

Taiwan's Agrarian Economy under Japanese Rule

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Taiwan's countryside began to experience gradual but profound change under Japanese rule. A substantial surplus of sugar cane and then food grains quickly became available to the market. The rapid expansion of cultivated farm land with slowly rising yields accounted for output growth before 1920, and then the more rapid adoption of a new farming technology enabled farmers to raise yields more rapidly after 1920 to account for most of output growth. By the 1920s Taiwan had begun to experience a genuine agricultural revolution in which farming practices became increasingly predicated upon scientific principles for using new seeds, chemical fertilizers, and modern irrigation methods.

The Taiwan economy slowly benefitted from rising agricultural prosperity. The state obtained increased land taxes and excise revenues from farmers to expand an infrastructure of railways, modern harbors, and standard marketing facilities. These developments initiated moderate urban expansion and stimulated new industries processing farm products that required more non-farm labor and services. In 1900 agriculture accounted for the largest source of income and employment, and by the 1930s a prospering agriculture supported a small industrial base and a large export trade. The agricultural surplus obtained in part by the state and urban buyers from unequal price exchange with rural suppliers did not prevent rural living standards from rising because real farm income rose fairly rapidly. Nor did the rapid rural population growth initiated by colonial public health policies produce rising unemployment because new jobs in both agriculture and industry became available more rapidly than the number of job seekers.

The state developed agriculture by creating favorable conditions in which farmers found it increasingly profitable to supply more to the market. The colonial administration established research organizations and organized farmer associations to transmit a new farming technology to the villages. It improved marketing facilities and lowered transportation costs to encourage farmers to specialize and farm their land more intensively. Finally, the state passed new laws to give the farm family greater legal security and protection by which to plan production with more certainty. These activities involved using both carrot and stick tactics to promote agriculture: the state granted subsidies and technical assistance to farmers to coax them to change and improve their farming methods; the state also confiscated peasant land to establish sugar cane plantations and used strong police power to force farmers to plant crops desired by the Japanese.

Chinese family farming methods also slowly changed as first some enlightened farmers adopted new seeds, improved fertilizers, and better farming methods and then other villagers gradually followed suit. The average size farm rose only slightly over the period, and most farms typically averaged between one and two hectares in size. The major source of increase in farm production came from greater applications of modern farming input. Some families found farming increasingly profitable and made it their primary source of income, but for the majority, most of their income continued to originate from sources outside of agriculture. Certain land tenure changes gave new owners greater protection and security to manage their land with more certainty that their expectations would be fulfilled, but many traditional characteristics remained throughout the period. High tenancy continued to persist until the end of the period, and land distribution remained very unequal. In spite of these conditions landlords and tenants improved their living standards. Although a fundamental agricultural transformation took place, rural development occurred on a very uneven basis, influenced greatly by the population growth underway, the expansion of the market, and historical settlement patterns.

The Pattern of Agricultural Development

During the Ch'ing period farm production increased at a growth rate only slightly above that of population, and sometimes poor harvests barely produced sufficient food for the population and exports declined. After 1900 farm production began to increase at an even higher growth rate than achieved after 1860 when foreign trade commenced with the West, and rice and sugar exports to Japan grew more rapidly than at any previous time.¹ In Table 24, I present various growth rate indicators to show the general pattern of agricultural development for the period.

When the period is divided into two time spans of nineteen year intervals, the reader will observe that farm production grew more rapidly in the second period; crop production growth rate exceeded that of population for both periods.² If annual growth rates for special crops (sugar cane in particular) and food crops (mainly rice) are plotted on a graph, there are only four years when the annual growth rate became negative, and these instances corresponded to very poor harvest years. Therefore, in spite of continued harvest fluctuations, growth rates remained quite high and accelerated over time.

Rice, sugar cane, sweet potato, and the peanut accounted for about 80 percent of total cultivated land, but rice and sugar cane were the most important crops determining peasant

¹ Although rice and sugar exports fluctuated, by 1920 rice exports amounted to more than 100,000 metric tons compared to only 14,000 metric tons in 1901. See Bank of Taiwan, *Jih-chü shih-tai T'ai-wan ching-chi shih* [An Economic History of Taiwan Under Japanese Rule] (Taipei: Bank of Taiwan, 1957), I, p. 37.

² These same findings have been presented in the following studies of Taiwan agricultural development. Ramon H. Myers, "Taiwan," in R. T. Shand (ed.), *Agricultural Development in Asia* (Canberra: Australian National University Press, 1969), pp. 29, 32; Ramon H. Myers and Adrienne Ching, "Agricultural Development in Taiwan Under Japanese Rule," *The Journal of Asian Studies*, 23:4 (August 1964), pp. 556-557; S. C. Hsieh and T. H. Lee, *An Analytical Review of Agricultural Development in Taiwan—An Input-Output and Productivity Approach* (Taipei: Joint Commission on Rural Reconstruction, 1958), p. 29; Samuel Pao-San Ho, "Agricultural Transformation Under Colonialism: The Case of Taiwan," *The Journal of Economic History*, 28:3 (Sept. 1968), p. 315; Yhi-Min Ho, *Agricultural Development of Taiwan 1903-60* (Nashville: Vanderbilt University Press, 1966), chs. 7 and 8. The crop statistics collected by the Japanese governor-general office as early as 1901 and 1902 appear to be reasonably accurate and representative of farming conditions of that period. The land survey and land tax reform virtually uncovered all unreported land previously untaxed.

income. Rice ranked first in terms of cultivated area, but sown area declined somewhat before 1920 as sugar cane area increased. Even in 1900 crop yields, especially for rice, appear to have exceeded yields in mainland China for the same period and for most southeast Asian countries as late as 1950.³ After 1900 the trans-island railroad and closer commercial ties

TABLE 24. GROWTH INDICATORS FOR THE AGRICULTURAL SECTOR
(Annual averages, compounded, in percentages)

Indicators	1901-05 to 1916-20	1921-25 to 1936-40
Total farm production	2.57	3.02
Rice cultivated area*	1.35	1.47
Rice yield	0.55	1.84
Rice output	1.88	3.30
Sugar cane cultivated area*	12.43	0.92
Sugar cane yield	0.22	4.82
Sugar cane output	12.63	6.04
Agricultural population	0.74	1.60
Total population	1.30	2.39

*Includes double cropping.

Source: Relevant indices were compiled for the above from which growth rates were then calculated by use of growth rate tables. Data for constructing indices were obtained from Taiwan sōtokufu (Taiwan governor-general), *Taiwan sōtokufu tōkeisho* [Statistical Abstract of the Governor-general of Taiwan] (Taipei, 1897-1940).

with Japan increased market demand for farm products and encouraged peasants to cultivate more land. Before 1920 most farm output growth originated from the expansion of cultivated land and only modest increases in yield occurred as seen in Table 24. After 1920 the expansion rate of cultivated area slowed considerably, and yield increases began to account more for output growth. In the case of sugar cane, for example, the cultivated area expanded at less than 1.0 percent per annum while yield increased above 4 percent; the same pattern characterized rice production.⁴ At the same time the yield differences between regions, formerly quite great, began to narrow slightly as more advanced farming practices were adopted in areas

³ Teng-hui Lee, *Intersectoral Capital Flows in the Economic Development of Taiwan, 1895-1960* (Ithaca: Cornell University Press, 1971), p. 38. Between 1908-1912 the rice yield in Taiwan exceeded that of Korea by 13 percent but it was still 46 percent of the rice yield of Japan. See Pin Juh, "T'ai-wan nung-yeh chih t'e-cheng" [Special Characteristics of Taiwan Agriculture], in Bank of Japan, *Jih-chū shih-tai T'ai-wan ching-chi chih t'e-cheng* [Special Characteristics of the Taiwan Economy Under Japanese Rule] (Taipei: Bank of Taiwan, 1957), p. 65.

⁴ R. H. Myers, "Taiwan," p. 33. Even Japanese agricultural experts as early as 1912 recognized that their policy had not successfully increased yield, and some seriously wondered if agricultural development had begun to take place at all in Taiwan. See Fujine Yoshiharu, "Taiwan nōgyō wa shimpō shitsutsumeru ka" [Has There Been Any Progress in Taiwan's Agriculture?], *Taiwan nōjihō*, 62 (January 1912), pp. 1-15. A brief word about the important periodical *Taiwan nōjihō* or *Taiwan Agricultural Review*. The monthly report of the Taipei Agricultural Experimental Station contains a series of studies, reports, essays, and statistical series on agricultural policy and progress in Taiwan and the Far East. The chief experts in the colonial administration frequently wrote for this review, and both the style and content indicate an intense desire upon the part of the Japanese to upgrade the agricultural performance on the island and to make it a virtual showcase of success for other colonial powers to see. Consequently, most articles explore and question existing procedures in a feverish search to solve problems and get Taiwan agriculture moving. There is perhaps no better source material to follow the progress and tribulations of agriculture than this review. After the mid 1920s the review became increasingly technical and truly representative of a typical agricultural experimental unit merely seeking to publish its best results.

of greater backwardness.⁵ Broadly speaking, agriculture first developed mainly on the basis of greater land utilization with only moderate improvement in yields, and then progress became more rapid as farmers combined extensive and intensive farming practices.

Farm products made up the bulk of exports to Japan, and rice and sugar accounted for the highest share of export value of any two products. In 1910 rice exports came to 104,000 metric tons, or 17 percent of total rice output; in 1930 rice exports had trebled to occupy 30 percent of total rice output. Finally, by 1937 rice exports reached 692,000 metric tons to account for half of the total rice output. This great increase in rice exports took place at first without any reduction in domestic per capita consumption of rice, but by the mid 1930s after population had nearly doubled, rice consumption fell.⁶ In the case of sugar, total sugar cane production trebled between 1910 and 1937, exports increased in the same proportion, and domestic per capita sugar consumption slowly rose.⁷

What principally accounted for this remarkable growth in farm output? Recent econometric studies have shown that until the early 1920s the substantial expansion of conventional inputs such as land, labor, and capital comprised of irrigation facilities, tools, labor animals and fertilizer accounted for the additional output produced.⁸ After 1920 an increasing proportion of output increase can no longer be explained by the expansion of physical inputs alone, as nearly one fifth of the new output growth bore no relationship to these inputs. This unexplained output represented the contribution of new technology, such as the application of scientific methods and adoption of new capital. The statistical methods to isolate and measure the contribution of technology are crude, and the reader should not form the impression that only after 1920 did new farm technology begin to influence output expansion. Long before 1920 the quality of capital used by farmers had slowly begun to change as farmers used new seeds requiring different planting schedules, fertilizing methods, plant care procedures and irrigation. This new technology, at first, only affected the main crops of rice and sugar cane, and then farmers later applied it to other crops.

