeful behavior were not satisfactory. Since the National Government came to power in Taiwan the Taiwan government has initiated purposeful development measures. Institutional reforms, represented by the land reform program and the reorganization of farmers' associations, first of all were in practice forced in order to create a productive incentive for farmers. Second, scarce materials imported by the U.S. economic aid were allocated to agriculture and industry under the national development plan. Third, the highly developed technology was transmitted to farmers' level through the role of the Joint Commission on Rural Reconstruction.

Price mechanism was not considered as incentive toward adopting the new technology and increasing the agricultural output Government allocation of chemical fertilizer, pesticides, irrigation water, and production fund to individual farmers plus subsidy comprised important means substituted for the price mechanism Government collection of rice, sugar, and other important products in addition to the unfavorable terms of trade resulted in a tremendous net capital outflow from agriculture. The forced savings for land price repayment and autonomous savings of farmers were other factors influencing the increase in capital outflow.

In summary, the factors determining the capital outflow from agriculture in this period can be weighed as follows. (a) total output of agriculture increased rapidly at more than 4.0 percent per annum, of which technological change was as high as 2.0 percent. This growth rate far exceeded the population growth rate in addition to increasing the rate of per capita consumption, (b) in the rapid industrialization at more than 17 percent per annum in this period, the wage rate in industry was two times higher than in agriculture. The great requirement for food in industry plus export demand constituted the great demand potential for agricultural products, (c) capital-output ratio in agriculture increased to some extent in this period but still was less than capital-output ratio in the nonagricultural sector, (d) investment in agriculture in this period was accompanied by the large multiplier effect, although the ratio of capital goods allocated in agriculture was only about 5 percent, (e) government taxing, forced savings on agriculture, and farmers' autonomous savings constituted a large squeeze ratio of agriculture. However, invisible capital transfer occupied more than 50 percent of total net real capital transfer from agriculture throughout the period.

After all, the rapid technological change of agriculture and high squeeze ratio of the government's direct and hidden taxing of agriculture outweighed

the capital and industrial consumer goods flowing into the agricultural sector. The role of landlords in capital transfer mechanism ceased in this period.

Implications of Taiwan's Experience

In considering the implications of the above discussion, it seems to be important to generalize the relationship between determinants of intersectoral capital flow with respect to the strategic measures for agricultural development. The resource endowment and the level of agricultural productivity are the conditions determining the size of agricultural investment for achieving the given rate of agricultural growth. Fundamentally, land productivity and per capita land area or man-land ratio are the determinants of the level of agricultural productivity in terms of labor. Therefore, under the great increase in population and limited land resource, the large requirement for food supply necessarily requires a big push of agricultural investment in irrigation and land improvement. For this reason, Shigeru Ishikawa and V. W. Ruttan have concluded in reference to the intersectoral capital transfer that the agricultural sector may require a net inflow of capital from the nonagricultural sector for the transformation of agriculture in Asia.[1] A similar situation does not seem likely in the case of Taiwan's experience. A big push of agricultural investments in irrigation and land improvement had not been undertaken in Taiwan before the surplus of government budget and the technological progress were realized Two important strategies will be observed, (a) purposeful government decision; and (b) technological relation between the fixed capital input and biological technology. The former is related to the basic problem of capital allocation in the whole national economy. As agriculture is generally considered the mainstay of the economy, the better utilization of slack in agriculture will be rather selected to substitute for the additional input of scarce capital fund. The latter is concerned with the availability of new varieties of seeds, with the farmers' skill in application of chemical fertilizer and with the method of cultivation in relation to the heavy irrigation investment. The requirement for heavy irrigation investment seems to be large in the period of transition from extensive to intensive farming in paddy farming areas. Under the high pressure of population, labor intensive cultivation is the general direction. To absorb more labor input in farming, the expansion of productive capacity in terms of land is naturally the due measure However, the intensity of farming is greatly dependent on the demand for crops and livestock and also on the quantitative and qualitative relationships between inputs. Landowners, as receivers of large shares of land-rent in the additional increase of output, will play some role in encouraging such intensive farming. Introducing new varieties of seeds and promoting the application of more chemical fertilizer and contributing to the irrigation investment represented their efforts in Taiwan experience.

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1. Shigeru Ishikawa, Economic Development in Asian Perspective, Kinokuniya, Tokyo, Japan, 1967, pp. 346-347
   V. W. Ruttan, Considerations in the Design of a Strategy for Increasing Rice Production in South East Asia, paper prepared for presentation at the Pacific Science Congress on Modernization of Rural Area, Tokyo, August 27, 1966.

Considering the fact that a requirement for heavy investment in agriculture is generally associated with government decision, technological requirement, role of landlords, and demand factors, the amount of capital flow into the agricultural sector probably will not exceed the gross capital outflow from agriculture by the effective capital transfer mechanism and the large multiplier investment schemes. As pointed out previously, a special case of net capital inflow to agriculture will be seen only if the share of labor income or the per capita consumption in the non-agricultural sector is lower than that in the agricultural sector under the assumptions that agriculture shares more than 60 percent of total population and total national products and capital transfer mechanism is established. Even if there is a net capital inflow to agriculture, in the short run the case will quickly turn to the net capital outflow.

Strategies for agricultural transformation with respect to maintaining the net capital outflow from agriculture are, (a) that the basic agricultural investment should be accompanied by technological improvement, (b) than an appropriate investment scheme with large multiplying effect be selected, and (c) that a capital transfer mechanism be established. According to the different conditions or stages of agricultural development, the above strategic components will change in comparative importance, as the experience of Taiwan has shown.

When we carefully study the problems of agricultural development faced by the countries contemporarily developing in Southeast Asia, it is clear that they suffer from an inability to transform the traditional agriculture and bring about the major, continuous change in productivity associated with a technologically dynamic agriculture. The crucial fact is that, as Mellor has pointed out, introduction of single change in farming practice in such a traditional agriculture will result in a small effect on increase in productivity.[1] The several empirical studies on the Southeast Asian agriculture indicate that, within the traditional agriculture, increasing agricultural production or crop yield through added labor input seems unlikely to succeed.[2] Considering the available land resources and high population pressure in the contemporary Southeast Asian countries, the possible pattern of land-man ratio in these areas will continue to enlarge or may decrease in the future. The above-mentioned development strategies for transforming the traditional agriculture in 1926-1930 in Taiwan may be useful for these areas. This suggestion is, of course, subject to severe qualification by the institutional organizational requirements for achieving development strategies. The successful case of agricultural transformation with respect to the maintaining of the net capital outflow from agriculture in Taiwan will be better fitted in the eyes of the people of the Southeast Asian countries into their heritage of institutional organizational system.

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1. John W. Mellor, The Economics of Agricultural Development, Cornell University Press, 1966, pp. 214-219.

2. John W. Mellor, ibid., 136-154.

TABLE 1.

SHEET OF AGRICULTURAL PRODUCTION

Unit OT $ for 1911 - 1940
NT $ for 1950 - 1960

Accounts	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Receipts from										
1 Agricultural production	11,117,700	12,180,205	10,259,619	7,718,720	7,585,479	14,308,685	18,611,817	38,657,680	24,535,173	24,911,186
a Agricultural products for intermediate goods	9,601,140	10,772,205	9,735,619	7,718,720	6,153,479	7,034,685	11,953,817	18,757,680	23,188,173	19,572,186
b Incremental value of capital	1,516,560	1,408,000	524,000	---	1,432,000	7,274,000	6,658,000	19,900,000	1,347,000	5,339,000
2 Non-agricultural production	27,926,773	26,575,344	24,475,471	27,259,166	32,081,433	37,998,873	50,094,157	57,304,774	66,964,918	67,154,760
3 Farm household	33,078,406	39,757,750	37,562,027	29,611,899	23,779,204	27,477,988	40,994,940	63,507,499	85,785,081	72,647,028
4 Non-farm household	19,367,229	15,784,469	22,626,107	17,991,694	13,495,756	14,827,749	23,042,607	25,343,794	39,871,126	44,945,822
5 Public finance (subsidy)	3,393,730	761,524	529,262	451,924	411,397	412,542	364,010	392,490	394,751	404,454
6 Exports (directly)	8,013,634	9,525,480	15,146,241	6,376,363	7,496,126	8,596,165	12,235,265	23,728,337	35,871,126	19,420,108
Total	102,897,472	104,584,772	110,598,727	89,409,786	84,849,395	103,622,002	145,342,796	208,934,574	253,422,175	229,483,358
Expenditure on										
1 Agricultural production	10,796,394	11,434,393	10,300,968	8,308,806	6,769,915	7,906,985	13,157,794	20,352,282	25,754,320	22,370,733
a Agricultural products for intermediate goods	9,601,140	10,772,205	9,735,619	7,718,720	6,153,479	7,304,685	11,953,817	18,757,680	23,188,173	19,572,186
b Depreciation	595,254	662,188	565,349	590,086	616,436	872,300	1,203,977	1,594,602	2,566,147	2,798,547
2 Non-agricultural production	3,497,442	5,409,000	5,674,146	5,914,851	7,029,754	9,760,565	14,243,628	16,277,263	24,012,181	21,746,333
a Feeds	2,164,454	2,851,307	2,748,820	2,769,984	2,406,346	3,299,733	5,156,451	6,707,877	10,077,844	10,493,091
b Chemical fertilizer	1,267,211	2,386,405	2,659,796	2,775,895	4,753,750	5,856,713	8,349,975	8,708,751	12,879,272	10,102,316
c Farming tools and implements	41,358	49,630	37,912	44,115	47,562	84,784	120,628	146,822	244,013	242,635
d Miscellaneous exports	24,419	121,658	227,618	324,857	422,096	519,335	616,574	713,813	811,052	906,291
3 Farm household	55,681,383	58,915,054	63 611,732	49,586,362	47,359,369	58,419,716	79,596,451	118,380,434	131,887,109	118,639,137
a */ Unpaid wage for family labor)										
b Wage payment)	33,355,277	35,633,606	39,013,197	28,868,586	27,658,664	37,385,942	48,050,031	73,815,951	68,291,652	61,613,101
c Rent for owned-land	13,894,117	14,772,928	16,252,045	12,692,616	11,515,364	13,581,228	21,122,949	31,225,029	42,736,998	37,264,415
d Inputed capital interest	8,431,710	8,508,520	8,346,490	8,025,160	8,185,341	7,452,546	10,423,471	13,339,454	20,858,459	19,761,621
4 Non-farm household	27,513,628	22,627,407	24,836,677	19,478,530	16,721,357	20,781,902	30,973,064	45,669,658	62,651,367	54,173,779
a Interest paid	460,489	468,014	458,609	439,605	448,312	410,061	576,625	736,079	1,151,784	1,644,424
b Land rent paid	27,052,628	22,159,393	24,378,068	19,038,925	16,273,045	20,371,841	30,396,439	44,933,579	61,499,583	52,529,355
5 Public finance	6,009,136	6,198,918	6,175,204	6,121,237	6,369,000	6,752,834	7,371,859	8,254,937	9,117,198	12,553,376
a Tax	4,993,291	5,015,966	4,975,153	4,943,504	5,103,409	5,244,057	5,400,200	5,565,093	5,804,020	8,077,570
b FA fee	---	---	---	---	---	---	---	---	---	595,584
c Water fee	1,015,845	1,182,952	1,200,051	1,177,733	1,265,591	1,508,777	1,971,659	2,689,844	3,313,178	3,880,222
Total	102,897,472	104,584,772	110,598,727	89,409,786	84,849,395	103,622,002	145,342,796	208,934,574	253,422,175	229,483,358

