

## SELECTED ISSUES IN THE IMPACT OF INDUSTRIALIZATION ON AGRICULTURE IN KOREA

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### I. INTRODUCTION

Until the early 1960s Korea remained a typical preindustrial country with almost half of its GNP generated by agriculture and the overwhelming portion of its population engaged in farming. But the vigorous industrialization and export drive undertaken in the early 1960s have rapidly transformed the agrarian character of the economy. Between 1955 and 1977, the share of agriculture in GNP declined from about 46 percent to less than 20 percent and the proportion of rural population declined from 62 percent to 34 percent. Expansion in the nonagricultural sector has proceeded far more rapidly than in the agricultural sector. While the total GNP expanded at an average annual rate of about 10 percent, the agricultural sector grew at an average of about 3 percent. Throughout the process of this rapid industrialization, the interaction between agriculture and other economic sectors has had significant implications for overall economic growth.

In explaining sectoral interaction, much of the literature on economic development views agricultural development as a precondition for industrialization in the early stages of development. For example, Professor Simon Kuznets (1961) argues that a rise in productivity per worker in agriculture is a precondition of the industrial revolution in any part of the world. In this regard, Professor Paul Bairoch (1964) also emphasizes that an increase in agricultural productivity and growth in demand for agricultural inputs supplied by industry are major forces that give impetus to the process of cumulative economic growth. Since agriculture is by far the largest sector in a traditional economy, it is often assumed that rural sector not only constituted a source of capital and labor for industry but also provides the major source of demand for industrial output as well as supplies of industrial raw materials. Rising rural labor productivity also contributes, through expanding farm output, to maintaining food prices at a low level and hence sustaining low levels of industrial wages that would otherwise cut into investment in the nonfarm sectors. Therefore, it is often argued that economic development must

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begin with an all-out endeavor to develop agricultural sources in order to promote industrialization.

However, this hardly seems to be the case with Korea in view of the actual performance of Korean agriculture during the past thirty years. Although agriculture's contribution to Korean economic growth has been significant, particularly in such respects as providing surplus labor to the rapidly growing sectors, the farm population has benefited greatly from industrial growth. Rapid urbanization and industrialization have drawn large numbers of people out of rural areas by providing employment opportunities in the nonagricultural sectors.

No attempt will be made in this short paper to clarify all the areas of complementarity and competitiveness between agricultural and industrial development. Instead, the paper intends to identify only a few limited aspects of the role agriculture played, and the benefits the rural sector received, in the process of industrialization in Korea.

## II. AGRICULTURE'S CONTRIBUTION TO THE OVERALL GROWTH

Of the total increase in GNP of 4,300 billion won (in 1970 constant prices) between 1955 and 1977, the agricultural sector contributed 565 billion won, or 13 percent. The mining and manufacturing sectors which accounted for only 12 percent of GNP in 1955 registered on almost 23-fold increase during the same period. The 1,800 billion won increase in GNP in these sectors accounted for 42 percent of the total increase in GNP. The remaining 45 percent increase came from other sectors including public works, transportation and service industries.

Agriculture's relatively small and declining contribution to GNP growth, however, was not the result of an unusually slow growth in Korea. In fact, Korea's agricultural performance over the past two decades exceeded the world average and was comparable to the Asian average. In terms of land productivity, Korea probably is one of the highest-ranking countries. Rice yields, for example, were more than double those of most Southeast Asian countries. In 1977 Korean rice farmers achieved an even higher level of yield than their heavily subsidized Japanese counterparts. One of the main reasons for this high land productivity, of course, was that Korea had a sufficient supply of farm workers relative to scarce land resources. In terms of acreage of cultivable land per person, Korea's land endowment is probably the smallest in the world.

It is also important to note that the declining contribution of Korean agriculture to overall economic growth is not due to the farmers' failure to respond to various stimuli, but basically a result of unfavorable factor endowments. Given the poor land resources and the limited substitutability of capital and labor, it was inevitable that the growth of agriculture lagged behind other sectors.