An agricultural surplus can be transformed into capital goods through exports in which capital goods are directly imported and used in domestic production and through "workers increased consumption in the non-agricultural sector, which leads to the production of capital goods."⁹ The measurement of such intersectoral and international flows is difficult to make on both conceptual and accounting grounds. Lee Teng-hui's recent study presents both a concep-

⁵ Ramon H. Myers, "Agrarian Policy and Agricultural Transformation: Mainland China and Taiwan, 1895-1945," *The Journal of the Institute of Chinese Studies of The Chinese University of Hong Kong*, 3:2 (Sept. 1970), p. 528. Very low yield areas in the early period rapidly achieved high yields by the late 1930s as seen in the case of the groundnut for Tainan prefecture.

⁶ R. H. Myers, "Taiwan," p. 33. Between 1912 and 1922 rice availability per person rose from 1.084 to 1.236 *koku* or about 14 percent. See Iwaki Kamehiko, "Hontō saikin jūnika nenkan no kome no seisan yuishutsunyū narabi ni shōhi chō" [A Survey of Rice Production, Imports and Exports of Rice, and Rice Consumption in Taiwan During the Last Twelve Years], *Taiwan nōjihō*, 36:3 (March 1924), p. 46. Between 1907-11 and 1935-39 rice consumption per capita fell from 1.165 to 0.895 *koku* or a 26.3 percent decline. See Ishikawa Shigeru, Shinohara Miyohei and Mizoguchi Toshiyuki, "Senzen ni okeru Taiwan no keizai seichō," *Keizai Kenkyū*, 20:1 (Jan. 1969), p. 49. One possible reason for this decline is that farmers preferred to market rice, a profitable cash crop, and eat home grown potatoes and vegetables. As the economy had already moved onto a wartime footing, various forms of taxation might very well have made it impossible for farmers to have done otherwise.

⁷ R. H. Myers, "Taiwan," p. 27.

⁸ Samuel Pao-San Ho, *op. cit.*, pp. 322-326; Yhi-Min Ho, *op. cit.*, pp. 64-65; see also the recent debate between Samuel Ho and Yhi-Min Ho on the veracity of input measures to determine the residual output change to be associated with technological change in *The Journal of Economic History*, 31:3 (Sept. 1971), pp. 672-639.

⁹ Teng-hui Lee, *op. cit.*, p. 15.

tual framework and estimates of how this surplus was transformed and contributed to real capital formation in Taiwan's economy. Lee defines net real capital outflow as the financial amount of capital outflow from agriculture in real terms and the amount of capital outflow caused by the change in the sectoral terms of trade between agriculture and non-agriculture.¹⁰ He estimated this net real capital outflow to have increased at a rate of 3.8 percent between 1911–15 and 1936–40.¹¹ Much of this outflow represented the flow of export surpluses to Japan, so that Taiwan contributed significantly to Japan's industrial development. At the same time the saving to income ratio in agriculture also increased considerably.¹² Lee's empirical findings strongly indicate that a policy toward improving agriculture in the initial phases of development produces a high pay-off for the economy by agriculture financing capital formation in both the agricultural and non-agricultural sectors of the economy.

The State and Agricultural Development

The Japanese had already achieved considerable success at home by using the power and wealth of the state to advance agricultural prosperity. They simply applied the experience learned at home to their new colony, and where circumstances dictated, used policy power to speed implementation of these policies. The state can introduce new innovations which will increase the efficiency of management and commercial transactions of farmers and mobilize resources to improve markets so that farmers will specialize and increase their production for the market. For example, the state might pass new laws redefining property rights and making provisions for private property, especially land, to be valued and exchanged more conveniently. The institutionalization of private property encourages the entry of new producers into agriculture whereby more land will be bought and sold. The new laws guaranteeing protection for the fruits of farm family labor and investment then make possible greater certainty for producers to plan their economic activities.

Then again, the state might allocate more funds from its budget to build new roads, railways, harbors and warehouses. Farming areas previously denied access to large domestic markets and overseas buyers suddenly find their products can be sold at attractive prices irrespective of the amount they supply. The state can legislate to standardize weights and measures and marketing procedures. Such reforms enhance market competition between buyer and seller and gives both parties greater certainty to plan their production and sales. The state can also spend to establish research centers and agencies to promote the study and encouragement of more scientific farming practices. Such efforts include the importing of high yield seeds from other countries, adapting them to local conditions, and distributing them cheaply to farmers. These agencies also make available new capital for farms such as chemical fertilizer, tools and irrigation facilities. Finally, the state might improve the quality and efficiency of the rural work force by eradicating disease through new public health measures, increasing literacy and knowledge by establishing schools, and upgrading farming practices by experts providing technical advice. Other forms of assistance from the state are better weather forecasting, granting aid to areas hit by natural disasters, and giving low cost credit.

While the state can use its power to improve greatly the efficiency and prosperity of agriculture if it so desires, it can also expropriate income from agriculture to use for other

¹⁰ *Ibid.*, p. 12.

¹¹ *Ibid.*, p. 28.

¹² *Ibid.*, pp. 15–16.

purposes. By increasing taxes and pricing its products at terms preferential for itself, the state can squeeze agricultural producers. It can also force farmers to work at non-farm tasks for low wages or zero rewards. Finally, the state can expropriate certain resources from farmers at zero cost and then hire labor to use these resources at terms lower than what farmers would probably have received had they used these resources themselves. The Japanese colonial administration used all of these methods to extract surpluses from Chinese agriculture between 1900 and 1910, but on balance, farmers ultimately benefitted from this strategy because the broad gains received by farmers still exceeded their costs. While the Japanese invested heavily to develop Taiwan's agriculture, they took special care not to destroy traditional rural institutions and guaranteed their continuation as long as they ruled Taiwan.

Until 1897 the Japanese continued to collect the land tax in the traditional manner, and then the administration issued an ordinance announcing a land survey to compute land values for tax purposes. The survey began in 1898 in the Taipei area, quickly extended to I-lan and Taichung, and finally encompassed Tainan in 1903. The Japanese spent 3 million yen or 18 percent of all extraordinary expenditures made during these five years.¹³ The land survey identified ownership and produced information on the harvest, basic farming costs and interest rates to estimate land value.¹⁴ A key problem remained: what to do with the former *ta-tsu* households who still claimed tracts of land but really did not work their land? From studies of Taiwan's social and legal customs, the Japanese already knew this class depended on its hereditary rents and still possessed considerable power in local communities. Rather than forcibly take away their land rights for fear the *ta-tsu* might undermine administrative rule at a critical time when the Japanese wanted to intensify their control over the island, the administration sought to accommodate the *ta-tsu* by obliging them to exchange their hereditary rents for income bearing bonds.

The survey uncovered 39,799 *ta-tsu* families.¹⁵ In July 1904, a special committee calculated bond values and interest payments by valuing annual rent in kind to *ta-tsu* at current market prices for main crops. The old land tax was deducted from this estimate, leaving a residual which became the basis for computing bond compensations. In February 1905, district offices began issuing bonds of seven denominations to total eventually 3,779,479 yen. "These bonds represented the injection and circulation of a huge amount of money into the economy."¹⁶ Some *ta-tsu* used their bonds to invest in new enterprises; others used them to establish banks

¹³ Ōkurashō (ed.), *Meiji Taishō zaisei shi* [A History of Meiji and Taishō Finance] (Tokyo, 1958), Vol. 19, p. 198; Cheng Chia-ying, *T'ai-wan t'u-ti chih-tu k'ao-ch'a pao-kao shu* [An Account of the Survey Report of the Taiwan Land System] (Taipei, 1905), p. 142; Wang I-t'ao, *T'ai-wan chih t'u-ti yu t'u-ti cheng-ts'e* [The Land System and Land Policy in Taiwan] (Taipei: Bank of Taiwan, 1964), pp. 27-30. The land survey and land tax reform produced the following changes.

	<i>Before Liu Ming-ch'uan's survey</i>	<i>After Liu Ming-ch'uan's survey</i>	<i>Before Japanese land survey</i>	<i>After Japanese land survey</i>
Land area	ca. 70,000 <i>chia</i>	ca. 290,000 <i>chia</i>	ca. 361,000 <i>chia</i>	ca. 777,000 <i>chia</i>
Land tax	ca. 180,000 taels	ca. 690,000 taels	ca. 920,000 yen	ca. 2,900,000 yen

¹⁴ Sufficient information was obtained to calculate land values by estimating net income from land and dividing by prevailing interest rates on a single year's basis. By capitalizing land values in this fashion, the administration fixed a rough value to land, drew up a land deed with the owner's name, and compiled land cadastre maps in which all owned land was identified and valued according to different grades and uses. See Taiwan sotokufu minseibu zeimukyoku, *Taiwan zeimushi* [A History of Taiwan Fiscal Affairs] (Taipei, 1918), Vol. 1, pp. 104-105.

¹⁵ *Meiji Taishō zaisei shi*, p. 217.

¹⁶ *Ibid.*, p. 230.

in Chia-i and other districts; finally, still others, either out of ignorance or financial distress, sold their bonds below par value. Even though the administration instructed the central bank and its subsidiaries to loan at low interest terms to *ta-tsu* to encourage them to hold their bonds, these stop-gap measures failed to prevent the premature sale of bonds.

Meanwhile the procedures for calculating the land tax were given to district officials in November 1904.¹⁷ They levied the new tax on paddy, field, fish pond land and forest areas. Land ownership now reverted to the former *hsiao-tsu* who always had been the real farm operators although many had leased land to tenants. They commenced to pay the new land tax in full. The new land tax ordinance guaranteed rights of property security, transfer and inheritance for land owners. It also enabled the tax office to collect taxes easily as owners and their land values were identified from cadastre maps. Taxes were not altered until February 1915 when land used for livestock was taxed according to rates applicable for the three major land classifications. Another land survey took place in 1917 to reassess land values and upgrade taxes to take into account rising land values. In spite of this new increase in land tax burden, a considerable time lag had elapsed in which landowners profited from the appreciation of land values and increased productivity.