*/ Unpaid wage for family labor is inputed as residual of receipts subtracting all other expenditures except the item of wage for family labor

TABLE 1

SHEET OF AGRICULTURAL PRODUCTION (cont)

Unit OT $ for 1911 - 1940
NT $ for 1950 - 1960

Accounts	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Receipts from										
1 Agricultural production	20,802,440	18,703,519	25,043,129	27,993,321	31,481,171	29,135,920	22,615,891	29,548,442	30,244,169	17,150,970
a Agricultural products for intermediate goods	15,293,440	13,703,519	14,206,129	16,454,321	19,895,171	19,895,920	18,126,891	20,197,442	22,950,169	17,150,970
b Incremental value of capital	5,509,000	5,000,000	10,837,000	11,539,000	11,586,000	9,240,000	4,489,000	9,351,000	7,294,000	---
2 Non-agricultural production	74,649,107	71,353,292	68,827,592	78,429,959	96,179,948	100,343,827	93,928,275	106,878,060	119,303,60[illegible]	108,744,416
3 Farm household	58,454,364	49,784,950	56,873,728	68,927,449	81,334,273	77,295,174	67,072,529	67,966,189	69,017,023	53,403,996
4 Non-farm household	36,371,161	41,427,856	30,780,445	48,216,900	47,739,729	44,185,969	44,260,550	52,327,744	46,794,663	49,974,347
5 Public finance (subsidy)	440,108	390,326	405,345	415,149	354,173	282,834	231,498	282,639	353,509	476,246
6 Exports (directly)	21,245,798	14,671,893	27,246,167	46,470,683	69,513,734	56,072,107	56,072,250	53,491,576	51,092,573	36,876,290
Total	211,962,978	196,331,836	209,176,406	270,453,461	326,603,028	307,315,831	284,180,993	310,494,650	316,805,542	266,626,265
Expenditure on										
1 Agricultural production	17,873,547	16,799,599	17,586,495	20,660,618	24,506,613	27,540,992	27,693,830	26,831,511	28,848,609	23,780,730
a Agricultural products for intermediate goods	15,293,440	13,703,519	14,206,129	16,454,321	19,895,171	19,895,920	18,126,891	20,197,442	22,950,169	17,150,970
b Depreciation	2,580,107	3,096,080	3,380,366	4,206,297	4,611,442	7,645,072	9,566,939	6,634,069	5,898,440	6,629,760
2 Non-agricultural production	19,537,382	22,513,710	24,795,644	34,774,675	42,044,331	44,703,289	47,003,065	46,915,247	47,545,566	40,516,352
a Feeds	6,286,033	7,286,985	7,138,094	11,465,274	15,420,414	13,651,739	14,025,009	14,585,781	16,991,031	13,762,816
b Chemical fertilizer	10,026,949	11,235,771	13,224,015	17,849,456	20 651,052	21,667,217	21,718,153	24,626,582	23,868,913	19,749,638
c Farming tools and implements	2,218,870	2,888,184	3,233,526	4,182,697	4,578,358	7,966,977	10,105,887	6,791,712	6,024,518	5,356,761
d Miscellaneous exports	1,005,530	1,102,770	1,200,009	1,297,248	3,394,487	1,417,356	1,154,016	911,172	661,104	647,737
3 Farm household	111,996,222	97,523,290	107,285,340	143,409,471	178,830,273	159,461,656	141,868,065	159,293,540	158,431,362	128,668,916
a */ Unpaid wage for family labor)	62,765,437	50,462,159	57,992,364	82,714,449	108,628,831	96,893,776	73,511,802	87,489,078	85,586,454	63,633,565
b Wage payment)	32,585,816	30,703,842	30,959,330	39,605,339	46,959,182	42,368,330	39,318,363	46,619,701	49,807 224	46,096,670
c Rent for owned-land	16,644,969	16,357,289	18,333,646	21,089,683	23,242,260	20,199,550	29,037,900	25,184,761	23,037,684	18,939,681
d Imputed capital interest	47,386,056	44,187,857	44,300,475	56,401,630	66,677,398	60,703,502	51,784,280	61,261,288	65,209,089	57,403,577
4 Non-farm household	1,451,834	1,437,531	1,547,115	1,708,543	1,829,003	2,194,856	2,129,273	1,927,123	1,818,076	1,063,202
a Interest paid	45,934,222	42,750,326	42,753,360	54,693 087	64,848,395	58,508,646	49,655,007	59,334,165	63,391,013	56,340,375
b Land rent paid	15,169,771	15,307,380	15,208,452	15,187,067	14,544,433	14,906,302	15,831,753	16,193,064	16,770,916	16,256,090
5 Public finance	11,428,900	11,498,721	11,129,656	10,985,986	10,178,168	10,510,763	11,401,263	11,768,509	12,008,279	11,895,952
a Tax	673,164	692,082	955,432	980,709	989,657	999,114	1,044,745	1,065,398	1,082,400	1,055,306
b FA fee	3,067,707	3,116,577	3,123,364	3,220,372	3,376,608	3,396,515	3,385,745	3,359,157	3,680,237	3,304,832
c Water fee										
Total	211,962,978	196,331,836	209,176,406	270,453,461	326,603,028	307,315,831	284,180,993	310,494,650	316,805,542	266,626,265

*/ Unpaid wage for family labor is inputed as residual of receipts subtracting all other expenditures except the item of wage for family labor

TABLE 1

SHEET OF AGRICULTURAL PRODUCTION (cont)

Unit OT $ for 1911 - 1940
NT $ for 1950 - 1960

Accounts	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Receipts from										
1 Agricultural production	12,055,376	31,366,497	18,764,385	35,093,588	22,008,053	40,070,339	40,622,664	37,418,871	67,608,597	67,643,354
a Agricultural products for intermediate goods	12,055,376	16,856,497	16,793,385	18,340,588	22,008,053	23,429,339	23,189,664	25,160,871	32,990,597	31,211,354
b Incremental value of capital	---	14,510,000	1,971,000	16,753,000	---	16,641,000	17,433,000	12,258,000	34,618,000	36,432,000
2 Non-agricultural production	89,004,606	100,587,875	66,959,385	77,058,199	107,825,706	112,854,351	129,012,788	148,229,884	212 884,218	215,051,190
3 Farm household	43,070,230	55,875,038	53,074,097	63,262,356	76,065,758	81,628,345	82,829,070	90,035,980	102,794,882	115,618,516
4 Non-farm household	37,650,582	58,439,663	40,865,906	43,697,753	61,124,511	66,985,663	60,415,034	80,758,747	96,204,544	104,924,634
5 Public finance (subsidy)	478,364	297,145	213,645	160,807	98,673	180,235	139,069	322,068	2,785,274	3,000,000
6 Exports (directly)	34,672,852	54,028,349	67,502,079	98,840,690	104,091,683	114,908,500	120,264,978	130,450,207	123,224,267	96,202,468
Total	216,932,010	300,594,507	247,379,497	318,113,373	371,214,384	416,627,433	433,283,603	487,215,757	605,501,782	602,440,162
Expenditure on										
1 Agricultural production	18,155,420	23,155,775	23,264,326	25,294,764	30,250,404	32,260,464	31,294,607	33,821,496	42,940,308	41,968,613
a Agricultural products for intermediate goods	12,055,376	16,856,497	16,793,385	18,340,588	22,008,053	23,429,339	23,189,664	25,160,871	32,990,597	31,211,354
b Depreciation	6,100,044	6,299,278	6,470,941	6,954,176	8,242,351	8,831,125	8,104,943	8,660,625	9,949,711	10,757,259
2 Non-agricultural production	33,999,799	47,387,087	43,910,779	51,000,742	59,968,035	72,552,580	72,780,490	77,321,310	90,322,184	99,056,601
a Feeds	9,343,586	17,951,785	15,189,641	17,555,415	18,733,932	23,698,909	22,221,508	19,065,255	22,905,301	17,847,901
b Chemical fertilizer	18,196,397	21,524,734	21,529,851	25,731,916	33,312,285	40,513,284	42,723,016	49,720,922	57,808,302	68,543,283
c Farming tools and implements	5,832,891	6,187,883	6,385,713	6,814,460	6,803,041	7,324,791	6,802,502	7,298,702	8,255,313	11,338,808
d Miscellaneous exports	606,925	722,685	805,574	898,951	1,028,777	1,015,596	1,033,464	1,236,431	1,353,268	1,326,609
3 Farm household	106,854,500	162,284,145	115,037,701	164,523,714	186,081,324	213,087,825	220,714,897	250,118,461	322,785,211	301,830,965
a */ Unpaid wage for family labor)										
b Wage payment)	55,576,255	102,745,748	58,889,323	94,657,244	104,573,834	133,745,841	139,050,917	156,281,529	216,969,335	187,603,967
c Rent for owned-land	34,922,177	44,228,758	40,548,226	50,040,745	62,640,114	61,746,840	64,257,364	74,710,229	89,997,167	91,975,565
d Inputed capital interest	16,356,072	15,309,639	15,600,152	19,825,725	18,867,376	17,595,144	17 406,616	19,126,703	15,818,709	22,251,433
4 Non-farm household	41,911,203	52,777,184	48,478,810	59,866,329	76,106,624	76,479,589	81,188,673	96,233,399	116,874,161	120,718,331
a Interest paid	915,608	856,469	878,718	1,122,846	1,076,157	1,011,228	1,047,467	1,147,652	928,154	1,255,816
b Land rent paid	40,995,595	51,920,715	47,600,092	58,743,483	75,030 467	75,468,361	80,141,206	95,085,747	115,946,007	119,462,515
5 Public finance	16,011,088	15,990,316	16,687,881	17,427,824	18,807,997	22,246,975	27,304,936	29,721,091	32,579,918	38,865,652
a Tax	11,921,276	11,888,190	12,158,248	12,672,535	13,853,394	16,822,591	20,628,619	22,055,580	23,716,802	27,883,375
b FA fee	1,065,568	1,014,920	1,170,361	1,229,431	1,330,920	1,518,131	2,031,683	2,136,062	2,465,298	3,722,575
c Water fee	3,024,244	3,087,206	3,359,272	3,525,858	3,623,683	3,906,253	4,644,634	5,529,449	6,397,818	7,259,702
Total	216,932,010	300,594,507	247,379,497	318,113,373	371,214,384	416,627,433	433,283,603	487,215,757	605,501,782	602,440,162