TABLE I  
RELATIVE SHARE OF AGRICULTURE IN GNP AND POPULATION

Year	(at 1970 constant prices)	
	Share in GNP (%)	Share in Population (%)
1955	45.5	61.9
60	39.9	58.3
65	37.6	55.8
70	26.2	45.9
75	19.2	38.2
77	19.1	33.8

Source: The Bank of Korea, *Economic Statistics Yearbook*, 1955-77.

TABLE 2  
SECTORAL CONTRIBUTION TO GNP GROWTH

At 1970 constant prices, unit: billion won

Year	Total GNP	Agriculture Forestry & Fisheries	Mining & Manufacturing	Other Sectors
1955	938.2	438.6	82.0	417.7
1977	5,259.5	1,002.8	1,907.2	2,350.0
Increase (1977-55)	4,321.3	564.2	1,825.2	1,932.3
Contribution	(100%)	(13.1%)	(42.2%)	(44.7%)

\* Includes public works, transport, and service sectors.

Source: Computed from the data in the *National Statistics Yearbook* 1955-77 (The Bank of Korea).

TABLE 3  
INTERNATIONAL COMPARISON OF AGRICULTURAL GROWTH RATE

Country & Region	1952/61(%)	1961/71(%)	1952/71(%)	1970/1977(%)
Korea	3.1	3.7	3.5	2.8
World	2.8	2.6	2.7	2.3
North America	1.1	2.1	1.6	1.7
South America	3.5	2.4	2.9	2.7
Africa	2.8	2.9	2.9	2.6
Southeast Asia	4.2	2.6	3.4	2.2
Japan	2.4	2.0	2.2	1.5
India	3.6	2.2	2.9	2.6
Thailand	5.2	3.6	4.4	4.0
Taiwan	4.1	3.9	4.0	—

Source: FAO, *FAO Production Yearbook*, 1977

TABLE 4  
INTERNATIONAL COMPARISON OF RICE YIELD  
(paddy rice)

Country	Year	Yield per Hectare (kg)
Korea	1952-56	3,340
	1961-65	4,110
	1975	5,324
	1977	6,780
Japan	1952-56	4,340
	1961-65	5,020
	1975	6,187
	1977	6,166
Taiwan	1952-56	2,810
	1961-65	3,670
	1970	4,160
India	1952-56	1,280
	1961-65	1,480
	1975	1,858
	1977	1,873
Thailand	1952-56	1,350
	1961-65	1,760
	1975	1,825
	1977	1,813

Source: FAO, *FAO Production Yearbook*, 1969-1977.

TABLE 5  
INTERNATIONAL COMPARISON OF PER CAPITA ARABLE LAND 1976

Country	Total Arable Land (1000ha)	Total Population (million)	Rural Population (million)	Per Capita Arable Land (ha)	Rural Per Capita Land (ha)
Korea	2,060	35.3	15.4	.058	.134
Japan	4,415	112.8	15.5	.039	.285
India	164,800	628.8	414.7	.262	.397
Thailand	15,750	43.5	33.6	.362	.469
U. S. A.	186,500	215.1	5.6	.867	33.304

Source: FAO, *FAO Production Yearbook*, 1977.

### III. LABOR TRANSFER

Labor transfer out of agriculture is one of the most conspicuous phenomenon that takes place in the early stages of industrialization in most less-developed countries. Korea is no exception. Although the determination of the size of such a transfer depends largely on its definition and the method of estimation, one study indicates that in Korea approximately 400 thousand rural people have moved to urban areas every year, or about 10 million during the 1955-77 period (Moon 1975).

In earlier years, when there existed a massive surplus of labor relative to land holdings, migration out of rural areas provided cheap labor for the growing industrial and urban sectors without reducing the aggregate farm output. One may argue that this migration of farm labor into the nonagricultural sectors, together with the investment made by the rural areas in education, was the chief contribution of the farm sector to Korea's industrialization. But the causality is not always a one-way phenomenon. If the population that shifted into the nonagricultural sectors had remained on the farms, rural areas of Korea would have been much more crowded and the average farm size would have been reduced to 0.6–0.7 hectares by the mid-1970s. The result would have certainly aggravated the difficulty inherent to the marginality of Korean agriculture, for nearly all the problems in the rural sector have their origin in the marginal scale of farming.