The land tax reform produced three major results. First, the survey had uncovered additional untaxed land which quickly yielded the state considerable tax revenue. Second, the elimination of the *ta-tsu* class greatly simplified the land tenure system, and the actual holders of the land came to possess title deeds showing their land, its value and the tax to be paid. The reform protected these land holders who found it more convenient and simple to buy and sell land. Finally, the reform impressed upon the cultivator the necessity to make the land productive as the state collected taxes with firm regularity.¹⁸ The fixed tax, scrupulously but honestly collected, still left profit for the managerial farmer.

In 1899 the Japanese government gave the Osaka Commercial Shipping Company special monopoly rights to handle all shipping between Taiwan and Japan. The Tamsui port had always silted and could not accommodate large ocean vessels. Therefore the administration set to work that same year to dredge and construct a new harbor at Keelung. In 1902 the new harbor began receiving more ships, and thereafter exports from the northern districts rapidly increased. Construction then began on Kaohsiung harbor in 1908 and ended in 1912. Building of both harbors cost 7.1 million yen. To link these harbors to the interior the administration began rebuilding the railway line between Keelung and Taipei. Railway construction began in May 1899 and by April 1908 a line passed through Taipei, Taichung, Chia-i, Tainan and ended in Kaohsiung to extend 247 miles and cross extremely difficult terrain often requiring many tunnels and bridges of considerable length. This project cost the administration 27.5 million yen. By 1910 an additional 586 miles of small-gauge railway line had been built to enable sugar mills to ship their sugar cane and processed sugar to either Keelung or Kaohsiung. By 1906 the revenue earned from this railroad system by hauling freight exceeded passenger earnings, and this trend continued thereafter.¹⁹ Between 1899 and 1908 the revenue from passengers and freight on a mile per day basis nearly doubled. For the same period total railroad earnings increased eightfold while expenditures only rose by three and a half fold.

¹⁷ *Ibid.*, p. 236.

¹⁸ Japanese agricultural experts were quite convinced that the land tax reform had promoted a new "capitalist" mentality among farmers and tenants. For this kind of argument see Moyoshi Shirō, "Taiwan chisō shi koron" [A Short Essay on the History of Taiwan's Land Tax], *Taiwan nōjihō*, 315 (Feb. 1933), pp. 98-112.

¹⁹ Taiwan sōtokufu tetsudōbu (The Railway Department of the Government General of Taiwan), *Taiwan tetsudōshi* [A History of the Taiwan Railway] (Tokyo, 1911), Vol. 3, pp. 308-309.

Such a growth in freight earnings and railroad profits merely reflected the favorable impact this transport and new harbor system had upon agriculture by making it possible for the marketed surplus to increase greatly.

The administration first turned its attention toward making the sugar cane industry profitable. To increase sugar cane output it created in June 1902 a Provisional Taiwan Sugar Affairs Bureau to research and improve production by producing and distributing new seeds and instructing peasants in their proper use. These efforts took hold quickly as marketing opportunities expanded for farmers and the land tax reform encouraged more production for the market. Between 1902–03 and 1912–13 sugar cane cultivated area using new seeds from Hawaii jumped from 16,526 to 67,358 *chia*, cane output more than doubled, and yield rose gradually.²⁰ In 1911 and 1912 typhoons nearly destroyed the cane harvest when a stalk disease broke out in the storms' aftermath to spread rapidly throughout the southern districts.²¹ The Bureau quickly imported new seeds from Java and distributed them to save the industry from certain disaster. By 1918–19 cultivated cane area with the new Java seed climbed to 150,450 *chia*, output amounted to about 4 million metric tons, and yield per *chia* stood at 2,490 kilograms as compared to only 1,840 kilograms in 1902–03. Research stations continued to introduce new seed varieties, and between 1927 and 1933 output averaged around 5 million metric tons per year; but by 1937 output rose to 8.5 million metric tons, well above the level predicted by General Kodama nearly four decades before. As a result, in 1939 the industry occupied a dominant position in agriculture: out of 400,000 farms, 120,000 specialized in sugar cane; approximately one-fifth of all farm land grew sugar cane; about 16 percent of the annual farm production value came from sugar cane.²² Even the island's small industry base depended greatly upon new sugar mills: of total factory production value averaging 360 million yen in 1938–39, about 60 percent was accounted for by sugar; finally, two-fifths of export value originated from sugar.²³

Agricultural economists working in Taipei's Agricultural Experimental Research Station admitted that without the full power of the state to promote agricultural development, the actual pace of agricultural progress would have been much slower. Tōgō Minoru, who spent many years studying and advising the colonial administration on agricultural policy, assessed the state's role as follows.²⁴

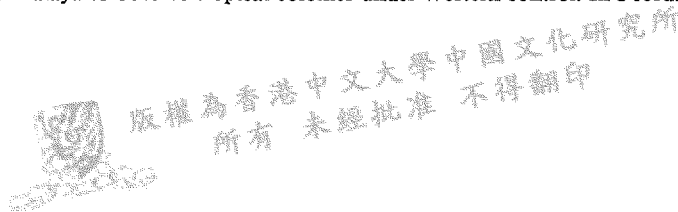
²⁰ Taiwan sōtokufu shokusan kyoku, *Taiwan no tōgyō* [The Taiwan Sugar Industry] (Taipei, 1929), pp. 10–11. The *chia* equals 2.471 acres or roughly a hectare. For a good discussion of the diffusion of new sugar cane seeds, see Tanaka Kazuji, *Taiwan sangyō sōran* [A Survey of Taiwan Industries] (Taipei, 1919), p. 71; Satō Seizō (comp.), *Kairei yonjūnen no Taiwan* [Taiwan After Forty Years of Reform] (Taipei, 1935), p. 179; Chang Han-yu, "Jih-chū shih-tai T'ai-wan ching-chi chih yen-pien" [The Transformation of the Taiwan Economy During the Period of Japanese Rule], in *T'ai-wan ching-chi shih erh-chi* [Essays on Taiwan Economic History: no. 2] (Taipei: Bank of Taiwan, 1955), p. 80.

²¹ Japanese agricultural experts warned that cultivating sugar cane north of Hsinchu would be unprofitable, and they tried to discourage in particular the cultivation of rose bamboo seed from Hawaii in the northern districts. A stronger type seed was required for this area because of colder climate and strong winds. See Hemmi Gyō, "Taiwan hokubu kanshosaku ni taisuru iken" [One View Concerning Sugar Cane Cultivation in Northern Taiwan], *Taiwan nōjihō*, 79 (June 1913), p. 511.

²² *Taiwan no tōgyō*, p. 21.

²³ *T'ai-wan sheng wu-shih-i-nien lai t'ung-chi t'i-yao*, pp. 946–951.

²⁴ See Tōgō Minoru, "Nōji kairyō kumiai ni sōsetsu ni tsuite" [The Establishment of Organization for the Improvement of Agriculture], *Taiwan nōjihō*, 152 (July 1919), p. 395. Tōgō Minoru first came to Taiwan in February of 1906. He remained there until March 1909 when he visited Germany to spend two years at the University of Berlin studying colonial policy and agriculture under Professor M. Sering. In May 1912, he returned to Taiwan and worked there until November of the same year. He then took a field trip to the Philippines, Hong Kong and Malaya to observe tropical colonies under Western control. In February 1913 he



To introduce new farm products in Taiwan when the existing level of agricultural knowledge was so low, the state had to take the lead to improve agriculture and bring about progress. Therefore, it has been necessary in the past for the government-general and prefectural officials to play an important managerial role to bring about the agricultural progress which we can observe today.

The key organization the state created to mobilize farmers to develop agriculture was the *nōkai* or farmer association. Odashiro Keitarō believed that the Japanese "were unable to use state power to unify the administration and people until *nōkai* had been established in every district."²⁵ In September 1900 the first farmer association was created in San-chiao-yung of Taipei prefecture, and in April 1901 another was established in Ho-shang-chou of Hsinchu prefecture.²⁶ Both were dissolved several years later, but after 1903 farmer associations again began to appear throughout the island.

In 1908 the government passed ordinance 70 clarifying the objectives and activities of these associations. The typical farmer association evolved and operated as follows. First, prefectural officials singled out enterprising landlords and wealthy farmers and instructed them to organize a farmer association. They granted subsidies to the new association to enable it to buy some land, erect a building and get a start. Second, each member paid dues and elected a manager and small staff to keep accounts and manage its affairs. In 1902 these associations spent only 1,496 yen, by 1907 the amount had risen to 103,676 yen, and by 1913 annual outlays exceeded 400,000 yen.²⁷ Third, the association maintained close ties with the prefectural agricultural experimental station which gave it new seeds and farming advice. Fourth, the association frequently convened to discuss farming problems and kept small experimental plots to plant crops and show other farmers how new seeds worked. Finally, the association made every attempt to pass its new knowledge to other farmers and their tenants. By the late 1920s these associations had become large, more numerous, and engaged in diverse activities such as purchasing fertilizers, lending credit, and experimenting to improve livestock and special crops like fruits and vegetables.

The colonial administration also established various agricultural experimental stations to carry out scientific research of the island's agriculture in order to initiate a "green revolution." This system was aptly described in a report by a group of Chinese students from an agricultural school in Fukien who toured Taiwan in December of 1915. The head of the Taipei Agricultural Experimental Station, Director Suzuki, met the students and described the organization of agricultural research as follows.²⁸

again returned to Taiwan to write a book on his travels and observations. The intent of this work was to discuss how a new colonial policy might be initiated in Taiwan. In 1914 he published his *Taiwan nōgyō shokumin ron* [Essays on Taiwan's Agricultural Colony] in Tokyo, in which he set forth his general views on this subject. In essence, he argued that more Japanese should be encouraged to migrate to Taiwan and develop agriculture. Taiwan possessed ample land, and the new migrants would bring with them sufficient capital and advanced farming skills to revitalize Taiwan agriculture. Gradually, Chinese farmers would learn from these new farmer colonists, and agriculture would begin to prosper. He hoped that ultimately Taiwan might achieve an independent status so as to be organized on a commonwealth basis. Tōgō was probably one of the most influential officials in the colonial administration; at least he was one of the most articulate. In this writer's opinion, he not only influenced the administration's farm policy, but educated an entire generation of experts to guide and shape colonial agricultural policy.