*/ Unpaid wage for family labor is inputed as residual of receipts subtracting all other expenditures except the item of wage for family labor

TABLE 1. SHEET OF AGRICULTURAL PRODUCTION (cont)

Unit OT $ for 1911 - 1940
NT $ for 1950 - 1960

Accounts	1950	1951	1952	1953	1954	1955
Receipts from						
1 Agricultural production	485,600,525	603,758,660	818,689,165	1,146,297,033	1,545,451,134	2,184,867,696
a Agricultural products for intermediate goods	204,134,022	323,758,660	585,246,165	810,108,033	788,485,134	950,866,696
b Incremental value of capital	281,466,503	280,000,000	232,443,000	336,189,000	756,966,000	1,234,001,000
2 Non-agricultural production	870,613,521	1,387,067,636	1,666,093,499	2,643,120,807	2,313,256,716	3,198,112,531
3 Farm household	1,037,937,527	1,083,342,865	1,774,169,931	2,544,019,139	2,170,122,797	2,767,446,907
4 Non-farm household	1,080,127,119	1,199,618,826	1,882,951,233	2,842,882,134	2,245,576,158	2,400,701,460
5 Public finance (subsidy)	1,194,371	917,400	2,755,200	7,146,663	7,671,646	6,129,026
6 Exports (directly)	73,435,995	93,700,293	244,340,832	268,324,284	209,062,056	483,350,239
Total	3,548,909,058	4,368,405,680	6,388,999,860	9,451,790,060	8,491,140,507	11,040,607,859
Expenditure on						
1 Agricultural production	288,286,376	403,575,398	679,197,446	929,589,469	903,730,550	1,082,206,054
a Agricultural products for intermediate goods	204,134,022	323,758,660	586,246,165	810,108,033	788,485,134	950,866,696
b Depreciation	84,152,354	79,816,738	92,951,281	119,481,436	115,245,416	131,339,358
2 Non-agricultural production	496,186,984	509,663,973	840,161,094	1,351,921,899	1,509,339, 0	1,608,222,248
a Feeds	150,624,210	126,742,841	182,824,724	305,462,720	361,827,882	453,234,176
b Chemical fertilizer	250,632,127	268,422,614	535,760,519	903,924,248	985,469,963	947,203,164
c Farming tools and implements	84,041,640	97,755,369	103,634,294	117,326,985	119,008,455	130,535,213
d Miscellaneous exports	10,889,007	16,743,149	17,941,557	25,207,946	43,033,440	74,249,695
3 Farm household	2,112,914,605	2,558,586,848	3,468,715,455	5,588,283,495	4,722,864,248	6,775,261,104
a */ Unpaid wage for family labor)						
b Wage payment)	1,356,072,375	1,573,366,307	2,197,931,800	3,095,763,383	2,623,414,729	4,067,083,040
c Rent for owned-land	540,727,599	663,757,375	941,479,990	1,964,408,296	1,617,369,519	2,174,070,570
d Inputed capital interest	216,114,631	321,463,166	329,303,665	528,11[illegible],816	482,080,000	534,107,494
4 Non-farm household	457,891,186	543,093,446	727,554,773	487,134,226	426,766,422	549,372,094
a Interest paid	82,131,329	100,588,529	121,693,781	140,473,938	141,348,272	150,598,084
b Land rent paid	375,759,857	442,504,917	605,860,992	346,660,288	285,418,150	398,774,010
5 Public finance	193,629,907	353,486,015	673,371,092	1,094,860,971	928,439,547	1,025,546,359
a Tax	149,417,000	280,010,351	580,649,335	984,079,023	816,250,908	895,681,069
b PA fee	---	---	3,410,925	12,329,631	13,029,981	17,545,211
c Water fee	44,212,907	73,475,664	89,310,822	98,452,317	99,158,658	112,320,079
Total	3,548,909,058	4,368,405,680	6,388,999,860	9,451,790,060	8,491,140,507	11,040,607,859

*/ Unpaid wage for family labor is inputed as residual of receipts subtracting all other expenditures except the item of wage for family labor

TABLE 1

SHEET OF AGRICULTURAL PRODUCTION (cont)

Unit OT $ for 1911 - 1940
NT $ for 1950 - 1960

Accounts	1956	1957	1958	1959	1960
Receipts from					
1 Agricultural production	1,143,906,366	2,344,621,460	2,107,842,684	2,897,754,567	3,559,406,990
a Agricultural products for intermediate goods	1,087,458,366	1,264,024,460	1,449,161,684	1,521,186,567	1,999,702,990
b Incremental value of capital	56,448,000	1,080,597,000	658,681,000	1,376,568,000	1,559,704,000
2 Non-agricultural production	3,434,709,985	4,246,209,087	4,653,461,275	5,768,789,349	6,525,075,517
3 Farm household	2,946,585,470	3,329,718,127	3,602,105,594	4,007,935,305	5,878,854,635
4 Non-farm household	3,064,379,020	3,138,954,198	3,824,145,260	4,391,865,102	6,467,077,536
5 Public finance (subsidy)	5,647,800	5,316,650	7,321,300	6,828,429	7,685,600
6 Exports (directly)	344,825,789	832,084,326	652,962,861	511,120,031	467,651,656
Total	10,940,054,430	13,096,903,848	14,847,838,974	17,584,292,783	22,905,751,934
Expenditure on					
1 Agricultural production	1,237,213,834	1,423,444,394	1,619,940,093	1,700,991,401	2,214,641,817
a Agricultural products for intermediate goods	1,087,458,366	1,264,024,460	1,449,161,684	1,521,186,567	1,999,702,990
b Depreciation	149,755,468	159,419,934	170,778,409	179,804,834	214,938,827
2 Non-agricultural production	1,948,234,701	2,162,894,768	2,465,784,055	2,592,096,460	3,802,962,805
a Feeds	566,540,033	590,438,263	694,066,732	711,000,267	1,134,403,985
b Chemical fertilizer	1,159,222,445	1,309,042,839	1,459,524,712	1,540,303,732	2,220,540,201
c Farming tools and implements	146,690,629	160,221,897	170,406,693	172,994,594	189,903,644
d Miscellaneous exports	75,781,594	103,191,769	141,785,918	167,797,867	258,114,975
3 Farm household	6,041,219,827	8,376,286,435	8,738,290,903	11,117,929,289	13,775,492,036
a */ Unpaid wage for family labor	3,122,812,971	5,133,420,765	5,330,991,512	7,085,145,169	8,624,433,400
b Wage payment	2,217,354,156	2,515,678,174	2,757,226,295	3,362,308,362	4,327,170,823
c Rent for owned-land	701,052,700	727,187,496	642,073,096	670,475,758	823,887,813
d Inputed capital interest	584,405,982	623,877,005	664,569,615	810,462,371	1,010,635,409
4 Non-farm household	162,052,809	179,933,798	178,000,269	217,113,837	247,017,028
a Interest paid	422,353,173	443,943,207	486,569,346	593,348,534	763,618,381
b Land rent paid	1,128,980,086	1,310,401,246	1,359,254,308	1,362,813,262	2,102,019,867
5 Public finance	974,758,559	1,135,259,404	1,171,263,976	1,149,843,620	1,849,023,813
a Tax	24,161,490	35,300,249	42,808,753	53,390,863	68,201,384
b FA fee	130,060,037	139,841,593	145,181,579	159,578,779	184,794,670
c Water fee					
Total	10,940,054,430	13,896,903,848	14,847,838,974	17,584,292,783	22,905,751,934

*/ Unpaid wage for family labor is inputed as residual of receipts subtracting all other expenditures except the item of wage for family labor

TABLE 2.

SHEET OF THE FARM HOUSEHOLD'S INCOME AND CONSUMPTION

Unit OT $ for 1911 - 1940
MT $ for 1950 - 1960

Accounts	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Receipts from										
1 Agricultural production	55,681,383	58,915,054	63,611,732	49,586,362	47,359,369	58,419,716	79,596,451	118,380,434	131,887,109	118,639,137
Wage from labor input in agricultural investment	2,575,020	1,601,380	1,335,456	938,666	1,418,383	5,033,614	4,216,222	4,695,881	5,017,165	6,178,713
2 Non-agricultural production	2,586,895	2,509,995	1,367,794	3,339,536	2,194,548	5,605,653	6,303,300	7,782,969	9,966,926	8,905,995
Total	60,843,298	63,027,429	66,314,982	53,864,564	50,972,300	69,058,983	90,115,973	130,859,284	146,871,200	133,723,845
Expenditure on.										
1 Agricultural production	33,078,406	39,757,750	37,562,027	25,611,899	23,779,204	27,477,988	40,994,940	63,507,499	85,785,081	72,647,028
2 Non-agricultural production	24,453,596	21,123,972	27,774,983	23,342,620	24,710,237	27,712,324	37,223,793	43,592,409	56,585,388	53,289,228
3 Surplus to										
Non-agricultural production	200,000	250,000	272,465	240,461	377,967	527,788	1,299,920	1,006,472	1,129,982	481,814
Agricultural production	3,111,296	1,895,707	705,507	669,584	2,104,892	13,340,883	10,597,320	22,752,904	3,370,749	7,305,775
Total	60,843,298	63,027,429	66,314,982	53,864,564	50,972,300	69,058,983	90,115,973	130,859,284	146,871,200	133,723,845

TABLE 2 SHEET OF THE FARM HOUSEHOLD'S INCOME AND CONSUMPTION (cont)

Unit OT $ for 1911 - 1940
NT $ for 1950 - 1960

Accounts	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Receipts from										
1 Agricultural production	111,996,222	97,523,290	107,285,340	143,409,471	178,830,273	159,461,654	141,868,065	159,293,540	158,431,362	128,668,916
Wage from labor input in agricultural investment	6,499,588	9,786,997	15,752,664	14,800,404	12,769,363	12,890,497	17,436,671	21,992,034	14,546,904	13,344,627
2 Non-agricultural production	10,156,706	15,643,673	9,657,681	17,167,191	6,575,561	2,979,431	1,694,904	2,862,279	7,209,226	11,381,067
Total	128,652,516	122,953,960	132,695,685	175,377,066	198,175,197	175,331,582	160,999,640	184,147,853	180,187,492	153,394,610
Expenditure on										
1 Agricultural production	58,454,364	49,784,950	56,873,728	68,927,449	81,334,273	77,295,174	67,072,529	67,966,189	69,017,023	53,403,996
2 Non-agricultural production	60,249,787	56,678,530	52,401,278	75,302,269	93,905,287	81,800,582	77,108,485	92,238,550	92,982,245	88,978,821
3 Surplus to.										
Non-agricultural production	1,017,791	384,862	578,241	1,345,154	1,597,905	492,607	1,159,496	1,231,805	956,271	---
Agricultural production	8,980,574	16,105,618	22,842,438	29,802,194	21,337,732	15,743,219	15,659,130	22,711,309	17,231,953	11,011,793
Total	128,652,516	122,953,960	132,695,685	175,377,066	198,175,197	175,331,582	160,999,640	184,147,853	180,187,492	153,394,610