Beginning in the early 1970s, however, a labor shortage began to be felt in both the rural and urban labor markets. Since outmigrants consisted mostly of the more educated and productive young persons, a rising proportion of the aged and women were left on the farms. The proportion of workers aged 14 to 24 in the total rural labor force diminished from 27 percent in 1963 to 21 percent in 1976. The absolute number of persons in that age group decreased nearly 11 percent during the same period. When the natural growth of the rural population is taken into account, the actual number of outmigrants in this age bracket would far exceed the rate of decline in absolute numbers. The number of adult workers aged 25 to 49 has increased slightly during the past 13 years but their relative share has declined from 54 percent to 52 percent. In contrast, the number of workers 50 or more years of age has increased 67 percent and their relative share also rose from 19 percent to 27 percent. A survey of the distribution of the rural labor force by sex shows that while the number of male workers increased only 4 percent, that of female workers increased as much as 31 percent during the same period. Thus the proportion of female workers went up from 38 percent to 44 percent.

One eventual consequence of the decline in the relatively younger and productive portion of rural workers would be a general rise in the level of rural wages which in turn may cause an upward pressure on the cost of farm products. In effect, by the mid-1970s Korea had ceased to be a "labor surplus" economy where wages were determined largely by "tradition" or "absolute needs for subsistence." Real wages for both industrial and farm workers began to rise markedly in recent years.

The shrinking rural work force and rising rural wages combined to produce a major stimulus towards modernization of farming techniques. Farm mechanization proceeded at a rapid pace. Although peak season activities were not fully mechanized, the number of power tillers, power threshers and other labor-saving machinery in use has rapidly increased.

Highyielding new varieties of rice (Tongil and Yushin) have been widely diffused owing to the expansion of irrigation facilities and easy access to irrigation pumps. The availability of government subsidies and credit has undoubtedly accelerated this modernization of farming techniques, and yet the growing outmigration was the major driving force. The consequence was a remarkable increase in both land and labor productivity.

TABLE 6

NUMBER OF ACTIVE WORKERS IN THE AGRICULTURAL FORESTRY AND FISHERIES SECTORS  
AND DISTRIBUTION BY AGE

Year	Total		14 to 24		25 to 49		Over 50	
	Number (1000)	Ratio (%)	Number (1000)	Ratio (%)	Number (1000)	Ratio (%)	Number (1000)	Ratio (%)
1963	4,837	100.0	1,320	27.3	2,609	53.9	908	18.8
1965	4,810	100.0	1,270	26.4	2,640	54.9	900	18.7
1970	4,916	100.0	1,149	23.4	2,772	56.4	995	20.2
1976	5,601	100.0	1,181	21.1	2,900	51.8	1,520	27.1

Source: Statistics Bureau, The Economic Planning Board.

TABLE 7

NUMBER OF MALE AND FEMALE WORKERS IN THE AGRICULTURAL, FORESTRY AND  
FISHERIES SECTORS

Year	Total		Male		Female	
	Number (1000)	Ratio (%)	Number (1000)	Ratio (%)	Number (1000)	Ratio (%)
1963	4,837	100.0	2,869	59.3	1,968	40.7
1965	4,810	100.0	2,821	58.6	1,989	41.4
1970	4,916	100.0	2,791	56.8	2,125	43.2
1976	5,601	100.0	2,991	53.4	2,610	46.6

Source: Statistics Bureau, The Economic Planning Board.

TABLE 8

AVERAGE ANNUAL GROWTH RATE OF LAND AND LABOR PRODUCTIVITY IN AGRICULTURAL  
SECTOR

Period	Labor Productivity (%)	Land Productivity (%)
1954-65	0.70	2.64
1965-73	5.65	2.23

Source: S.H. Ban, 1974, *The Growth of Korean Agriculture*, KDI Press.