²⁵ Odashiro Keitarō, "Hontō nōmin no shidō" [Guiding Taiwan's Farmers], *Taiwan nōjihō*, 74 (January 1913), p. 1.

²⁶ Taiwan shokusan kyoku nōmuka (Agricultural Affairs Section of the Bureau to Promote Enterprise in Taiwan), *Taiwan nōkai yōran* [A Survey of Farmer Associations in Taiwan] (Taipei, 1933), pp. 1-2; see also Yamaguchi Jo, "Taiwan no nōkai" [Taiwan Farmer Associations], *Taiwan nōjihō*, 100 (March 1915), pp. 84-88.

²⁷ *Taiwan nōkai yōran*, pp. 165-166.

²⁸ See the commentary by Liu Fan-cheng in *Tai-wan lü-hsing chi* [Diaries of a Tour in Taiwan] (Taipei, 1965), pp. 49-50. This study contains three reports by students who took this tour in late 1915 and early 1916.

This agricultural experimental station was established in 1898 with the following departments: a Department of Plants which specialized in the study of seeds; a Department of Agricultural Chemistry for the study of soils, fertilizers, and maturation of crops; a Department of Plant Pathology for the study of plant diseases and pests; a Department of Sericulture for research into the raising of silkworms; a Department of Livestock for the research of raising and improving livestock. Aside from these departments, there is the Department of Agricultural Instruction for teaching agricultural science and experimentation which now has two hundred students. There is also a Department of General Affairs which manages the station's operations, its library, accounts, and other miscellaneous affairs. Each year this Department presents an annual report of the Station's activities. In addition to the Taipei Agricultural Experimental Station, there are the Taipei Forestry Experimental Station and Horticultural Experimental Station. In Chia-i and Heng-ch'un there are Forestry Experimental Sub-Stations. Tainan has a Sugar Experimental Station; An-p'ing city has a Tea Experimental Station. In each prefecture of the island there are Offices for the Promotion of Industry, and each area has a farmer association. All of these agencies are responsible for the development of agriculture. Taiwan's agricultural progress must be attributed to these institutions.

These experimental stations were supposed to transmit their basic results and provide advice to the farmer associations and local officials for encouraging widespread farmer adoption of new farming procedures, seeds and modern farming inputs. It is not clear how efficient this organizational structure operated to transmit quickly the new results learned in the laboratory and experimental plots, but the important fact remains that a fairly elaborate structure had been established by 1910 to perform this very function. The administration also sponsored landlord associations and farmer fertilizer cooperatives in the late 1920s and early 1930s.²⁹ Finally, in the later decade it also began to establish village cooperatives on a small scale, but this movement never became widespread.

In three ways this formal system of research and dissemination promoted a major biological revolution in farming. It made available high yield seeds resistant to disease and less sensitive to severe climatic fluctuations. It supplied organic fertilizers, and even more important, it educated farmers to grow green manure crops and practice correct crop rotation. Finally, it encouraged new irrigation facilities and flood control where rice and sugar cane flourished. A good example of such activities can be found for Hsinchu prefecture, a very poor and backward farming area in the north.

In 1920 T'ao-yuan and Hsinchu prefectures were combined to form the large prefecture of Hsinchu. Hsinchu prefecture, located south of Taipei and north of Taichung prefectures, supported principally agriculture and forestry on a plateau considerably above sea level. By 1935 Hsinchu ranked third among Taiwan's prefectures in annual rice exports to Japan in which her share amounted to 20 percent. Rice, tea and citrus fruits made up the main crops grown; rice alone accounted for three-quarters of total farm production.³⁰ In 1908 two farmer associations were established in T'ao-yuan and Hsinchu respectively. The principal objectives of these associations were to develop rice production, improve the tea farms, and upgrade quality and increase the supply of pigs and buffalo. In addition to these agricultural concerns, the local administration instructed the local farmer associations to reforest more land and take steps to eliminate cattle disease. Then in 1915 a serious disease broke out in the region. The Japanese immediately created an organization specifically designed to eliminate this disease and save the buffalo. By 1920 these measures had successfully saved most of the live-

²⁹ Murayashiro Shin, "Shōrai ni okeru jinushikai no jigyō" [The Activities of Landlord Association in the Future], *Taiwan nōjihō*, 157 (Dec. 1919), pp. 707-709; Suzuki Shinichirō, "Saikin kakushū nōkai hiriyō kyōdo kōbai jigyō ni tsuite" [Concerning the Recent Activities of Cooperative Fertilizer Purchases by Prefectural Farmer Associations], *Taiwan nōjihō*, 175 (June 1921), pp. 240-251.

³⁰ Sugano Hideo, *Shinchūkushū enkaku shi* [A Brief History of Hsinchu Prefecture] (Hsinchu, 1938), p. 387.

stock in this prefecture, and the organization amalgamated with the Hsinchu agricultural association which had been just established as a result of new prefectural boundaries.³¹ In 1908, the agricultural associations in T'ao-yuan and Hsinchu only spent about 25,000 yen, but in 1920 these outlays had reached 110,000, and five years later they came to 240,000 yen.³²

The island-wide program to increase rice production involved in two stages. In the first phase, commencing around 1911-12, agricultural associations began instructing farmers to use only certain local varieties which agricultural research stations had selected amongst the many hundreds of native varieties. In the next few years these associations progressively reduced the number of high yield local varieties which peasants were supposed to plant in their rice fields. At the same time these same associations encouraged farmers to cultivate green manure crops after each rice harvest before using the land for cultivating other crops.³³ While farmers had always practiced crop rotation, they had not interspersed green manure crops between different crops cultivated on the same unit of land.

The second phase of rice development began in 1922 when a new seed variety, the *p'eng-lai* or *horai*, was introduced in Hsinchu prefecture. This rice seed originally came from Japan, and Japanese agronomists had already spent more than five years researching to adopt the seed to Taiwan's soil and climate. Finally, success came in 1921-22 when new procedures for prolonged soaking of these seeds were developed in the Hsinchu agricultural experimental station.³⁴ At first the cultivated area for new *p'eng-lai* rice in 1922 amounted to only 14 *chia* that produced 184 *koku*. *P'eng-lai* was a type of rice which Japanese consumers greatly preferred, and which the Chinese would only acquire a taste for during the early 1940s when rice for local consumption became very scarce. By 1924 the cultivated area for *p'eng-lai* had risen to 3,286 *chia* and continued to climb thereafter as other varieties of *p'eng-lai* were rapidly developed and introduced. By 1935 Hsinchu prefecture farmed 76,181 *chia* of *p'eng-lai* compared to 45,407 *chia* of the traditional native glutinous variety.³⁵

The skeptical reader still skeptical of the powerful impact this system of agricultural research and dissemination had upon Taiwan's agriculture will perhaps appreciate its importance by the observations of Chinese students from Fukien who expressed their great astonishment over the rural progress achieved by the Japanese after occupying the island for only two decades. Topography, climate, and farming conditions in Taiwan closely resembled those of Fukien province, except for the important difference of the state created infrastructure of agricultural research and transmission to farmers. An agricultural student from Fukien named Liu Fan-chang visited the Taichung experimental research station in late 1915 and was amazed to discover that certain plants native to Kwangtung province were being cultivated in the experimental gardens. Japanese personnel informed him that because Japan had spent 2 million yen annually to import these plants from China, they decided to cultivate these in Taiwan in order to save foreign exchange. Liu's anguished reactions appeared in his diary as follows.³⁶

³¹ *Ibid.*, p. 658.

³² *Ibid.*, pp. 660-661.

³³ *Ibid.*, p. 387.

³⁴ Furusawa Shigesaburō, "Naichishū suitō no hatsuga chikan ni kansuru kenkyū" [Research on Late Germination of Japanese Rice Seeds], *Taiwan nōjihō*, 120 (November 1916), pp. 858-864.

³⁵ Sugano Hideo, *op. cit.*, pp. 392-393. Among the new *p'eng-lai* varieties rapidly introduced were Taichung no. 65, late *chia* no. 2, and the *aikoku* or "to love one's country" variety.

³⁶ Bank of Taiwan Economic Research Office, *Tai-wan lü-hsing chi*, p. 26.

Japan's success; our misery! Japan no longer spends two million yen, but China loses two million yen. If China's major industries are not improved, then we will see our wealth dissipated day by day. The people will live in poverty, and the future will be too unbearable to consider. Might this not come about because of examples like these Kwangtung plants?

Liu was lamenting his country's missed opportunities, which the Japanese had seized and capitalized upon by means of research stations and farmer associations.

Family Farm Economic Organization and Behavior

The Taiwanese rural family, irrespective of its size, status and wealth, practiced ancestor worship. Household members extolled their ancestors privately in their homes and publicly in their village and town temples. Ancestor worship subsequently shaped and influenced the behavior and outlook of each family member and enabled the family to operate and function as a corporate unit seeking material comfort, economic security and social prestige. The family pursued these goals to bestow greater glory to its ancestors. A family which had achieved wealth and considerable size, thereby possessed the necessary leverage to realize these goals and perform appropriate ancestor worship rites. The attitudes which parents tried to inculcate in their children toward the accumulation of wealth were extremely important.

Chinese parents reared their children to be hard working, frugal, make efficient use of their available time, and accumulate wealth. These habits were acquired by children at an early age, and upon reaching adulthood, they in turn educated their children in the same values and attitudes toward work, use of income, and accumulation. Sagura Magozo, a Japanese policeman who lived in Taiwan for three years at the turn of the century, wrote some vivid recollections of Taiwanese customs and life styles which confirm the assertion made above.³⁷

The idea of amassing wealth for the Taiwanese is in accord with their natural temperament. From youth to old age they undertake any small task, manage it well, work diligently to accumulate, and successfully manage their various activities. The habit of making the best use of their time is ingrained in them at this time. A lad of seven or eight years of age will pick fruit, place it in a basket, and sell it in the streets; he might collect fuel to help out in the household. When he is fully grown, these habits enable him to prosper and be strong in determination. This sort of behavior toward amassing wealth is rare even amongst people who practice highly enlightened procedures for accumulating wealth. For the most part the Taiwanese collect their silver in bags, store these in jars, or they melt their silver into many small bars and store in holes as security against some future disaster. Although such behavior seems to be perverse, what do we really know about this activity of wealth accumulation? To be sure, it can produce people who are enormously wealthy and yet are extremely hard working. Even the low and poor classes which struggle to live are skilled at accumulating small hoards.