TABLE 2 SHEET OF THE FARM HOUSEHOLD'S INCOME AND CONSUMPTION (cont)

Unit OT $ for 1911 - 1940
NT $ for 1950 - 1960

Accounts	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Receipts from										
1 Agricultural production	106,854,500	162,285,145	115,037,701	164,523,714	186,081,324	213,087,825	220,714,897	250,118,461	322,785,211	301,830,965
Wage from labor input in agricultural investment	9,428,152	6,454,367	4,874,949	8,430,350	16,635,372	8,736,366	12,562,918	6,381,957	14,893,499	15,637,058
2 Non-agricultural production	2,549,999	4,314,036	11,995,595	10,801,094	16,047,499	7,511,256	13,730,792	24,797,141	36,753,974	44,936,330
Total	118,832,651	173,053,548	131,908,245	183,755,158	218,764,195	229,335,447	247,008,607	281,297,559	374,432,684	362,404,353
Expenditure on										
1 Agricultural production	43,070,230	55,875,038	53,074,097	63,262,356	76,065,758	81,628,345	82,829,070	90,035,980	102,794,882	115,618,516
2 Non-agricultural production	67,292,937	96,444,019	71,947,452	95,177,717	122,298,873	126,682,422	136,859,801	166,266,191	211,895,124	202,413,859
3 Surplus to										
Non-agricultural production	1,235,877	2,849,180	1,698,690	4,933,569	4,480,488	3,405,926	---	9,886,285	13,676,286	4,908,964
Agricultural production	7,233,607	17,885,311	5,188,006	20,381,516	15,919,076	17,618,754	27,319,736	15,109,103	46,066,392	39,463,014
Total	118,832,651	173,053,548	131,908,245	183,755,158	218,764,195	229,335,447	247,008,607	281,297,559	374,432,684	362,404,353

TABLE 2 SHEET OF THE FARM HOUSEHOLD'S INCOME AND CONSUMPTION (cont)

Unit OT $ for 1911 - 1940
NT $ for 1950 - 1960

Accounts	1950	1951	1952	1953	1954	1955
Receipts from						
1 Agricultural production	2,112,914,605	2,558,586,848	3,468,715,455	5,588,283,495	4,722,864,248	6,775,261,104
Wage from labor input in agricultural investment	116,029,547	147,160,015	94,950,656	116,485,621	77,129,398	415,870,764
2 Non-agricultural production	308,378,714	192,184,650	484,436,252	73,451,401	502,845,186	738,767,614
Total	2,537,322,866	2,897,931,513	4,048,102,363	5,778,220,517	5,302,838,832	7,929,899,482
Expenditure on						
1 Agricultural production	1,037,937,527	1,083,342,865	1,774,169,931	2,544,019,139	2,170,122,797	2,767,446,907
2 Non-agricultural production	1,136,640,387	1,410,360,345	1,984,370,176	2,873,570,527	2,196,725,400	3,046,225,324
3 Surplus to						
Non-agricultural production	5,000,000	12,000,000	18,000,000	20,035,200	231,792,707	275,109,769
Agricultural production	357,744,952	392,228,303	271,562,256	340,595,651	704,197,928	1,841,117,482
Total	2,537,322,866	2,897,931,513	4,048,102,363	5,778,220,517	5,302,838,832	7,929,899,482

TABLE 2

SHEET OF THE FARM HOUSEHOLD'S INCOME AND CONSUMPTION (cont)

Unit OT $ for 1911 - 1940
MT $ for 1950 - 1960

Accounts	1956	1957	1958	1959	1960
Receipts from					
1 Agricultural production	6,041,219,827	8,376,286,435	8,732,290,903	11,117,929,289	13,775,492,036
Wage from labor input in agricultural investment	725,063,808	1,252,431,143	1,629,549,746	1,756,287,719	1,282,774,610
2 Non-agricultural production	1,090,741,786	1,662,080,693	1,898,622,073	1,595,295,506	1,514,132,143
Total	7,857,025,421	11,290,798,271	12,266,462,722	14,469,512,514	16,572,398,789
Expenditure on					
1 Agricultural production	2,946,585,470	3,329,718,127	3,602,105,594	4,007,935,305	5,878,854,635
2 Non-agricultural production	3,367,301,832	4,239,716,312	4,657,208,651	5,694,714,339	6,669,104,399
3 Surplus to					
Non-agricultural production	312,510,478	397,337,826	571,188,864	322,599,089	519,516,372
Agricultural production	1,230,627,641	3,324,026,006	3,435,959,613	4,444,263,781	3,504,923,383
Total	7,857,025,421	11,290,798,271	12,266,462,722	14,469,512,514	16,572,398,789

TABLE 3. SHEET OF AGRICULTURAL SAVINGS AND INVESTMENT

Unit OT $ before 1950
NT $ after 1950

Accounts	911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
Receipts from													
1 Agricultural production (depreciation)	595,254	662,188	565,349	590,086	616,436	872,300	1,203,977	1,594,602	2,566,147	2,798,547	2,580,107	3,096,080	3,380,366
2 Farm household (savings)	3,111,296	1,895,707	705 507	669,584	2,104,892	13,340,883	10,597,320	22,752,904	3,370,749	7,305,775	8,930,574	16,105,618	22,842,438
3 Non-agricultural production & household	310,000	350,000	298,806	250,599	439,846	532,962	1,047,287	1,815,835	2,212,306	989,477	1,194,153	649,248	6,870,370
4 Public finance	911,287	991,415	968,626	---	---	413,732	760,813	696,070	849,889	2,375,211	3,242,107	3,197,341	3,028,419
Total	4,927,837	3,899,310	2,538,288	1,510,269	3,161,174	15,159,877	13,609,397	26,859,411	8,999,091	13,469,010	15,946,941	23,048,287	36,121,593
Expenditure on													
1 Agricultural production . (incremental value of capital)	1,516,560	1,408,000	524,000	---	1,432,000	7,274,000	6,658,000	19,900,000	1,347,000	5,339,000	5,509,000	5,000,000	10,837,000
2 Farm household (wage for labor input)	2,575,020	1,601,380	1,335,456	938,666	1,418,383	5,033,614	4,216,222	4,695,881	5,017,165	6,178,713	6,499,588	9,786,997	15,752,664
3 Non-agricultural production	836,257	889,930	678,832	571,603	310,791	2,852,263	2,735,175	2,263,530	2,634,926	1,951,297	3,938,353	8,261,290	9,531,929
Total	4,927,837	3,899,310	2,538,288	1,510,269	3,161,174	15,159,877	13,609,397	26,859,411	8,999,091	13,469,010	15,946,941	23,048,287	36,121,593

TABLE 3

SHEET OF AGRICULTURAL SAVINGS AND INVESTMENT (cont)

Unit OT $ before 1950
NT $ after 1950

Accounts	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
Receipts from												
1 Agricultural production (depreciation)	4,206,297	4,611,442	7,645,072	9,566,939	6,634,069	5,898,440	6,629,760	6,100,044	6,299,278	6,470,941	6,954,176	8,242,351
2 Farm household (savings)	29,802,194	21,337,732	15,743,219	15,659,130	22,711,309	17,231,953	11,011,793	7,233,607	17,885,311	5,188,006	20,381,516	15,919,076
3 Non-agricultural production & household	2,027,896	3,911,327	5,734,765	4,917,603	10,982,801	8,204,117	2,639,907	3,148,739	1,125,654	2,589,340	2,962,166	5,679,222
4 Public finance	2,031,165	2,496,684	1,400,000	3, x00,000	6,015,045	2,544,962	3,607,187	663,822	580,824	630,212	1,029,552	977,373
Total	38,067,552	32,357,185	30,523,056	33,143,672	46,343,224	33,879,472	23,888,647	17,146,212	25,891,067	14,878,499	31,327,410	30,818,022
Expenditure on												
1 Agricultural production (incremental value of capital)	11,539,000	11,586,000	9,240,000	4,489,000	9,351,000	7,294,000	---	---	14,510,000	1,971,000	16,753,000	---
2 Farm household (wage for labor input)	14,800,404	12,769,363	12,890,497	17,436,691	21,992,034	14,546,904	13,344,627	9,428,152	6,454,367	4,874,949	8,430,350	16,635,372
3 Non-agricultural production	11,728,148	8,001,822	8,392,559	11,217,981	15,000,190	12,038,568	10,544,020	7,718,060	4,926,700	8,032,550	6,144,060	14,182,650
Total	38,067,552	32,357,185	30,523,056	33,143,672	46,343,224	33,879,472	23,888,647	17,146,212	25,891,067	14,878,499	31,327,410	30,818,022

TABLE 3

SHEET OF AGRICULTURAL SAVINGS AND INVESTMENT (cont)

Unit OT $ before 1950
NT $ after 1950

Accounts	1936	1937	1938	1939	1940	1950	1951	1952	1953	1954	1955
Receipts from											
1 Agricultural production (depreciation)	8,831,125	8,104,943	8,660,625	9,949,711	10,757,259	84,152,354	73,816,738	92,951,281	119,481,436	115,245,416	131,339,358
2 Farm household (savings)	17,618,754	27,319,736	15,109,103	46,066,392	39,463,014	357,744,952	332,228,303	271,562,256	340,595,651	704,197,928	1,841,117,482
3 Non-agricultural production & household	5,924,377	3,578,589	400,729	6,699,146	10,109,920	5,000,000	8,000,000	10,000,000	15,000,000	19,129,950	12,618,450
4 Public finance	---	---	80,000	25,000	4,206,445	449,694	14,929,051	24,040,907	26,355,915	27,494,832	37,838,791
Total	32,374,256	39,003,268	24,250,457	62,740,249	64,536,638	447,347,000	494,974,092	398,554,444	501,433,002	866,068,126	2,022,914,081
Expenditure on											
1 Agricultural production (incremental value of capital)	16,641,000	17,433,000	12,258,000	34,618,000	36,432,000	281,466,503	280,000,000	232,443,000	336,189,000	756,966,000	1,234,001,000
2 Farm household (wage for labor input)	8,736,366	12,562,918	6,381,957	14,893,499	15,637,058	116,029,547	147,160,015	94,950,656	116,485,621	77,129,398	415,870,764
3 Non-agricultural production	6,996,890	9,007,350	5,610,500	13,228,750	12,467,580	49,850,950	67,814,077	71,160,788	48,758,381	31,972,728	373,042,317
Total	32,374,256	39,003,268	24,250,457	62,740,249	64,536,638	447,347,000	494,974,092	398,554,444	501,433,002	866,068,126	2,022,914,081

TABLE 3

SHEET OF AGRICULTURAL SAVINGS AND INVESTMENT (cont)