#### IV. LOW FOOD PRICES AND THEIR IMPLICATIONS

Changes in terms of trade between agriculture and industry are closely

interwoven with various aspects of the economy. Low food prices for urban workers may initially be rationalized in terms of equitable income distribution, but they serve primarily to increase industrial profits and capital formation at the expense of farm producers. When the supply of labor was highly elastic in Korea, low food prices helped reduce the cost of living in urban areas and made it possible to maintain industrial wages at a lower level than would otherwise have been possible.

During the 1950s, the government's primary efforts were directed toward the rehabilitation of the war-ravaged economy and toward the alleviation of inflation. Policymakers, sensitive to the effects of foodgrain prices on urban consumers' costs of living and the general price level, placed major emphasis on maintaining grain prices as low as possible.<sup>1</sup> The U.S. grain made available under the U.S. Public Law 480 program since 1955 provided one of major props which enabled the Korean government to pursue a low price policy for staple foodgrain.

Although PL 480 grain has contributed significantly to general economic stability, the availability of aid grain has undoubtedly been a disincentive to policymakers in their attempts to increase domestic production by means of a high price policy. The government purchase price for rice remained lower than the estimated costs of production in almost every year until 1960. The government grain was in effect requisitioned compulsorily from farmers through administrative channels. *Table 9* gives the estimated loss on the part of farmers due to the rice price policy during the 1952-60 period. If one views the cost of production as the minimum price that producers should obtain, the gap between the cost of production and actual prices received implies the income transfer out of agriculture in order to support low wage levels in the industrial sector.

Beginning in the late 1960s the government grain price policy underwent a marked change. Not only did the government raise rice and barely purchase prices substantially for several years, but it did so without effecting a comparable rise in the price at which rice and barley were sold to urban consumers. This led to a substantial deficit in the grain account. The range and nature of the impact of the government financial deficit thus incurred depends upon how the deficit is financed. If the deficits were financed out of the general budget account, it would simply mean a reduction in budget expenditures for other sectors. So far as the

<sup>1</sup>The government had two other motivations for establishing low grain prices. First, it wanted to provide grain at less than open market prices to wounded veterans and their families, to workers in critical industries, and to those who were assumed to be less able to buy food at market prices than "normal" consumers. Second, the government desired to minimize the amount of current annual payments that it had to make to landlords who were forced to sell land under the land reform program implemented in 1950. These landlords were given government bonds, the face values of which were stated in terms of rice.

grain operation was concerned, this was not the case. A large portion of the deficit has been financed through the long-term overdrafts from the central bank, which caused substantial increases in the money supply.

Throughout the 1950s and much of the 1960s the government withheld any major move to stimulate agricultural production in order to curb inflation. However, in the 1970s the government came to use grain prices as a means of improving agriculture's terms of trade in order to raise farm incomes and encourage increased production in spite of the significant increase in inflationary pressure. In order to alleviate the impact on the urban population of the increased cost of food, the government managed to disperse inflation into other, presumably less regressive, directions.

TABLE 9  
FARMERS' FINANCIAL LOSSES RESULTING FROM SALES TO GOVERNMENT

(current prices)

Crop Year	Quantity of Sales 100M/T	Government Price won/80kg	Cost of Production won/80kg	Loss won/80kg	Total Loss Million won
1952	268	200.62	329.09	128.47	430
53	517	200.62	330.94	130.32	842
54	347	308.33	330.94	22.61	98
55	389	390.56	838.14	447.58	2,176
56	286	1,059.00	1,134.00	75.00	268
57	175	1,059.00	1,394.00	335.00	733
58	168	1,059.00	1,297.00	238.00	500
59	198	1,059.00	1,300.00	241.00	594
60	141	1,059.00	1,313.00	254.00	448

Sources: Computed from *Agricultural Statistics Yearbook*, 1955-60, and *Cost of Production Survey*, 1955-60 (The Ministry of Agriculture and Forestry).