During the Ch'ing period the ideal sought by every Chinese family, but realized by only a few, was the joint family form of several sons and their families living under one roof with the parents. Information concerning the rural social structure during the period of Japanese rule is still very fragmentary, and the subject has not yet been researched very deeply, but family farm survey evidence collected during this period strongly suggests that even in villages which had achieved considerable prosperity and experienced long term stability, only a few families ever became large enough and sufficiently wealthy to achieve joint family form. Let us consider the representative cycle which most families strived to follow but which few in their life history achieved.

The ability of a nuclear family to expand its size and accumulate wealth depended upon

³⁷ Sagura Magozo, *T'ai-feng tsa-chih* [Miscellaneous Notes on Customs in Taiwan] (Taipei, 1961), p. 37.

the number and sex of children and the managerial capabilities of the household head. A nuclear family of only girls could not achieve stem form unless it adopted a male for marriage with a daughter (uxorilocal marriage). Such a family might give one or more of its daughters to other families to raise as child brides for their sons. Families used different strategies of giving or receiving daughters or sons of different age in order to establish a stem family or guarantee continuation of the family line. The household head had to possess organizational abilities and good health and be capable of performing arduous work. The process of accumulating wealth was difficult, and often random occurrences such as illness, a favorable child adoption, and simply good economic fortune determined the probability of a nuclear family enlarging into stem form or declining and eventually disappearing from the village.

In the early phase the nuclear family still did not have its maximum labor power because a high percentage of persons were still under work age (around fourteen), and the population dependency ratio was high. In Table 25 below note those family population characteristics

TABLE 25. DEMOGRAPHIC PROFILE OF FAMILY FARMS BY SIZE CLASS

Type of farm	Farm size class (chia)	Average size (persons)	Average percentage of household members by age class			Average population dependency ratio*
			0-14	15-60	60 and above	
1. Sugar cane farms (28, 1931) ^a	Above 3.0	13.7	46.3	50.7	3.0	49.3
	2.9-1.1	11.3	40.7	57.5	1.8	42.5
	Below 1.0	8.8	41.9	53.2	4.9	46.8
2. Rice farms (50, 1931) ^b	Above 2.9	11.3	36.2	57.8	6.0	42.2
	2.8-1.0	9.3	38.2	58.1	3.7	41.9
	Below 0.9	8.2	44.4	50.5	5.1	49.5

*This ratio expresses the number of household members in age classes 0-14 and 60 and above as a share of total persons per household.

Source: Above data were arranged from the following two survey studies undertaken by the Shokusanryoku (Bureau for Promoting Industry) of the Governor-general's office.

^a Taiwan sōtokufu shokusanryoku, *Nōka keizai chōsa: shosaku nōka* [A Survey of the Family Farm Economy: Sugar Cane Farms] (Taipei, 1937).

^b Taiwan sōtokufu shokusanryoku, *Nōka keizai chōsa: beisaku nōka* [A Survey of the Family Farm Economy: Rice Farms] (Taipei, 1935).

for the smallest family farm class. At the same time the ratio of consumers to persons performing work was very high. This can be seen in Table 26 for families in the smallest family farm class size. As the nuclear family aged and the children matured to perform adult labor, the number of workers per family began to rise (Table 26) and the percentage of persons below the age of fourteen began to fall (Table 25). These children now earned more income for the household so that the family saving to income ratio rose, and the family could purchase some land. It is striking that family farms of larger size are positively correlated with a larger family work force, a declining consumer to worker ratio (Table 26), a falling population dependency ratio (Table 25), and higher income per farm family. The relationship between family farm income and farm size can be observed in Table 27. The gradual improvement in family fortune, as seen by its acquisition of more land, was also positively correlated with a shift from nuclear to stem family form. To be sure, many families might achieve stem form yet remain poor and have little land, thus crowding the ranks of the smallest family farm size class.

If the stem family evolved to joint family form (children are now born to one or more married couples living with their parents) the population dependency ratio again rose (Table

TABLE 26. SIZE CHARACTERISTICS OF PEASANT HOUSEHOLDS BY FARM SIZE CLASS

Type of farm	Farm size class (chia)	Average size (chia)	Persons (number)	Workers (number)	Non-workers (number)	Consumer to worker ratio
1. Rice farms (68, 1919-22) ^a	14.00-6.13	8.94	22.8	10.2	12.6	2.24
	6.12-4.91	5.62	13.9	7.6	6.3	1.83
	4.90-3.34	4.04	11.1	6.1	5.0	1.82
	3.33-2.38	3.04	8.4	5.1	3.3	1.65
	2.37-1.41	2.08	7.1	3.7	3.4	1.92
	1.40 and below average	1.05 4.12	8.3 11.9	3.5 6.0	4.8 5.9	2.37 1.97
2. Sugar cane farms (28, 1936) ^b	16.00-6.68	10.10	15.0	5.1	11.9	2.94
	6.67-5.01	5.97	12.8	5.4	7.4	2.37
	5.00-3.90	4.87	7.1	3.8	3.3	1.86
	3.89 and below average	3.00 5.98	8.5 10.8	3.8 4.5	4.7 6.3	2.24 2.35
	3. Rice farms (50, 1934) ^c	8.50-3.62	5.00	9.7	4.4	5.3
3.61-2.29		2.76	9.6	3.9	5.7	1.68
2.28-1.43		1.90	7.6	3.0	4.6	1.65
average		3.35	8.9	3.8	5.1	1.75

Source: Data above were collected from the following:

^a Taiwan sōtokufu shokusanryoku, *Taiwan nōka keizai chōsa* [A Survey of the Taiwan Family Farm Economy] (Taipei, 1923), p. 82.

^b Taiwan sōtokufu shokusanryoku, *Nōka keizai chōsa: shosaku nōka*, p. 41.

^c Taiwan sōtokufu shokusanryoku, *Nōka keizai chōsa: beisaku nōka*, p. 155.

25 for the largest farm size class), the consumer to worker ratio also began to rise (Table 26), and the number of persons per family increased (Table 26). At the same time, if the joint family farm had managed to acquire more land, its income per farm and per person rose still higher (Table 27 for the largest farm size class). There is a positive correlation between farm size and family structure, but it is not always neat or perfect. Different family farms can always be found within the same size farm class, but generally speaking the income and demographic patterns

TABLE 27. FARM INCOME BY FARM SIZE CLASS (JAPANESE YEN)

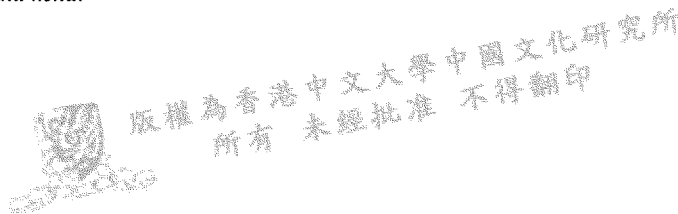
Type of farm	Farm size class (chia)	Average net income per farm	Average net income per person	Gross family farm income
1. Rice farms (67, 1919-22) ^a	14.00-4.00	1,226	116	2,922
	3.99-2.00	763	89	1,851
	1.99 and below	686	92	1,384
2. Sugar cane farms (28, 1936) ^b	16.00-6.68	3,780	252	9,091
	6.67-5.01	3,177	248	5,249
	5.00-3.90	1,177	250	3,688
	3.89 and below	1,190	140	2,990
3. Rice farms ^c	9.00-3.62	1,191	123	2,605
	3.61-2.29	711	74	1,471
	2.28 and below	527	69	1,117

Source: Data were obtained from the following:

^a *Taiwan nōka keizai chōsa*.

^b *Nōka keizai chōsa: shosaku nōka*.

^c *Nōka keizai chōsa: beisaku nōka*.



associated with different farm size class is fairly clear. Families that successfully acquired land through their cycle could only do so if family labor power had expanded to earn greater family income.

Large families with one or more generations living under the same roof eventually partitioned to form new nuclear households, each taking turn to provide for the elderly parents. All families naturally did not pass through the stem and joint family phases, nor did they always acquire more land. Many nuclear families remained in that phase until one or more members passed away or moved to another area. These families which reached the stem phase often partitioned to become nuclear households or else went into decline. The few, successful families that did achieve joint form usually did not remain in that phase for more than a decade or two before partitioning to form new nuclear households. The representative family cycle of nuclear, stem, and joint family associated with increasing farm size should be regarded as the ideal cycle which most families strived to achieve but only a small percentage ever realized.

The positive correlation between farm size and family size, number of workers per family, and income is neither accidental nor trivial. Only families with sufficient labor power earned more income than they spent so that some could be saved to buy land. Therefore, the larger the family, the higher usually its income. Minor deviations from this pattern can always be found and are explainable on grounds of sample size and individual household management. In general, however, a pattern seems to exist whereby both the net and gross income earned by the family farm becomes higher, the larger the farm and its wealth (Table 27). In some cases a neat linear trend of net income or income per capita to rise with farm size is not always observable because some small farms were operated by very efficient management and earned higher income than larger farms. Our main purpose, however, is to identify a central tendency while recognizing that deviations will occur but are explainable on other grounds.

Finally, a word on managerial ability amongst small family farms. Some families with less labor power often acquired more land and wealth than families with more labor power. The managerial component clearly was a critical factor in determining whether or not family farms ever became larger than their original size at the time of family partition. I have constructed Table 28 below to relate certain farming operational characteristics to the volume of farm sales. The marketed value per family farm is used as a proxy to show commer-

TABLE 28. MANAGERIAL CHARACTERISTICS ACCORDING TO VALUE OF GOODS MARKETED

Management characteristics	Farm sales (yen)			
	6,900-2,000 (11 farms)	2,000-1,100 (19 farms)	1,100-600 (20 farms)	600 and below (18 farms)
Capital	3,902.90 (2,848.21)	1,525.20 (795.68)	1,129.20 (696.49)	735.00 (275.66)
Profits per 100 yen of sales	69.49	83.50	96.06	91.84
Costs per 100 yen of sales	68.14	100.51	141.34	236.21
Hired labor per 100 yen of sales	9.03	19.00	20.75	15.77*
Land size (<i>chia</i>)	4.94 (3.39)	4.25 (1.63)	2.96 (1.11)	2.86 (1.31)

*Labor costs are low because most farms in this class were small and did not hire labor.