Unit OT $ before 1950
NT $ after 1950

Accounts	1956	1957	1958	1959	1960
Receipts from					
1 Agricultural production (depreciation)	149,755,468	159,419,934	170,778,409	179,804,834	214,938,827
2 Farm household (savings)	1,230,627,641	3,324,026,006	3,435,959,613	4,444,263,981	3,504,923,383
3 Non-agricultural production & household	24,336,450	34,758,040	57,107,700	104,653,350	---
4 Public finance	41,117,345	20,734,446	56,754,989	26,001,877	179,749,500
Total	1,445,836,904	3,538,738,426	3,720,600,711	4,754,723,842	3,899,611,710
Expenditure on					
1 Agricultural production (incremental value of capital)	56,448,000	1,080,597,000	658,681,000	1,376,568,000	1,559,704,000
2 Farm household (wage for labor input)	725,063,808	1,252,431,143	1,629,549,746	1,756,287,719	1,282,774,610
3 Non-agricultural production	664,325,096	1,205,910,283	1,432,369,965	1,621,868 123	1,057,133,100
Total	1,445,836,904	3,538,938,426	3,720,600,711	4,754,723,842	3,899,611,710

TABLE 4

BALANCE OF CURRENT AND CAPITAL ACCOUNTS OF THE AGRICULTURE SECTOR WITH NON-AGRICULTURE AND OTHER SECTORS IN TAIWAN, 1911 - 1960

Unit T $1,000

Items/Period	1911	1912	1913	1914	1915	1916	1917	1918
1 Total agricultural production (Y_a)	99,504	103,823	110,069	88,958	84,438	103,209	144,979	208,542
2 Total sale of agricultural products to non-agriculture (X)	55,308	51,885	62,248	51,627	53,073	61,423	85,372	106,377
3 Sale ratio $(\frac{X}{Y_a})$ %	60 57	49 97	56 55	58 04	62 85	59 51	58 89	51 01
4 Total outflow of agricultural products (X)	55,308	51,885	62,248	51,627	53,073	61,423	85,372	106,377
a Non-agricultural production (O)	27,927	26,575	24,476	27,259	32,081	37,999	50,094	57,305
b Non-agricultural household (C_a^n)	19,367	15,784	22,626	17,992	13,496	14,828	23,043	25,344
c Direct exports (E_a)	8,014	9,526	15,146	6,376	7,496	8,596	12,235	23,728
5 Total inflow on non-agricultural goods (M)	28,787	27,423	34,128	29,829	32,651	40,325	54,202	62,133
a Working capital goods (C_n)	3,497	5,409	5,674	5,914	7,630	9,761	14,243	16,277
b Fixed capital goods (I_a)	836	890	679	572	311	2,852	2,735	2,264
c Consumers goods (C_n^a)	24,454	21,124	27,775	23,343	24,710	27,712	37,224	43,592
6 $X - M = B_a$ (4)-(5)	26,521	24,462	28,120	21,798	20,422	21,098	31,170	44,244
7 Terms of Trade $T = \frac{P_n}{P_a}$	1 052	1 117	1 167	1 328	1 473	1.342	1 402	1 227
1935-37=100								
P_a	59 6	68 3	65 8	56 0	49 3	52 9	69 1	95 3
P_n	62 7	76 3	76 8	74 4	72 6	71 0	96 9	116 9
8 Visible net real outflow $\frac{B_a}{P_a} = V_1$	44,498	35,816	42,736	38,925	41,424	39,883	45,109	46,426
9 Invisible net real outflow $V_2 = \frac{M}{P_n}(\frac{P_n}{P_a} - 1)$	2,389	4,209	7,428	13,173	21,255	19,433	22,503	12,046
10 Net real capital outflow (B")	46,887	40,025	50,164	52,098	62,679	59,316	67,612	58,472
11 Gross outflow of fund (F)	33,723	29,075	31,284	25,839	23,468	28,062	39,645	54,932
a Land rent and interest paid (Z)	27,514	22,627	24,837	19,478	16,721	20,782	30,973	45,670
b Taxes and fees (J)	6,009	6,198	6,175	6,121	6,369	6,752	7,372	8,255
c Fund outflow through financial institution (Q)	200	250	272	240	378	528	1,300	1,007
12 Gross inflow of fund (G)	7,202	4,613	3,164	4,043	3,046	6,964	8,475	10,688
a Public subsidy and investment (S)	4,305	1,753	1,497	452	411	826	1,125	1,088
b Non-agriculture s investment in agriculture (H)	310	350	299	251	440	532	1,047	1,816
c Non-farm income from non-agriculture sector (W)	- 2,587	2,510	1,368	3,340	2,195	5,606	6,303	7,784
13 Net outflow of fund (B = F - G)	26,521	24,462	28,120	21,796	20,422	21,098	31,170	44,244
14 Real commodity outflow = X/P_a	92,799	75,966	94,602	92,191	107,653	116,112	123,548	111,623
15. Real commodity inflow = M/P_n	45,912	35,941	44,438	40,093	44,974	56,796	55,936	53,151
16 Real net outflow of commodity = B'_a (14)-(15)	46,887	40,025	50,164	52,098	62,679	59,316	67,612	58,472

TABLE 4

BALANCE OF CURRENT AND CAPITAL ACCOUNTS OF THE AGRICULTURE SECTOR WITH NON-AGRICULTURE AND OTHER SECTORS IN TAIWAN, 1911 - 1960

Unit T $1,000 (cont)

	Items/Period	1919	1920	1921	1922	1923	1924	1925	1926
1	Total agricultural production (Y_a)	253,027	229,079	211,523	195,942	208,771	270,038	326,249	307,033
2	Total sale of agricultural products to non-agriculture (X)	142,707	131,521	132,266	127,453	126,854	173,118	213,433	200,602
3	Sale ratio ($\frac{X}{Y_a}$) %	56 40	57 41	62 53	65 05	60 76	64 11	65 42	65 34
4	Total outflow of agricultural products (X)	142,707	131,521	132,265	127,453	126,584	173,118	213,433	200,602
	a Non agricultural production (O)	66,965	67,155	74,649	71,353	68,828	78,430	96,180	100,344
	b Non-agricultural household (C_a^n)	39,871	44,946	36,371	41,429	30,780	48,217	47,740	44,186
	c Direct exports (E_a)	35,871	19,420	21,245	14,671	27,246	46,471	69,513	56,072
5	Total inflow on non-agricultural goods (M)	83,232	76,986	83,725	87,454	86,729	121,825	143,951	134,897
	a Working capital goods (C_n)	24,012	21,746	19,537	22,514	24,796	34,795	42,044	44,703
	b Fixed capital goods (I_a)	2,635	1,951	3,938	8,261	9,532	11,728	8,002	8,393
	c Consumers' goods (C_n^a)	56,585	53,289	60,250	56,679	52,401	75,302	93,905	81,801
6	$X - M = B_a$ (4)-(5)	59,475	54,535	48,540	39,999	40,125	51,293	69,482	65,705
7	Terms of Trade $T = \frac{P_n}{P_a}$	1 225	1 368	1 159	1 265	1 171	1 099	0 961	0 970
	1935-37=100								
	P_a	121 7	117.5	106 5	87 6	92 4	103 7	119 1	115 1
	P_n	149 1	160 7	123 4	110 8	108 2	114 0	114 5	111 7
8	Visible net real outflow $\frac{B_a}{P_a} = V_1$	48,870	46,413	45,577	45,661	43,425	49,463	58,339	57,085
9	Invisible net real outflow $V_2 = \frac{M}{P_n}(\frac{P_n}{P_a} - 1)$	12,568	17,613	10,768	20,903	13,707	10,614	-4,855	-3,567
10	Net real capital outflow (B")	61,438	64,026	56,345	66,564	57,132	60,077	53,484	53,518
11	Gross outflow of fund (F)	72,899	67,209	63,573	59,880	60,086	72,934	82,819	76,102
	a Land rent and interest paid (Z)	62,652	54,174	47,386	44,188	44,300	56,402	66,677	60,704
	b Taxes and fees (J)	9,117	12,553	15,169	15,307	15,208	15,187	14,544	14,906
	c Fund outflow through financial institution (Q)	1,130	482	1,018	385	578	1,345	1,595	492
12	Gross inflow of fund (G)	13,424	12,674	15,033	19,881	19,961	21,641	13,337	10,397
	a Public subsidy and investment (S)	1,245	2,779	3,682	3,587	3,433	2,446	2,851	1,682
	b Non-agriculture's investment in agriculture (H)	2,212	989	1,194	649	6,870	2,028	3,911	5,736
	c Non-farm income from non-agriculture sector (W)	9,967	8,906	10,157	15,645	9,658	17,167	6,575	2,979
13	Net outflow of fund (B = F - G)	59,475	54,535	48,540	39,999	40,125	51,293	69,482	65,705
14	Real commodity outflow = X/P_a	117,261	111,933	124,193	145,494	137,288	166,941	179 205	174,285
15	Real commodity inflow = M/P_n	55,823	47,907	67,848	78,930	80,156	106,864	125,721	120,767
16	Real net outflow of commodity = B'_a (14)-(15)	61,438	64,026	56,345	66,564	57,132	60,079	53,484	53,518

TABLE 4

BALANCE OF CURRENT AND CAPITAL ACCOUNTS OF THE AGRICULTURE SECTOR WITH NON-AGRICULTURE AND OTHER SECTORS IN TAIWAN, 1911 - 1960

Unit T $1,000 (cont)