## V. LOW RATE OF RURAL SAVINGS

It is a widely accepted notion that savings in the rural sector, whether created from farm surplus or derived through compulsory measures such as in form of land taxes, play an essential role in capital formation in the early stages of industrialization.

In Japan, for example, heavy taxation on farmland served as one of the most important transfer mechanisms through which the agricultural sector provided investment resources for the nonagricultural sectors (Hayami 1975, p. 365). In Taiwan, increases in agricultural productivity and the resultant farm surplus were important sources of investment financing that accelerated the process of industrialization (Hsieh 1966, pp.2-3)



In Korea, however, there is little evidence that the agricultural sector provided sizable financial resources for investment in the nonagricultural sectors, except for possible income transfers due to the unfavorable terms of trade for agriculture in the 1950s and 1960s.

To begin with, there was not much farm surplus in the form of rural savings. Second, the political situation in Korea after World War II was such that it did not permit heavy taxation of the rural sector. *Table 10* shows farm household savings and direct taxes paid by farmers. In the 1950s, farmers, in general, had a negative cash flow. In the 1960s farmers were able to save a respectable proportion of their income, but relatively little of their savings went into the modern sector. In order for savings to be readily available for investment outside of the agricultural sector, they would have to be kept in the form of cash that could be deposited in banks or Kae societies (traditional form of credit unions), or lent to firms directly. But in the 1950s and 1960s, farmers generally appeared to have had little or no surplus cash available for such investment.

Beginning in the 1970s the picture changed significantly. For the first time since the 1930s the Korean farmers made substantial cash savings.<sup>2</sup> Despite the increase in savings rates in the 1970s, rural savings played only a small part in gross domestic capital formation. Throughout most of the years after 1960, rural savings financed only about ten to fifteen percent of total capital formation, a share about equal to the percentage contribution of agriculture to GNP growth. Most farm savings remained on the farms to be invested in the purchase of farm equipment, housing improvements and the like.

The contribution of direct taxes and public charges to gross domestic capital formation was obviously less than that of savings even if it is assumed that the entire amount of rural direct taxes and public charges were channeled into a net increase in capital formation rather than government expenditures. The addition of indirect taxes would not appear to change this picture much. The largest indirect taxes are those collected from alcoholic beverages and petroleum products (nearly 70 per cent of the total indirect taxes levied in the 1970s). It is unlikely that farmers paid a significant part of the petroleum tax, and it is probable that the rural share of taxes in the other category is substantially lower than the rural share of population because of lower rural incomes and the high percentage of self-supplied consumption goods. The total amount of indirect taxes paid by the rural population may still be much larger than the amount of direct taxes, which consisted mainly of farmland tax. The sum of both direct and indirect taxes on agriculture amounted to less than

<sup>2</sup>The positive net cash flow in the 1930's is due to the strong cash position of landlords and other high income groups.

total government expenditures on agricultural investment, at least in the 1970s. If account is taken of the government subsidies for agricultural inputs such as fertilizer and farm machinery plus the financial deficit incurred due to the price subsidy for major grains, it is apparent that the financial flow into the agricultural sector far exceeded that out of agriculture into the nonagricultural sector.

Although taxes on the rural sector made an appreciable contribution to gross capital formation, the government financial policy was not executed in such a way as to transfer substantial sums of money out of agriculture to other sectors.

TABLE 10  
RURAL SAVINGS, TAXES AND PUBLIC CHARGES (current prices)  
(Per Household Average)

Year	Per Household Savings		Tax and Public Charges		Number of Households (1000)	Total Savings (million won)
	Amount (won)	Ratio to income (%)	Amount (won)	Ratio to income (%)		
1955	1,570	5.2	1,590	5.3	2,218	3,482
1960	-809	-1.8	1,381	3.1	2,350	-1,901
1965	7,824	7.0	3,062	2.8	2,507	19,466
1970	41,063	16.0	3,283	1.4	2,488	102,165
1975	239,587	27.4	12,687	1.8	2,379	570,008
1977	446,900	31.2	46,100	3.2	2,304	1,029,658

Source: Computed from the data in the *Farm Household Economy Survey, 1955-77*, The Ministry of Agriculture and Fisheries.