Source: *Taiwan nōka keizai chōsa*, pp. 20-39.

cial orientation of the farm and the success of the farm operator to keep costs low and maximize sales. The figures in parentheses represent the standard deviation from the mean and indicate the extent of variation that can occur for each variable being compared to marketed same class. This table presents a rough magnitude of managerial efficiency for family farming by showing types of cost and profitability according to farm marketed sales. Farms that successfully marketed more appear to possess more capital per unit of land and have lower labor and total unit costs. Although profits per 100 yen sales were lower on the large farms, these same farms marketed more than farms in other classes. Note, however, that farms in the highest sales class possessed the highest standard deviation for farm size. This high standard deviation suggests that farm size variability was quite great, and some very small farms still managed to operate efficiently and market a high percentage of output by maintaining low unit costs.

It seems likely that in every village some family farms were extremely well managed, others less so, and still others very poorly. There must have existed some family farms with household heads who were very innovative, hard working, and expertise in operating their farms. Below them, was another group less innovative but eager to follow the successful farms and imitate their operations. These same families undoubtedly worked hard, but they were unwilling to undertake risk and try new procedures. Below these two groups could be found still another group of family farms that preferred to wait some time before trying new methods. Perhaps some of these households did not contain outstanding managers, although family members were equally hard working and frugal. Finally, every village usually possessed a class of very poor families who mismanaged their resources and frequently their behavior deviated from the commonly accepted rules of hard work and frugality. Many of these families also lacked a male household head or only had an aged parent.

At this stage of our knowledge it is impossible to attribute any particular land tenure characteristic to a specific farming class, nor is it possible to rank or measure these classes according to the size of farm operated. While a tendency might have existed for the innovative, expert manager to have a large farm, there is no reason why such a family farm could not be a small nuclear household starting out on its family cycle. Because of dynamic demographic changes always underway in villages and the importance of household management, there does not exist any single, encompassing measure to classify family farms. Families constantly tried to improve their relative position and standing in the community but rarely at the expense of a neighbor, friend, or relative. The struggle for advancement continued as families sought to achieve certain defined social and spiritual goals. Families with poor resource endowment and possessed of inferior managerial expertise rarely achieved a high wealth and status position in the village.

By World War I the rapid increase in population and the new prosperity in the countryside had produced a great expansion in cultivated land. Nevertheless, the typical Taiwan family farm still ranged between one and three hectares in size with three to four out of 10 families farming as tenant households. The information contained in Table 29, acquired around 1916 for southern Taiwan, show the pervasiveness of small family farms and tenancy, a condition very prevalent throughout the island at this time. About six out of 10 family farms operated less than three hectares in Chia-i, whereas in Tainan the percentage was even higher. Less than two percent of household owned and operated farms larger than 10 hectares or 25 acres. Only one out of every three households owned and operated its farm with the remainder being part owner or pure tenant. These conditions arose from the historical pattern of land settlement undertaken by families and individuals without assistance from the public sector.

By the early 1920s Japanese agricultural experts recognized the preponderance of small farms, and their surveys had also shown that in spite of its small land area the typical Chinese

TABLE 29. FAMILY FARM SIZE AND TENURE CLASS IN TWO DISTRICTS OF SOUTHERN TAIWAN (1917)

	Chia-i		Tainan	
	Number of family farms	Percentage	Number of family farms	Percentage
1. Farm Size by Size Class (<i>chia</i>)				
Above 25	26	0.03	7	0.01
25 to 10	824	1.04	196	0.31
10 to 3	29,960	37.43	15,645	25.54
3 to 0.5	35,775	44.70	30,069	49.07
Below 0.5	13,465	16.80	15,361	25.07
2. Land Tenure Class				
Owner cultivator	36,006	30.00	21,918	32.00
Cultivator-tenant	25,328	30.00	24,299	36.00
Tenant	33,715	40.00	22,712	32.00

Source: Shikibe Yonesaku, "Nōka keizai no kansatsu" [A Survey of the Family Farm Economy], *Taiwan nōjihō* 133 (December 1917), pp. 1-2.

family farm managed to make ends meet.³⁸ For this reason, if farm income could be raised by increasing labor productivity and making available new farming inputs which would raise yield, rural living standards might gradually improve. The Japanese also noted the idle household labor during slack seasons, and they believed this labor could be used to breed livestock, produce handicraft articles and raise fish.³⁹ Japanese farm policy became predicated upon the principle of encouraging the peasantry to utilize their resources more intensively and efficiently by directing the public sector to create new opportunities for employment. This can be observed in the next section when long term patterns of land distribution, land terms and rural living conditions are examined.

Rural Life and Institutions

The average rural family appears to have contained more people than its counterpart provinces in southeastern China. Surveys of the early 1920s suggest that a typical family numbered eight

³⁸ This conclusion was reached by Shikibe Yonesaku in his comparative study of two family farms in Chia- and Tainan for 1916-17 in which he concluded that one farm lost 6.1 yen and the other earned a small surplus of 22.9 yen. Shikibe generalized that if the typical 1 or 2 hectare farm barely broke even in this fashion, the scope for improving the income and capital asset position of farms was indeed great because surplus labor could be utilized more effectively and productivity greatly increased by showing these families how to use new farming inputs. See his essay "Nōka keizai no kansatsu" [A Survey of the Family Farm Economy], *Taiwan nōjihō*, 133 (December 1917), pp. 6-11.

³⁹ Tanaka Hideo pointed out that in northern Taiwan during the winter months when farmers had considerable idle time on their hands, they should be encouraged to undertake mat making, weaving, pottery, bamboo work, etc. and that markets selling these goods should be developed. See Tanaka Hideo, "Hokubu Taiwan no tōki to nōka no fukugyō" [Subsidiary Enterprises of Family Farms and the Winter Season in Northern Taiwan], *Taiwan nōjihō*, 121 (December 1916), p. 4. The same suggestions were advanced in 1923 by Kagihara Michiyoshi who feared that a continued expansion of population and an ultimate shortage of farm land might take place in the near future. He urged that irrigation be promoted on inferior lands, that farmers be supplied chemical fertilizers, and that control of plant disease and pests be introduced. See Kagihara Michiyoshi, "Keishachi riyō to nōgyō keiei" [Farm Management and the Use of Sloping Land], *Taiwan nōjihō*, 197 (April 1923), pp. 5-10.

persons and that large households had as high as 20 and even 60 persons.⁴⁰ General prosperity and the high labor demands for cultivating rice and sugar cane encouraged families to become larger than in Japan and mainland China. The farmstead, depending upon family size, usually assumed an L shaped form around or adjacent to a courtyard for drying grain. When sons acquired wives, the parents built new sections to add to the main house in which they then lived separately. Chart V illustrates several examples of rice farms with their L shaped structure, the open courtyard, and nearby structures for storage and maintaining livestock.

The quality of housing in the early period was typically poor. As observed in Chart V most farm houses were roofed with straw or grass. Sagura Magozo reports in his journal that most homes leaked, but many appeared auspicious from the outside with their walls of brick and ceilings of tile.⁴¹

In Taiwan there are few trees planted, but construction materials abound. The local people use these materials to make their homes, and most houses are constructed of stone and tile. The natives also mold earth into bricks which are stored and then used to build the walls. They then set a frame upon these walls upon which they lay tiles to make a roof. The result is an imposing structure resembling Western houses. These homes contain no interior courtyard, and when one glances at the ceiling, he observes it readily leaks during a rain. How pitiable are these dwellings!

Even by 1922 tile roofs on farmsteads, except for the very wealthy, were extremely rare. A Western tourist traveling by train from Taichung to Taipei wrote that "all over the smiling plains were dotted farmhouses with walls of mud and roofs of thatch, circled by a towering wall—hedge is too mean a work—of thick bamboo."⁴² During the 1930s some farms began to improve their roofs, but a conspicuous and sharp qualitative change in rural housing probably did not take place during the period.

The Taiwanese ate pork as each rural family raised pigs: the smallest number being three or four and the largest number rarely exceeding eight or nine.⁴³ The peasants also raised great numbers of ducks: the largest flocks numbering as many as five or six hundred and the smallest totaling only 20 or 30 head.⁴⁴ According to a farm survey of household food consumption undertaken in the early 1920s, farms larger than 3.5 hectares consumed 20 percent more rice and roughly ten times as much tea than those of smaller size who consumed mainly sweet potatoes.⁴⁵ This pattern probably prevailed throughout the island, and the main staple of most rural families continued to be sweet potatoes with only a little rice and meat supplemented at festival times.

The first hand observations of the quality of housing and the few samples of rural family consumption patterns still tell very little about broad changes over time. Two recent studies of living standards do suggest that over the entire period a modest improvement definitely took place. From cross sectional rural household expenditure data from surveys undertaken in 1921, 1931, 1937 and 1941 Ramon H. Myers found that the Engel's coefficient for food expenditures gradually declined, indicating that a higher percentage of income was being spent for non-food

⁴⁰ Iwaki Kamehiko, "Hontō nōgyō keiei no tokushoku" [The Special Characteristics of Farm Management in Taiwan], *Taiwan nōjihō*, 176 (July 1921), p. 9. This observation was confirmed two decades earlier by the astute Japanese observer Sagura Magozo (*op. cit.*, p. 50). Sagura writes that the largest households numbered 60 and 70 persons and the smallest around 15 or 16 persons.

⁴¹ Sagura Magozo, *op. cit.*, p. 26.

⁴² Owen Rutter, *Through Formosa: An Account of Japan's Island Colony* (London, 1923), pp. 131–132.