Items/Period	1927	1928	1929	1930	1931	1932	1933	1934
1 Total agricultural production (Y_a)	283,949	310,212	316,4[illegible]	266,150	216,454	300,297	247,166	317,953
2 Total sale of agricultural products to non-agriculture (X)	194,261	212,697	217,191	195,595	161,328	213,056	175,327	219,597
3 Sale ratio $(\frac{X}{Y_a})$ %	68 41	68 57	68 63	73 49	74 53	70 95	70 93	69 07
4 Total outflow of agricultural products (X)	194,261	212,697	217,191	195,595	161,328	213,056	175,327	219,597
a Non-agricultural production (O)	93,928	106,878	110,304	108,745	89,005	100,588	66,959	77,058
b Non-agricultural household (C_a^n)	44,261	52,328	46,795	49,974	37,651	58,440	40,866	43,698
c. Direct exports (E_a)	56,072	53,491	51,092	36,876	34,672	54,028	67,502	98,841
5 Total inflow on non-agricultural goods (M)	135,329	154,154	152,567	140,040	109,011	147,758	123,891	152,323
a Working capital goods (C_n)	47,003	46,915	47,546	40,517	34,000	46,387	43,911	51,001
b Fixed capital goods (I_a)	11,218	15,000	12,039	10,544	7,718	4,927	8,033	6,144
c Consumers' goods (C_n^a)	77,108	92,239	92,982	88,979	67,293	96,444	71,947	95,178
6 $X - M = B_a$ (4)-(5)	58,932	58,543	64,624	55,555	52,317	65,298	51,436	67,274
7. Terms of Trade $T = \frac{P_n}{P_a}$	1 018	0.997	0 961	1 049	1 173	1 038	1 183	1 050
1935-37=100								
P_a	103 3	105 2	105 8	85 2	68 1	78 6	74 5	83 9
P_n	105 2	104 9	101.7	89 4	79 9	81 6	88 1	88 1
8. Visible net real outflow $\frac{B_a}{P_a} = V_1$	57,049	55,649	61,081	65,205	76,824	83,076	69,042	80,184
9 Invisible net real outflow $V_2 = \frac{M}{P_n}(\frac{P_n}{P_a} - 1)$	2,366	-419	-5,814	7,723	23,641	6,912	25,671	8,655
10 Net real capital outflow (B")	59,415	55,230	55,267	72,928	100,465	89,988	94,713	88,839
11 Gross outflow of fund (F)	68,775	78,686	82,936	73,660	59,158	71,616	66,866	82,228
a. Land rent and interest paid (Z)	51,784	61,261	65,209	57,404	41,911	52,777	48,479	59,866
b Taxes and fees (J)	15,832	16,193	16,771	16,256	16,011	15,990	16,688	17,428
c Fund outflow through financial institution (Q)	1,159	1,232	956	---	1,236	2,849	1,699	4,934
12 Gross inflow of fund (G)	9,843	20,143	18,312	18,105	6,841	6,318	15,430	14,954
a Public subsidy and investment (S)	3,230	6,298	2,899	4,084	1,142	878	844	1,191
b Non-agriculture's investment in agriculture (H)	4,918	10,983	8,204	2,640	3,149	1,125	2,589	2,962
c Non-farm income from non-agriculture sector (W)	1,695	2,862	7,209	11,381	2,550	4,315	11,997	10,801
13 Net outflow of fund (B = F - G)	58,932	58,543	64,624	55,555	52,317	65,298	51,436	67,274
14 Real commodity outflow = X/P_a	188,055	202,183	205,284	229,572	236,899	271,064	235,338	261,737
15 Real commodity inflow = M/P_n	128,640	146,953	150,017	156,644	136,434	181,076	140,625	172,898
16 Real net outflow of commodity = B'_a (14)-(15)	59,415	55,230	55,267	72,928	100,465	89,988	94,713	88,839

TABLE 4

BALANCE OF CURRENT AND CAPITAL ACCOUNTS OF THE AGRICULTURE SECTOR WITH NON-AGRICULTURE AND OTHER SECTORS IN TAIWAN, 1911 - 1960

Unit T $1,000 (cont)

	Items/Period	1935	1936	1937	1938	1939	1940	1950	1951
1	Total agricultural production (Y_a)	371,116	416,447	433,145	486,894	602,717	599,440	3,547,715	4,367,488
2	Total sale of agricultural products to non-agriculture (X)	273,042	294,749	309,693	359,439	432,313	416,178	2,024,177	2,680,387
3	Sale ratio ($\frac{X}{Y_a}$) %	73 57	70 78	71 50	73 82	71 73	69 43	57 06	61 37
4	Total outflow of agricultural products (X)	273,042	294,749	309,693	359,439	432,313	416,178	2,024,177	2,680,387
	a Non-agricultural production (O)	107,826	112,854	129,013	148,230	212,884	215,051	870,614	1,387,068
	b Non-agricultural household (C_a^n)	61,125	66,986	60,415	80,759	96,205	104,925	1,080,127	1,199,619
	c Direct exports (E_a)	104,091	114,909	120,265	130,450	123,224	96,202	73,436	93,700
5	Total inflow on non-agricultural goods (M)	196,450	206,232	218,647	249,198	315,446	313,938	1,682,678	1,987,838
	a Working capital goods (C_n)	59,968	72,553	72,780	77,321	90,322	99,056	496,187	509,664
	b Fixed capital goods (I_a)	14,183	6,997	9,007	5,611	13,229	12,468	49,851	67,814
	c Consumers' goods (C_n^a)	122,299	126,682	136,860	166,266	211,895	202,414	1,136,640	1,410,360
6	$X - M = B_a$ (4)-(5)	76,592	88,517	91,046	110,241	116,867	102,240	341,499	692,549
7	Terms of Trade $T = \frac{P_n}{P_a}$ 1935-37=100	0 948	0 982	1 060	1 116	1 048	0 926	1 110	1 309
	P_a	96 7	100 2	103 1	112 5	134 1	150 9	738 8	1,039 9
	P_n	91 7	98 4	109 3	125 6	140 5	139 8	820 2	1,361 5
8	Visible net real outflow $\frac{B_a}{P_a} = V_1$	79,206	88,340	88,308	97,992	87,149	67,753	46,223	66,598
9	Invisible net real outflow $V_2 = \frac{M}{P_n}(\frac{P_n}{P_a} - 1)$	-11,077	-3,764	12,030	23,103	10,715	-16,518	22,604	45,152
10	Net real capital outflow (B")	68,129	84,576	100,338	121,095	97,864	51,235	68,827	111,750
11	Gross outflow of fund (F)	99,395	102,133	108,494	135,840	163,130	164,493	656,522	908,579
	a Land rent and interest paid (Z)	76,107	76,480	81,189	96,233	116,874	120,718	457,892	543,093
	b Taxes and fees (J)	18,808	22,247	27,305	29,721	32,580	38,866	193,630	353,486
	c Fund outflow through financial institution (Q)	4,480	3,406	---	9,886	13,676	4,909	5,000	12,000
12	Gross inflow of fund (G)	22,803	13,616	17,448	25,599	46,263	62,253	315,023	216,030
	a Public subsidy and investment (S)	1,076	180	139	402	2,810	7,206	1,644	15,846
	b Non-agriculture's investment in agriculture (H)	5,679	5,924	3,579	400	6,699	10,111	5,000	8,000
	c Non-farm income from non-agriculture sector (W)	16,048	7,512	13,730	24,797	36,754	44,936	308,379	192,184
13	Net outflow of fund (B = F - G)	76,592	88,517	91,046	110,241	116,867	102,240	341,499	692,549
14	Real commodity outflow = X/P_a	282,360	294,161	300,381	319,501	322,381	275,797	273,982	257,754
15	Real commodity inflow = M/P_n	214,231	209,585	200,043	198,406	224,517	224,562	205,155	146,004
16	Real net outflow of commodity = B'_a (14)-(15)	68,129	84,576	100,338	121,095	97,864	51,235	68,827	111,750

TABLE 4. BALANCE OF CURRENT AND CAPITAL ACCOUNTS OF THE AGRICULTURE SECTOR WITH NON-AGRICULTURE AND OTHER SECTORS IN TAIWAN, 1911 - 1960

Unit T $1,000 (cont)

Items/ Period	1952	1953	1954	1955	1956	1957	1958	1959	1960
1. Total agricultural production (Y_a)	6,386,245	9,444,643	8,483,469	11,034,479	10,934,441	13,891,587	15,840,518	17,577,464	22,898,066
2 Total sale of agricultural products to non-agriculture (X)	3,793,386	5,754,327	4,767,895	6,082,165	6,843,915	8,217,248	9,130,569	10,671,774	13,459,805
3 Sale ratio ($\frac{X}{Y_a}$) %	59 40	60 93	56 20	55 12	62 59	59 15	57 64	60 71	58 78
4 Total outflow of agricultural products (X)	3,793,386	5,754,327	4,767,895	6,082,165	6,843,915	8,217,248	9,130,569	10,671,774	13,459,805
a Non-agricultural production (O)	1,666,094	2,643,121	2,313,257	3,198,113	3,434,710	4,246,209	4,653,461	5,768,789	6,525,076
b Non-agricultural household (C_a^n)	1,882,951	2,842,882	2,245,576	2,400,702	3,064,379	3,138,954	3,824,145	4,391,865	6,467,078
c Direct exports (E_a)	244,341	268,324	209,062	483,350	344,826	832,085	652,963	511,120	467,651
5 Total inflow on non-agricultural goods (M)	2,895,692	4,274,251	3,738,038	5,027,489	5,979,862	7,608,520	8,555,363	9,908,678	11,529,200
a. Working capital goods (C_n)	840,161	1,351,922	1,509,340	1,608,222	1,948,235	2,162,894	2,465,784	2,592,096	3,802,963
b Fixed capital goods (I_a)	71,161	48,758	31,973	373,042	664,325	1,205,910	1,432,370	1,621,868	1,057,133
c Consumers' goods (C_n^a)	1,984,370	2,873,571	2,196,725	3,046,225	3,367,302	4,239,716	4,657,209	5,694,714	6,669,104
6 $X - M = B_a$ (4)-(5)	897,694	1,480,076	1,029,857	1,054,676	864,053	608,728	575,206	763,096	1,930,605
7. Terms of Trade $T = \frac{P_n}{P_a}$	1 215	1 253	1 413	1 198	1 264	1 235	1 212	1 171	1 146
1935-37=100									
P_a	1,378 6	1,829 0	1,501 0	1,942 3	1,997 1	2,194 4	2,260 5	2,579 2	3,386 4
P_n	1,674 6	2,292 2	2,121 6	2,326 0	2,524 5	2,709 5	2,739 5	3,019 0	3,880 8
8. Visible net real outflow $\frac{B_a}{P_a} = V_1$	65,116	80,923	68,611	54,300	43,265	27,740	25,446	29,587	57,011
9 Invisible net real outflow $V_2 = \frac{M}{P_n}\left(\frac{P_n}{P_a} - 1\right)$	37,128	47,124	72,847	42,981	62,555	65,915	66,175	55,965	43,373
10 Net real capital outflow (B")	102,244	128,147	141,458	97,281	105,820	93,655	91,621	85,552	100,384
11 Gross outflow of fund (F)	1,418,926	1,602,030	1,586,999	1,850,029	2,025,896	2,331,618	2,595,013	2,495,874	3,632,172
a Land rent and interest paid (Z)	727,555	487,134	426,766	549,372	584,406	623,879	664,570	810,462	1,010,635
b Taxes and fees (J)	673,371	1,094,861	928,440	1,025,546	1,128,980	1,310,401	1,359,254	1,362,813	2,102,020
c Fund outflow through financial institution (Q)	18,000	20,035	231,793	275,111	312,510	397,338	571,189	322,599	519,517
12 Gross inflow of fund (G)	521,232	121,954	557,142	795,353	1,161,843	1,722,890	2,019,807	1,732,778	1,701,567
a Public subsidy and investment (S)	26,796	33,503	35,167	43,968	46,765	26,051	64,077	32,830	187,435
b Non-agriculture's investment in agriculture (H)	10,000	15,000	19,130	12,618	24,336	34,758	57,108	104,652	---
c Non-farm income from non-agriculture sector (W)	484,436	73,451	502,845	738,767	1,090,742	1,662,081	1,898,622	1,595,296	1,514,132
13 Net outflow of fund (B = F - G)	897,694	1,480,076	1,029,857	1,054,676	864,053	608,728	575,206	763,096	1,930,605
14 Real commodity outflow = X/P_a	275,162	314,616	317,648	313,424	342,693	374,464	403,918	413,763	397,467
15 Real commodity inflow = M/P_n	172,918	186,469	176,190	216,143	236,873	280,809	312,297	328,211	297,083
16 Real net outflow of commodity = B'_a (14)-(15)	102,244	128,147	141,458	97,281	105,820	93,655	91,621	85,552	100,384