## VI. INCREASED DEMAND FOR FARM PRODUCTS

If the contribution of agriculture to Korean industrialization was modest in all areas other than labor supply and income transfer through unfavorable terms of trade in the 1950s and early 1960s, the effect of the rapid growth of industry and foreign trade on agriculture was far greater.

The shift in Korea's population from rural to urban areas created a large increase in the demand for food without a parallel expansion of supply capacity. The result was a rapidly expanding market for agricultural products, especially food items. The major portion of the rise in the urban demand for food came from the growth of the urban population, rather than from any rise in food consumption per person.<sup>3</sup>

<sup>3</sup>The income elasticity of the demand for rice has declined for both urban and rural consumers. One estimate of this income elasticity for urban consumers was .380 in 1965, but it had declined to .021 in 1977. Hence, the influence of per capita income growth on rice consumption has substantially weakened, leaving urban population growth as the major cause of increases in urban demand.

In real terms the urban demand for food has increased nearly four-fold over the past two decades. In 1977, the estimated value of food demand in urban area amounted to 680 billion won (in 1970 constant prices), which was equivalent to the two-thirds of the total gross value of crop production in that year. The rise in rural demand for food was, in contrast, comparatively small since the rural population did not increase during the 1955–77 period.

Estimates show that total domestic food demand increased by about 650 billion won (in 1970 prices) between 1955 and 1977, of which rural demand accounted for about one-fourth, and urban and other non-rural demand for the rest. Not all of this increase in food demand was satisfied by domestic production. A significant portion was supplied through imports from abroad. After 1945 Korea became a net importer of grain and by the 1960s and 1970s grain imports reached a sizable level. Initially the bulk of these imports were funded with the U.S. PL 480 aid, but as Korea's foreign exchange earnings grew, the nation took over payment for the steadily increasing levels of farm product imports. Imports of grain amounted to over 12 percent of domestic production in the late 1960s and to over 20 percent in the first half of the 1970s. This rise in imports must have cut into the demand for domestic grain.<sup>4</sup>

However, any attempt to extract a large amount of grain out of the rural areas for the urban population would have been difficult. Even if the terms of trade toward agriculture had drastically improved, expansion of output to meet the growing demand would have been impossible in view of the limited land resources. Therefore, it was basically industrialization which, by contributing to a rapid rise in foreign exchange earnings, helped Korea to maintain the national food balance which was beyond the capacity of Korean agriculture alone.

Rapid economic growth and the subsequent increase in income levels have also brought about considerable changes in food consumption patterns. Tastes shifted from carbohydrates to protein foods such as meat and processed foods. The demand for vegetables and fruits has also increased rapidly. The proportion of expenditures on cereals in total consumption expenditures for the average urban household declined from 34 percent in 1963 to about 15 percent in 1977. The shift in consumption patterns in urban areas evidently induced Korean farmers to cultivate more cash crops, which brought higher returns to the labor-intensive

<sup>4</sup>Had Korea avoided the PL 480 grain imports because of fear of their depressing effect on farm production, one conceivable solution for food shortage would have been imposition of compulsory grain delivery quotas on farm producers in order to feed urban population. Compulsory quotas would have certainly lowered farmer incentives to increase output (as experienced in the first half of 1940's under the Japanese occupation) since the typical farmer could not be sure whether an increase in output would raise his income or simply his delivery quota.

factor endowment of the rural areas than grain. As *Table 12* indicates the share of revenue from cash crops and livestock in the total revenue for the average farm household increased from 8 percent in 1955 to 20 percent in 1977.