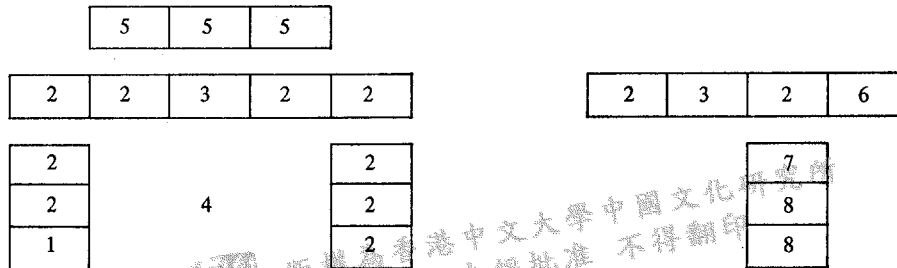
⁴³ Sagura Magozo, *op. cit.*, p. 36.

⁴⁴ *Ibid.*, p. 37.

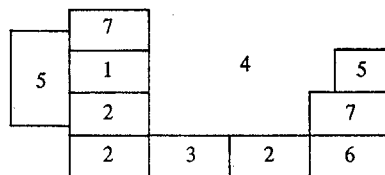
⁴⁵ Taiwan sōtokufu shokusanakyoku, *Taiwan nōka shokuryō shōhi chōsa* [A Survey of Food Consumption by Taiwan Family Farms] (Taipei, 1921), pp. 4–5.

CHART V. THREE EXAMPLES OF FARM LAYOUT (1921)

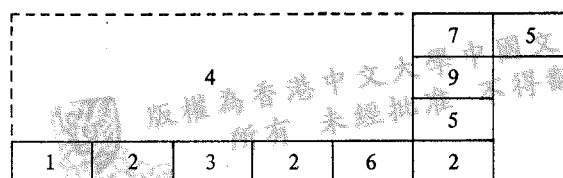
- A. Large farm of 25 persons, 4 buffalo, 5 pigs, 4 goats, and 2 storehouses. Household built of brick and roofed with straw.



- B. Medium farm of 14 persons, 1 buffalo, 2 pigs, and 2 storehouses. Household made of tile and brick and roofed with grass.



- C. Small farm of 8 persons, 2 buffalo, 2 pigs, and 2 storehouses. Household built of brick and roofed with straw.



- LEGEND: 1—Kitchen 6—Food storage room
 2—Bedroom 7—Workshop and storeroom for tools
 3—Living room 8—Livestock building
 4—Courtyard 9—Grainary
 5—Building for pigs

SOURCE: *Taiwan nōka keizai chōsa*, p. 80.

items.⁴⁶ Such a pattern typically occurs when real income rises. Toshiyuki Mizoguchi has constructed a retail price index for consumer goods by which to deflate money wage indices compiled for male and female farm workers. Between 1903 and 1938 he found that the annual growth rate of real rural wages rose 2.8 and 1.2 percent respectively for male and female farm

⁴⁶ Ramon H. Myers, "Agrarian Policy and Agricultural Transformation: Mainland China and Taiwan, 1895-1945," pp. 530-531.

workers.⁴⁷ Such a finding naturally obscures the important fact that real income did not rise steadily but fluctuated sharply; rising until 1910, falling, and then rising again during the period of World War I; in 1920 real wages fell sharply until around 1925, flattened out, and then rose in the late 1920s; they again fell in 1930, rose slightly in 1932 but then declined steadily during the entire 1930s, chiefly because retail prices began to rise rapidly and money wages lagged further behind. In spite of these price fluctuations, the level of real wages for male farm workers in the late 1930s stood nearly twice that of the 1903-05 level.⁴⁸

Land distribution did not become progressively unequal over time, but land holding inequality was already very great at the outset of the period. The first island land survey to measure distribution, undertaken in 1921, revealed that 64 percent of rural households only owned 14 percent of the land whereas 11 percent of farms owned as much as 62 percent of the land.⁴⁹ The rural population increase that began to accelerate after 1900 might have made land distribution more unequal had not agriculture rapidly developed and more new employment opportunities outside of farming become available. Farm output expansion and the gradual, steady rise in real farm income enabled many families to save and buy some land, thereby enabling them to gain a slender foothold in the rural community and become either owner-cultivator or part-owner farmers. The following table shows rural population growth and the changing land tenure structure between 1910 and 1937.

TABLE 30. LAND TENURE STRUCTURE AND RURAL POPULATION CHANGE: 1910-1937

Year	Total	Land tenure structure (percent)			Index of rural population change
		Owner	Owner-tenant	Tenant	
1910	100	34	24	42	100
1915	100	31	26	43	108
1920	100	32	29	39	107
1925	100	30	31	39	112
1930	100	29	32	39	121
1937	100	31	33	36	138

Source: *Jih-chü shih-tai T'ai-wan ching-chi shih*, 1, calculated from pp. 13-20.

The percentage share of tenant families declined from 42 to 36; tenant families increased 19 percent compared to a 38 percent rise in farm population. Tenant families either departed from agriculture or achieved part-owner status so that with every five people being added to agriculture, only one became a tenant instead of two or more as in former times. The percentage share of owner farms fell from 34 to 31 because many sold their land, some divided their land equally among the male heirs which often resulted in these same household renting some land, while others through bad fortune or poor management lost their land. The share of owner-tenant farms rose from 24 to 33 percent, which is the biggest percentage change among the three groups.

During periods of sharp commodity price rise, landlords tried to increase tenant rents. This effort did not always prove successful for during these same periods the demand for wage labor throughout the economy also rose. Where tenants preferred to work out of the village,

⁴⁷ Toshiyuki Mizoguchi, *Consumer Prices and Real Wages in Taiwan and Korea under the Reign of Japan*, Technical Paper no. 5 (May 1971), Institute of Economic Research in Hitotsubashi University, p. 10.

⁴⁸ *Ibid.*, see Figure A.2.

⁴⁹ Taiwan sōtokufu shokusan-kyoku, *Tochi bumpai oyobi keiei chōsa* [A Survey of Distribution and Management of Farm Land] (Taipei, 1921), pp. 2-3.

landlords found it more difficult to find other tenants willing to rent and pay the higher rents they desired. As a result rents tended to lag behind farm prices, and many tenants were able to reap small windfall gains from rising crop prices as well as earn additional non-farm income. Many landowners also sold some of their land to invest in commercial or small industrial activities. Periodic booms in land sales probably prevented land prices from rising more rapidly than would otherwise have been the case so that some tenants could find plots of land they could afford to buy.

In Hsin-chuang district of I-lan prefecture tenants began to improve their land in the late teens in response to rising crop prices.⁵⁰ In Taichung prefecture crop rents between 1900 and 1920 only rose 30 or 35 percent,⁵¹ whereas the price of rice, the principal product of this area, more than doubled.⁵² Lagging crop rents again enabled more tenants to buy some land of their own. Employment opportunity in Taichung city and on nearby sugar cane farms also expanded, and more tenant families supplemented their farm earnings with off-farm wage income. These same families saved and purchased land so that the number of tenant farms around Taichung city actually declined during the early 1920s.⁵³ In Ta-chia district of the same prefecture the growth of trade and income generated more wage income to tenants, enabling many to buy land; similar conditions prevailed in Chang-hua and Nan-t'ou districts.⁵⁴ In Kaohsiung prefecture the growth of sugar cane cultivation also increased the demand for farm labor.⁵⁵ Many tenant farm workers also went to the Pescadore islands on a seasonal basis to find work. As more labor drifted away from farming, attracted by new opportunities in and near the cities, more tenant families became part-owners.

The downturn in farm prices after 1922 caused considerable agrarian distress, particularly for families which might have been in debt or who had made plans for land acquisition and found they could not earn the incomes they expected. Furthermore, rents did not fall with the same speed as farm prices. Landlords pressed their tenants to pay the same rents in kind which had been reached during the period of rising prices. Tenants resisted and insisted upon longer term leases, made in writing, and a reduction of rent deposits.⁵⁶ These demands forced landlords to resist in turn, and as a result during the mid 1920s a rash of tenant-landlord disputes broke out, threatening to undermine Japanese authority and disturb several decades of peace which the authorities had worked so assiduously to establish.

Contracts agreed upon by tenant and landlord were concluded by word of mouth and usually lasted no longer than a year or two at most.⁵⁷ Tenants also paid landlords a rent deposit

⁵⁰ Taiwan sōtokufu shokusanakyoku, *Kakushū kosaku kankō chōsa* [A Survey of Tenant Customs in Taiwan's Prefectures] (Taipei, 1926), p. 73.

⁵¹ *Ibid.*, p. 175.

⁵² Between 1905 and 1918 the retail price for one *to* (one-tenth of a *koku* capacity) of rice in Taichung had risen from 0.814 to 2.430 yen. The day wages for workers between 1905 and 1915 rose nearly 70 percent or twice the rise in rents as expressed in rice payments. See Taiwan sōtokufu shokusanakyoku, *Taiwan no nōgyō rōdō ni kansuru chōsa* [A Survey of Farm Labor in Taiwan] (Taipei, 1919), pp. 156–157 for rice price information and pp. 151–152 for day wage data.

⁵³ *Kakushū kosaku kankō chōsa*, p. 246.

⁵⁴ *Ibid.*, pp. 247–248.

⁵⁵ *Ibid.*, p. 319.

⁵⁶ *Ibid.*, for Taipei prefecture see p. 69; for Hsinchu, pp. 128–129; for Taichung, p. 241; for Tainan prefecture, p. 311.

⁵⁷ There are many excellent Japanese studies and reports of the Taiwan land tenure system, too numerous to list here. See in particular Rin Chō Kyō and Shigeno Shinichi, *Taiwan no kosaku mondai* [The Tenant Problem in Taiwan], p. 78 for description of oral, short term contracts; p. 82 on rent deposits; pp. 79–80 on non-standardized rent payments in kind. Also Hsinchu District, *Shinchikushū no nōgyō* [Agriculture in Hsinchu Prefecture], pp. 78–80.

from which the tenant neither received interest nor did the landlord ever use it as a loan to assist his tenant to improve the land. Crop rents, generally paid in kind, ranged between 30 to 60 percent of the major crop grown upon the leased land. Landlords gave their tenants maximum freedom to manage their land, preferring to obtain as much rent as possible with minimal risk. An intermediary, usually a friend or relative, introduced the tenant and landlord, so that a personal bond united the parties and elicited from them a strong obligation to honor their commitments. Sagura Magozo expressed considerable astonishment that disputes and litigation, particularly between creditor and debtor where formal contracts also were unknown, were so rare, and he attributed such harmony to the fact that "each party knew the other and trusted him."⁵⁸ Before 1920 landlord-tenant disputes were very rare.