TABLE 5

INDICES OF PRICES PAID BY FARMERS

Base Period 1935 - 1937

Period/Items	Fertilizer (Nitrogen)	Soybean Cake	Plow	Cement	Brick	Wood	Textile	Fuel Oil	Sugar	Salt	Wine	Tobacco	Paper	Total Index
	Metric Tons	Metric Tons	1 Unit	170 Kilograms	1,000 Units	1 Tupo	1 Tan	1 Case	1 Kilogram	1 Kilogram	1 Bottle	1 Case	2,000 Sheets	
Index Weight	327	65	7	10	4	8	107	69	25	58	137	97	86	1,000
1911	51.7	65 9	49 6	102 8	34 8	102 2	83 1	64 7	73 3	95 3	76 0	51 4	37 4	62.7
1912	63 0	64 1	49.6	106 0	69 3	104 5	161 0	69 8	88 6	95 3	80 0	52 4	37 4	76 3
1913	63 4	65 3	59 4	110 9	68 5	108 2	161 0	76 8	84 8	91 3	80 0	52 4	37 4	76 8
1914	63 0	61 3	53 6	87 5	54 8	106 7	157 1	76 7	81 9	84 2	74 0	52 4	37 4	74 4
1915	63 4	52 6	100 7	79 2	40 8	93 3	150 6	74.1	84 8	84 2	71 0	52 4	35 7	72 6
1916	74 0	60 6	152 2	120 6	39 1	100 0	155 8	102 9	90 5	93 2	80 0	53 3	42 9	71 0
1917	101 5	81 8	249 3	196 5	52 8	156 7	136 4	112 9	95 2	96 3	88 0	61 0	55 4	96 9
1918	116 6	101 8	302 2	207 9	88 0	220 9	155 8	154 4	107 6	109 5	104 0	68 6	97 0	116 9
1919	138 9	132 5	205 2	185 0	111 9	328 4	271 4	180 1	168 0	123 7	143 0	78 1	100 4	149 1
1920	155 4	136 9	212 1	267 9	155 4	447 8	246 8	176 7	238 4	110 7	164 0	78 9	133 0	160 7
1921	101 6	95 5	146 6	166 5	84 1	328 4	170 1	152 7	128 0	114 0	161 0	78 9	116 8	123 4
1922	104 1	103 9	114 9	184 8	72 5	328 4	127 3	132 1	108 0	115 7	100 0	78.9	126 0	110 8
1923	106 3	94 7	134 5	175 5	74 8	282 1	113 0	110 8	131 2	115 7	100 0	78 9	124 1	108 2
1924	115 1	109 9	101 7	130 3	99 8	283 6	148 1	124 5	119 2	115 7	100 0	78 9	104 6	114 0
1925	115 4	116 9	93 7	137 0	108 3	231 3	144 2	129 5	108 8	115 7	100 0	81 6	107 5	114 5
1926	115 5	103 0	82 2	141 1	118 2	192 5	131 2	115 3	101 6	115 7	100 0	94 7	105 3	111 7
1927	106 7	89 4	73 6	137 6	127 2	160 4	109 1	111 3	110 4	115 7	100 0	94 7	105 0	105 2
1928	107 5	94 3	81 0	137 7	123 3	151 5	106 5	112 9	92 8	115 7	100 0	94.7	103 9	104 9
1929	105 8	95 1	76 4	138 8	122 3	147 0	106 5	97 4	97 6	115 7	100 0	94 7	83 1	101 7
1930	84.5	73 5	66 1	115 2	98 6	132 8	81 8	94 0	86 4	106 6	100 0	94 7	83 1	89 4
1931	69 4	46 2	58 0	125 6	78 3	99 3	74 0	94 7	76 0	101 7	100 0	94 7	73 5	79 9
1932	66 7	64 8	67 8	127 3	76 3	91 8	76 6	98 5	84 0	101 7	100 0	94 7	80 7	81.6
1933	76 5	76 7	83 9	127 0	78 3	82 1	93 5	108 2	95 2	101 7	100 0	94 7	75 6	88 1
1934	80 4	68 2	79 9	122 9	67 0	79 9	97 4	95 7	90 4	101 7	100 0	94 7	75 6	88 1
1935	89 6	86 5	69 5	109 9	88 7	83 6	93 5	94 3	92 8	101 7	100 0	94 7	75 6	92 7
1936	105 0	98 3	70 1	99 5	105 7	73 1	97 4	94 9	97 6	101 7	100 0	96 3	81 4	98 4
1937	105 4	115 1	161 6	90 3	105 7	97 8	107 8	110 8	108 8	97 5	100 0	108 6	143 1	109 3
1938	119 7	114 1	155 1	94 0	97 8	139 6	179 2	121 4	111 4	109 5	100 0	114 3	161 6	125 6
1939	134 4	145 2	140 0	95 8	114 9	172 4	226 0	134 1	115 2	109 5	100 0	116 2	180 1	140 5
1940	140 4	139 4	138 0	122 4	126 5	223 9	227 3	135 5	110 0	109 5	100 0	116 2	145 4	139 8

TABLE 6 MAJOR STATISTICAL INDICATORS FOR TAIWAN'S ECONOMIC DEVELOPMENT*

Item	1911	1912	1913	1914	1915	1916	1917	1918
Cultivated land area (Hectares)	687,187	689,086	691,032	693,173	700,080	716,205	720,637	732,255
Agricultural labor force (Persons)	1,106,141	1,127,569	1,169,970	1,193,952	1,165,378	1,131,531	1,124,629	1,113,926
Crop planted area (Hectares)	792,673	789,941	806,061	821,343	821,394	832,708	842,362	898,958
Total working days of agricultural labor (1,000 Days)	135,095	132,729	132,256	135,650	138,393	145,516	148,352	157,590
Chemical fertilizers consumed (Metric Tons)	27,844	43,001	47,710	50,017	85,263	89,950	93,549	85,930
Seed expenses (T $1,000)	6,400	6,314	6,336	6,510	6,680	7,013	7,212	7,897
Feed expenses (T $1,000)	14,033	14,580	15,191	16,027	16,189	16,920	17,492	17,141
Cattle number (Head)	478,390	446,587	418,830	404,507	398,789	386,179	377,277	384,862
Depreciation on house (T $1,000)	551	571	429	519	530	806	932	883
Farm implement expenses (T $1,000)	79	82	62	75	76	116	134	127
Materials and miscellaneous expenses (T $1,000)	47	202	370	551	678	712	687	619
Fee for irrigation services (T $1 000)	1,949	1,962	1,952	1,999	2,032	2,068	2,195	2,331
Total agricultural input index (1935-37=100)	65 89	66 12	66 30	67 18	68 73	71 02	71 93	73 78
Total agricultural output index (1935-37=100)	44 74	39 95	45 66	43 79	47 05	48 81	53 29	51 02
Multiple cropping index (Percent)	115 35	114 50	116 65	118 49	117 33	116 27	116 89	122 77
Crop yield index (1935-37=100)	63 57	54 83	62 24	59 35	63 75	56 13	70 01	66 58
Land productivity per hectare land area (1935-37=100)	54 89	48 93	55 77	53 34	56 65	57 53	62 38	58 85
Agricultural population (1,000 Persons)	2,124	2,162	2,199	2,226	2,253	2,279	2,285	2,291
Total population (1,000 Persons)	3,369	3,435	3,502	3,554	3,570	3,596	3,647	3,670
Total labor force (1,000 Persons)	1,548	1,591	1,635	1,668	1,630	1,593	1,592	1,586
Total national product (1935-37 Constant Price at T $1,000)	298,281	317,032	280,990	280,506	291,492	330,944	357,109	298,903
National product of primary industry (1935-37 Constant Price at T $1,000)	143,434	173,225	158,697	120,900	106,738	104,116	119,935	129,099
National product of secondary industry (1935-37 Constant Price at T $1,000)	78,784	73,571	52,501	82,184	104,058	142,968	148,682	94,421
National product of tertiary industry (1935-37 Constant Price at T $1,000)	76,063	70,236	69,792	77,422	80,696	83,862	88,492	75,383

* NOTE The statistics were estimated by the author. The detail exposition on estimate will be made in another report

TABLE 6 MAJOR STATISTICAL INDICATORS FOR TAIMAN S ECONOMIC DEVELOPMENT* (cont)

Item	1919	1920	1921	1922	1923	1924	1925	1926
Cultivated land area (Hectares)	737,923	749,419	752,805	750,540	752,076	761,800	775,468	790,044
Agricultural labor force (Persons)	1,111,598	1,136,988	1,107,304	1,115,823	1,125,963	1,129,363	1,152,335	1,161,426
Crop planted area (Hectares)	874,896	858,882	875,427	917,489	904,290	938,491	965,186	977,487
Total working days of agricultural labor (1,000 Days)	152,264	148,404	152,482	160,497	155,267	161,432	166,398	168,480
Chemical fertilizers consumed (Metric Tons)	105,438	125,076	112,217	122,633	141,477	176,218	203,337	213,327
Seed expenses (T $1,000)	7,628	7,256	7,562	8,063	7,709	8,012	8,269	8,321
Feed expenses (T $1,000)	18,372	19,192	17,554	18,495	18,546	21,650	24,428	24,974
Cattle number (Head)	404,162	429,093	421,505	408,992	391,305	382,916	378,979	381,159
Depreciation on house (T $1,000)	1,291	1,184	1,672	2,171	2,520	3,216	3,533	6,462
Farm implement expenses (T $1,000)	186	160	1,285	2,447	2,840	3,625	3,982	7,284
Materials and miscellaneous expenses (T $1,000)	618	599	854	934	1,054	1,124	1,213	1,296
Fee for irrigation services (T $1,000)	2,526	2,558	2,605	2,640	2,743	2,791	2,937	3,106
Total agricultural input index (1935-37=100)	74 20	74 89	75 62	77 27	77 16	80 29	83 14	86 03
Total agricultural output index (1935-37=100)	52 63	48 80	51 23	57 06	55 01	64 83	68 51	67 29
Multiple cropping index (Percent)	121 27	114 61	116 29	122 24	120 24	123 19	124 46	123 73
Crop yield index (1935-37=100)	67 97	64 81	67 32	72 16	70 57	78 87	81 22	78 86
Land productivity per hectare land area (1935-37=100)	60 18	54 89	57 53	64 14	61 72	71 86	74 50	71 86
Agricultural population (1,000 Persons)	2,297	2,261	2,227	2,220	2,263	2,305	2,340	2,377
Total population (1,000 Persons)	3,715	3,758	3,836	3,905	3,976	4,042	4,147	4,242
Total labor force (1,000 Persons)	1,592	1,637	1,599	1,616	1,634	1,644	1,681	1,698
Total national product (1935-37 Constant Price at T $1,000)	368,834	326,946	338,881	324,882	380,756	453,427	497,770	496,031
National product of primary industry (1935-37 Constant Price at T $1,000)	150,950	111,333	139,634	127,324	137,426	176,537	215,845	207,025
National product of secondary industry (1935-37 Constant Price at T $1,000)	132,885	115,810	77,883	84,431	119,553	139,719	126,031	124,031
National product of tertiary industry (1935-37 Constant Price at T $1,000)	84,999	99,803	121,364	113,127	123,777	137,171	155,894	164,975