Rising foreign exchange earnings also contributed to the growth of Korean agriculture in many other ways. For one thing, the imports of fertilizer in earlier years, and later production from domestic plants, and other inputs were made possible by the expansion of the foreign exchange-earning capacity of the country. Furthermore, increases in foreign exchange earnings made it possible to repay the foreign loans that have been used to finance various agricultural projects. Thus, Korea's export-led industrialization contributed greatly to the rise in agricultural productivity.

TABLE 11  
ESTIMATED FOOD EXPENDITURES BY NONFARM HOUSEHOLDS

Year	Number of Nonfarm Households (1000)	Monthly per Household Food Expenditures (won)	(1970 constant prices)	
			Total food Expenditures	
			Monthly (million won)	Annual (million won)
1955	1,548	10,000	15,480	185,760
1960	1,969	10,000	19,690	236,280
1965	2,338	9,670	22,610	280,560
1970	3,374	12,120	40,890	404,880
1975	4,032	10,620	40,400	483,840
1977	4,330	13,123	56,823	681,871

Source: Computed from the *Urban Household Living Expenditures Survey, 1955-77* (The Economic Planning Board).

TABLE 12  
INCREASING SHARE OF NONGRAIN CASH CROP REVENUE

Year	All grain %	Cash crop* %	Livestock %	Sericulture %	Others** %	Total %
1955	73.2	6.7	1.6	.3	6.4	100.0
60	70.9	11.8	2.2	.2	14.9	100.0
65	71.9	9.0	2.7	5.7	10.7	100.0
70	61.0	12.7	3.3	5.5	17.5	100.0
75	55.9	12.8	3.2	4.6	23.6	100.0
77	55.1	16.3	3.4	2.2	23.0	100.0

\*Includes cash crops, vegetables and fruits.

\*\*Includes changes in value of animals, trees and other stocks.

Source: Computed from the data in the *Farm Household Economy Survey, 1955-77* (The Ministry of Agriculture and Fisheries).

## VII. CONCLUSION

In regard to the role of agriculture as a source of investment financing for the nonagricultural sector, Korean farmers have saved little and invested little, if any, of their savings until recently. Taxes on the rural sector were very light, amounting to no more than 2 or 3 percent of farm household income. In fact, it was not until the 1970s that there was any net cash flow out of agriculture at all.

Labor is a different story. The massive transfer of surplus farm labor, combined with the government policy of maintaining agricultural prices low in the 1950s and early 1960s contributed to keeping urban wages at a relatively low level in favor of the expanding industrial sector. Moreover, the investment in the education of the rural population represents one of the most significant roles of Korean agriculture in the process of economic growth.

On the other hand, the farm population has greatly benefited from the rapid growth of the nonfarm sectors. Rapid urbanization and industrialization have not only created a large increase in the demand for agricultural products, but also caused a substantial shift in urban food consumption patterns toward higher-quality foods. This shift in the consumption pattern has provided a great incentive for farmers to expand the cultivation of more profitable cash crops, instead of concentrating on grain crops.

The growth of industry has also provided increased employment opportunities outside of agriculture, thus preventing further fragmentation of the existing small-scale farms. Large increases in foreign exchange earnings accruing mainly from the exports of industrial products made it possible to import fertilizer plants and farm machinery plants, as well as technical know-how. The improved payments position also enhanced the nation's capability to tap more foreign loans to finance various agricultural projects such as irrigation and other rural infrastructure. Thus Korea's industrialization, urbanization, and export policy have all contributed to the growth of agricultural productivity. Consequently, Korea is an example of a growth model in which the industrial revolution preceded the agricultural revolution.

However, this is not to say that agriculture will always remain as a major beneficiary of industrialization. Despite its declining significance in the overall economy, agriculture is expected to assume an increasingly important role in the future. It will continue to provide the main source of income for the rural population and food for the growing and increasingly affluent urban population. Growing rural demand for inputs and consumer goods will provide an important stimulus for the expansion of manufacturing and service industries. In the long run, therefore, reciprocal interaction between agriculture and industry will be of key

importance in sustaining a high rate of overall economic growth.

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