But gradually more farmers began to realize that by properly managing their farms to produce for the market they could earn higher profit. The new rural prosperity and the rapid growth of village numbers probably made land tenure agreements even more impersonal and arbitrary than in former times. Tenants that recognized the profitability of making land improvement and planned to do so as farm prices rose were naturally eager to have long term contracts in writing. But when farm prices fell in 1922-23 and landlords resisted their pleas to reduce rents accordingly, numerous disputes erupted. As a result, in spite of third party involvements, misunderstandings often arose, tenure contracts were easily broken, and tenant and landlord each went their own way.

Meanwhile Japanese officials had learned from their rural surveys just how unequally land was distributed and how precarious the livelihood earned by farm families with less than one or two hectares. A rash of landlord-tenant disputes in 1922 prompted some officials to select a village in Hsin-yung district of Tainan prefecture to establish a landlord-tenant association for settling disputes and improving relationships between tenants and landlords by making written contracts on a long term basis. As tenant-landlord disputes increased in frequency by 1924, officials decided to extend this experimental association to other villages. In 1927 the administration appropriated funds to prefectural chiefs, instructing them to organize tenant-landlord associations throughout their respective prefectures. By 1935 the administration had spent 300,000 yen, a significant sum, to establish 166 of these associations. Rural households farming 70 percent of tenant land had written contracts with their landlords,⁵⁹ and these associations had resolved more than 5,000 disputes. In this gradual manner the administration compelled

⁵⁸ Sagura Magozo, *op. cit.*, p. 50.

⁵⁹ See Taiwan sōtokufu shokusanakyoku, *Hontō kosaku kairyō jigyō seiki gaiyō* [A Summary of the Achievements to Reform the Land Tenure System in Taiwan] (Taipei, 1936), p. 12. By 1940 these associations had promoted greater use of formal, long term contracts and tenant rent books throughout Taiwan. The following figures for 1940 show this progress.

District	Percent of tenant land where contracts and rent books were used
Taipei	69.63
Hsinchu	80.60
Taichung	65.88
Tainan	86.74
Kaohsiung	78.22
Average	76.21

In 12 years the administration had made mandatory the use of rent books and long term, formal tenant-landlord contracts for about three-fourths of all tenant land. See Taiwan sōtokufu shokusanakyoku, *Hontō kosaku kairyō jigyō seiki gaiyō*, p. 13.

landlords and tenants to adopt formal, legal contracts which encouraged both parties to improve the productivity of land as it seemed in their interest to do.

The significant rural development that occurred under Japanese rule can be summarized as follows. First, colonial officials committed themselves to promoting agricultural improvement to make Taiwan an extension of the Japanese rural sector. They established a similar infrastructure and organizational complex as had been done in Meiji Japan to make available a modern technology to farmers and encourage them to produce more for the market. By any measurement standards and comparisons with other agrosystems for this century their policy seems to have been enormously successful. The output of the major crops such as rice and sugar cane greatly increased, and the overall output growth of food grains, industrial crops and miscellaneous products increased at a higher annual growth rate than that of population. Japan became the ultimate buyer of Taiwan rural products and in return supplied her with manufactured goods.

Second, family farms gradually improved their efficiency of operation by adopting new seeds, purchasing new fertilizers and using more irrigated land. More and more farmers increased their farming skills and managerial competence to use these new, modern inputs. Small and large family farms ranging between one and five hectares as well as tenants and owner cultivators also gradually increased their specialization and production for the market. Without doubt the farming skills which the peasantry improved upon during Ch'ing times made them very receptive toward the new farm policy initiated by the Japanese. A Japanese observer at the turn of the century recognized the inherent potential for growth in this farming system even before the colonial farm policy began to take form.⁸⁰

The scale of farming in Taiwan is larger and more extensive than in our country. For example, there are large fields separated by paths which do not resemble at all the small plots scattered so disorderly throughout our countryside. Furthermore, the farmers use water buffalo on their paddy land; they save labor this way and harvest a much larger crop. Farmers that grow rice, specialize in rice production; sugar cane growing farmers specialize in sugar cane production; vegetable growing farmers produce only vegetables. This is a farming system based upon planned and determined specialization. Moreover, the farmers pay a great deal of attention to irrigation. To make their paddy land, they dig wells and use well sweeps to raise the water to the surface. They have built canals to the fields that want to irrigate, and they then use animal power to force the water to the paddy area. From planting to harvest these farmers are active in their work. They are able to increase production because of a good climate which gives them two good harvests each year. How prosperous these people are!

There was no reason why such able farmers would not willingly respond to new market opportunities to increase production and earn more income. Because of the small size of farms and the rapid growth of the farming population, the bulk of which inevitably found employment in agriculture, farmers reluctantly purchased expensive machinery to replace labor. Consequently, the new capital accumulation that took place on farms consisted mainly of new seeds, improved fertilizers and a larger supply of available water. The additional income farmers earned by increasing crop yields went for modest improvement of farm structure, to buy land, and purchase the new consumer goods becoming available.

Like colonial administrations throughout the world at this time the Japanese did not take a deep interest in their subjects until late in their administration. For this reason we have little detailed information how life in the countryside changed over the period except some casual observations made by travellers or officials and village studies conducted in the late 1930s and early 1940s. These studies provide only a few insights into rural life of this

⁸⁰ Sagura Magozo, *op. cit.*, p. 47.

period. Chinese researchers who visited Hu-k'ou village in the early 1940s reported that this large Hakka village of over 3,000 hectares of paddy and garden land had been first settled some 150 years before.⁶¹ They described its large temple, numerous shops, and location near the Taipei-Hsinchu railroad not far from the western sea coast. Family farms were irrigated by small reservoirs capable of supplying water for 3 hectares of land. A family with one male adult needed two hectares of land to support itself or else obtain income off the farm. Most families owned some labor animals and a few livestock and tilled small gardens near the homestead. A family used a variety of hand tools such as forks, rakes, hoes, baskets, sickles and crude ploughs. Families frequently cooperated to share labor and capital to plant, weed and harvest each other's crops. These observations, however, really do not tell us a great deal about rural change over time, and these general characteristics probably could be found in other villages. Another Japanese field study focused upon a village near Hsinchu city specializing in vegetable production.⁶² It contained 330 households of which 260 possessed three or four garden plots producing for the market. The Hakka women weeded the fields while the men worked at an assortment of odd jobs. The village temple served as an important focal point for community affairs and permitted villagers to worship their agricultural gods. The standard of living appeared to be somewhat higher than other villages because the farmers earned a more stable income. Wartime conditions in the early 1940s had still not adversely affected village life.

The rhythm and style of rural life probably changed very little for most villages over this period; farm tools remained much the same as those of the late 19th century; the mode of housing varied according to family wealth; villages specialized to produce a few marketed crops; religion played a great role in people's lives, serving as a means for ancestor worship and to elicit nature's grace to ensure a bountiful harvest; local irrigation efforts by families still was the major method for acquiring sufficient water; villages of large size still possessed no schools. On the other hand villages did become larger in size; wealthy families with considerable land could trace their origins back to the 19th century and perhaps earlier, and some households appear to have established closer contact with the urban economy and society. Unlike the countryside in Indonesia under the Dutch, India under the British, and Vietnam under the French, the Chinese farmer of Taiwan received assistance from the state to improve his farming practices, so that by the early 1920s agriculture had entered a new phase of development. In the words of one Chinese visitor, "Taiwan's agriculture has developed industry and forestry and has given the people their livelihood. Everyone has enough to eat. Furthermore, even at night no one locks their doors."⁶³ Under harsh Japanese police rule, agriculture had prospered, and the peasantry enjoyed peace and security.

⁶¹ Chang Shang-ch'ing, Huang Hsu-ch'u and Kuo Fen-chih, "Mura no rekishi to seikatsu" [The Life and History of a Village], *Minzoku Taiwan* [Popular Customs of Taiwan], 5:35 (May 1944), pp. 2-17.

⁶² Tokuyama Genichirō, "Sosai buraku shinsha o otozurete" [A Visit to a Vegetable Producing Village], *Minzoku Taiwan*, 40 (October 1944), pp. 22-24.

⁶³ Quoted by Liu Fan-cheng in his report of a tour to Taiwan in *T'ai-wan lü-hsing chi*, p. 79.

日治時期之台灣農村經濟

(中文摘要)

馬若孟

一八九五至一九三八年間，日本殖民地政府對台灣農業經濟着手進行「綠色革命」。新品種、化學肥料和灌溉改良所形成生物學上的變革，使農村生產劇增。在最初二十年，耕地約增百分之六十五；一九二〇年以後擴展較緩，惟收穫比前迅速增多。最先增產為甘蔗，跟着是米糧，最後廣及其他穀類、蔬菜、生果和纖維作物。

自一八九八至一九一〇年，殖民政府為擴充市場和減低運輸與交易費用，曾作大量基層投資。日人同時設立現代化農業研究機構，與農民團體相結合，將實驗室和農事試驗場所發展之進步方法，及現代化農作投入，介紹給農民；並利用其地方官吏、警察和保甲之類農村組織，對農民之採用新品種與現代農作投入，加以監視和輔導。至一九三〇年代，便產出一連串新資料，並將新投入供給全島農民。

除了一次土地測量和地稅改革，將土地所有權授予舊小租階級以外，行政當局一直至三十年代並未變更或刷新農村基本設施。一九三〇年，當局發起設立地主佃農協會，負責使租約長期化並用書面訂定，解決爭端。當時農村人口劇增，家庭農場也跟着增加。農民家庭繼續擴大，有些由核心形式發展而為支系以至大家族。後者通常獲得土地，成為殷戶和農村地主。

家庭農場雖小(大都不過一二公頃)，農村收益也常變動，但實際收益仍逐步上昇。日治時期農村人口約增百分之四十，土地分配和業權制度卻未改變。這是因為佃農逐漸成為半地主，而地主則變賣或劃分其田地，使土地所有權和利用得繼續重新分配。日治時期結束時，台灣農民已成為熟練農人，在和平、產業有保障和經濟安定情況下，對其耕地之計劃與管理，頗能應付自如。