* NOTE The statistics were estimated by the author The detail exposition on estimate will be made in another report

TABLE 6 MAJOR STATISTICAL INDICATORS FOR TAIWAN'S ECONOMIC DEVELOPMENT* (cont)

Item	1927	1928	1929	1930	1931	1932	1933	1934
Cultivated land area (Hectares)	797,151	806,754	805,044	812,116	810,277	814,471	820,047	825,726
Agricultural labor force (Persons)	1,173,892	1,188,524	1,202,670	1,212,083	1,242,968	1,272,002	1,298,241	1,325,107
Crop planted area (Hectares)	969,761	979,755	972,212	1,012,089	1,028,687	1,078,635	1,074,098	1,083,074
Total working days of agricultural labor (1,000 Days)	165,105	169,417	171,530	173,652	173,362	180,630	176,783	180,225
Chemical fertilizers consumed (Metric Tons)	231,436	261,016	256,582	265,581	298,209	281,679	320,101	363,799
Seed expenses (T $1,000)	8,053	8,176	8,284	8,462	8,500	8,955	8,716	8,901
Feed expenses (T $1,000)	27,985	28,752	31,160	32,162	32,371	33,180	34,382	37,083
Cattle number (Head)	385,629	387,944	389,839	390,859	383,042	366,606	386,270	394,865
Depreciation on house (T $1,000)	8,410	5,836	5,335	6,846	6,990	7,266	7,010	7,186
Farm implement expenses (T $1,000)	9,480	6,579	6,014	7,116	7,267	7,554	7,287	7,470
Materials and miscellaneous expenses (T $1,000)	1,083	883	660	725	756	882	919	985
Fee for irrigation services (T $1,000)	3,176	3,254	3,674	3,700	3,768	3,769	3,833	3,865
Total agricultural input index (1935-37=100)	87 84	88 54	88 97	90 71	91 31	92 59	93 32	95 69
Total agricultural output index (1935-37=100)	71 14	73 86	74 26	79 86	81 20	93 25	84 53	91 64
Multiple cropping index (Percent)	121 65	121 44	120 77	124 62	126 95	132 43	130 98	131 17
Crop yield index (1935-37=100)	84 13	86 37	85 75	91 14	91 41	99 21	91 93	97 69
Land productivity per hectare land area (1935-37=100)	75 39	77 37	77 81	83 10	84 64	96 77	87 07	93 68
Agricultural population (1,000 Persons)	2,402	2,458	2,489	2,534	2,583	2,576	2,638	2,701
Total population (1,000 Persons)	4,337	4,438	4,549	4,679	4,804	4,930	5,061	5,195
Total labor force (1,000 Persons)	1,721	1,747	1,772	1,790	1,850	1,908	1,962	2,019
Total national product (1935-37 Constant Price at T $1,000)	495,035	562,382	611,899	635,526	612,343	717,677	657,615	717,789
National product of primary industry (1935-37 Constant Price at T $1,000)	193,334	223,046	236,966	229,637	205,727	277,926	205,369	249,677
National product of secondary industry (1935-37 Constant Price at T $1,000)	125,939	147,398	166,388	182,534	176,794	191,400	214,726	215,309
National product of tertiary industry (1935-37 Constant Price at T $1,000)	175,762	191,938	208,545	223,355	229,822	248,351	237,520	257,803

* NOTE The statistics were estimated by the author The detail exposition on estimate will be made in another report

TABLE 6 MAJOR STATISTICAL INDICATORS FOR TAIWAN'S ECONOMIC DEVELOPMENT* (cont)

Item	1935	1936	1937	1938	1939	1940	1950	1951
Cultivated land area (Hectares)	831,003	846,021	856,689	857,789	859,550	860,439	870,633	873,871
Agricultural labor force (Persons)	1,291,847	1,325,001	1,353,748	1,382,538	1,409,555	1,399,807	1,730,928	1,728,947
Crop planted area (Hectares)	1,130,524	1,144,489	1,123,330	1,103,956	1,146,837	1,173,990	1,483,516	1,483,007
Total working days of agricultural labor (1,000 Days)	191,466	194,932	188,733	189,448	199,489	202,390	225,321	228,767
Chemical fertilizers consumed (Metric Tons)	422,628	438,410	460,933	472,041	488,963	554,864	298,117	344,391
Seed expenses (T $1,000)	9,518	9,713	9,491	9,485	10,018	10,306	13,339	12,968
Feed expenses (T $1,000)	35,495	39,439	35,465	32,463	32,192	24,055	29,284	32,666
Cattle number (Head)	390,454	370,955	358,442	325,104	324,780	300,112	364 939	374,791
Depreciation on house (T $1,000)	8,448	8,773	6,888	6,104	5,977	5,802	7,909	8,145
Farm implement expenses (T $1,000)	7,427	7,632	6,117	5,505	5,422	6,591	3,966	4,727
Materials and miscellaneous expenses (T $1,000)	1,108	1,058	929	933	887	771	1,079	999
Fee for irrigation services (T $1,000)	3,904	4,069	4,177	4,171	4,202	4,220	4,380	4,385
Total agricultural input index (1935-37=100)	98 69	101 36	99 95	99 30	101 05	101 19	101 78	104 19
Total agricultural output index (1935-37=100)	97 52	101 21	101 27	105 74	106 50	92 62	102 76	104 97
Multiple cropping index (Percent)	136 04	135 28	131 12	128 70	138 42	136 44	170 40	169 71
Crop yield index (1935-37=100)	98 11	100 25	101 64	107 34	102	90 25	84 63	84 50
Land p oductivity per hectare land area (1935-37=100)	99 19	100 96	99 85	104 04	104 70	90 82	99 41	101 18
Agricultural population (1,000 Persons)	2,790	2,855	2,880	2,896	2,925	2,934	3,998	4,161
Total population (1,000 Persons)	5,316	5,452	5,609	5,747	5,896	6,077	7,554	7,869
Total labor force (1,000 Persons)	1,986	2,054	2,115	2,178	2,239	2,244	2,849	2,881
Total national product (1935-37 Constant Price at T $1,000)	825,666	858,153	805,749	755,099	816,141	748,604	750,651	606,948
National product of primary industry (1935-37 Constant Price at T $1,000)	304,415	308,940	280,698	273,255	287,874	251,087	282,349	223,226
National product of secondary industry (1935-37 Constant Price at T $1,000)	248,279	265,898	269,073	249,079	288,93	275,940	151,279	128,146
National product of tertiary industry (1935-37 Constant Price at T $1,000)	272,972	283,315	255,978	232,765	239,334	221,577	317,023	255,576

* NOTE The statistics were estimated by the author The detail exposition on estimate will be made in another report

TABLE 6. MAJOR STATISTICAL INDICATORS FOR TAIWAN'S ECONOMIC DEVELOPMENT* (cont)

Item	1952	1953	1954	1955	1956	1957	1958	1959	1960
Cultivated land area (Hectares)	876,100	872,738	874,097	873,002	875,791	873,263	883,466	877,740	869,223
Agricultural labor force (Persons)	1,734,737	1,754,153	1,753,803	1,737,106	1,718,237	1,709,850	1,704,615	1,738,990	1,754,732
Crop planted area (Hectares)	1,506,428	1,505,851	1,519,006	1,495,161	1,535,152	1,563,038	1,590,063	1,593,522	1,595,469
Total working days of agricultural labor (1,000 Days)	241,669	246,238	245,837	242,519	251,416	268,141	275,056	274,136	268,998
Chemical fertilizers consumed (Metric Tons)	440,148	491,982	580,715	559,858	622,620	663,911	707,333	706,472	617,332
Seed expenses (T $1,000)	13,250	13,463	13,583	13,317	13,662	14,239	14,467	14,442	14,766
Feed expenses (T $1,000)	39,575	46,030	49,713	50,056	53,286	56,504	62,311	59,390	60,842
Cattle number (Head)	383,390	390,144	406,172	412,018	414,464	414,478	419,044	420,138	420,573
Depreciation on house (T $1,000)	8,217	8,415	8,264	7,962	8,277	9,844	10,739	11,543	11,093
Farm implement expenses (T $1,000)	4,454	4,654	4,603	4,532	4,416	4,761	7,929	8,918	8,175
Materials and miscellaneous expenses (T $1,000)	870	1,168	1,874	2,834	2,566	3,259	4,416	4,617	6,222
Fee for irrigation services (T $1,000)	4,329	4,388	4,317	4,286	4,404	4,416	4,427	4,391	4,455
Total agricultural input index (1935-37=100)	109 34	112 35	115 03	114 28	117 61	121 82	126 63	125 94	123 53
Total agricultural output index (1935-37=100)	113 32	126 37	127 03	125 25	137 02	145 14	154 34	154 06	154 85
Multiple cropping index (Percent)	171 95	172 54	173 78	171 27	175 52	178 99	179 98	181 55	183 55
Crop yield index (1935-37=100)	89 61	98 87	99 68	102 66	105 43	109 52	113 83	114 51	115 32
Land productivity per hectare land area (1935-37=100)	108 89	122 12	122 56	121 23	132 04	140 63	147 47	148 13	150 33
Agricultural population (1,000 Persons)	4,257	4,382	4,489	4,603	4,699	4,790	4,881	4,975	5,373
Total population (1,000 Persons)	8,129	8,438	8,749	9,078	9,390	9,690	10,039	10,431	10,792
Total labor force (1,000 Persons)	2,936	2,954	2,999	3,026	3,015	3,110	3,178	3,272	3,344
Total national product (1935-37 Constant Price at T $1,000)	632,607	797,134	819,019	861,150	881,944	947,877	1,023,165	1,060,410	1,157,459
National product of primary industry (1935-37 Constant Price at T $1,000)	222,745	313,995	272,992	287,864	289,749	303,959	324,018	323,860	395,117
National product of secondary industry (1935-37 Constant Price at T $1,000)	142,034	166,469	198,017	211,042	225,040	251,283	267,580	288,913	297,603
National product of tertiary industry (1935-37 Constant Price at T $1,000)	267,828	316,670	348,010	362,244	367,155	392,635	431,567	447,637	464,739

* NOTE The statistics were estimated by the author The detail exposition on estimate will be made in another report