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THE EVOLUTION OF RICE POLICY IN KOREA†

Although the role of agriculture in the Korean economy has declined in recent years, it still accounted for 26 percent of the total gross national product (GNP) in 1974. Of the GNP originating in agriculture, rice alone constituted approximately 50 percent. In the daily diet about half of the total caloric intake comes from rice. Rice occupies almost 18 percent of urban household expenditures and 27 percent of farm household expenditures.

Rice is the major determinant of farm income due to its dominance in production. Although the contribution of rice to farm income varies among farms of different sizes, data from the *1974 Farm Household Economy Survey* show that on average about half of gross receipts originated from rice cultivation. For farms with less than half a hectare, approximately 41 percent of total receipts was contributed by rice; for the farms larger than two hectares its contribution was over 55 percent.

Because rice is by far the most important single commodity in Korea, the Korean economy is often referred to as a rice economy and the term rice policy is used as a synonym for food policy. For this reason, it is no exaggeration to say that the success or failure of the nation's food policy or even economic policy depends to a great extent upon how effectively rice policy is designed and implemented.

GEOGRAPHIC CHARACTERISTICS AND LAND RESOURCES

Korea is a peninsula which lies in the path of tropical cyclonic storms, typhoons originating in the southern Pacific in the summer. The summer monsoon carries warm, moist air to South Korea from the southeast. Annual rainfall averages from 40 to 55 inches, but is heavier along the southern coast, averaging about 60 inches. In the west where most rice is grown, rainfall averages about 45 inches. June to September is the period of heaviest rainfall. Rainfall is very light from November to February, the "dry winter period." The rice crop is sometimes adversely affected by early droughts which delay transplanting and by late droughts which interfere with crop maturation.

Land in the valley and river plains has been shaped into paddies that are

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TABLE 1.—LAND USE*
(thousand hectares)

	1951	1961	1974
Cultivated	1,958	2,049	2,238
Paddy	1,159	1,221	1,269
Upland	799	828	969
Forest	6,469	6,809	6,640
Other use	1,496	1,066	1,082
Total	9,925	9,925	9,960

* Data from the Ministry of Agriculture and Fisheries, *The Agricultural Statistics Yearbook* (Seoul, December 1974).

irrigated or flooded by rainwater during the warm months. The coarse alluvial soils are easy to work. They tend to be suitably drained and also are satisfactory for dryland crops, such as barley, soybeans, millet, and various kinds of vegetables. Nearly all areas of podzolic soils, which occur intermittently along the coast, are used intensively for crop farming, especially for rice.

In Korea limited land resources are a major constraint on expanding crop production. If we compute percentages from the data in Table 1, we find that only about 22 percent of the total land area is under cultivation. About 67 percent is classified as forest, although a large portion of this land has little forest growth. Of the total cultivated area, about 57 percent is paddy land. The total acreage of rice paddy increased from 1,159,000 hectares in 1951 to 1,269,000 hectares in 1974. Though the government attempted to expand paddy area by developing the tideland in the western coastal region, the high cost of construction was a serious constraint. Government support for these projects was withdrawn, and emphasis was shifted to improving irrigation facilities for paddy land already under cultivation. Substantial new development of paddy area seems unlikely. Moreover, some high quality paddy land is being lost through urbanization and the expansion of industrial plants. Increased rice production will depend largely on raising yields of existing paddy land.

PRODUCTION AND CONSUMPTION

Rice is the major crop grown in Korea, comprising about 42 percent of the total value of crop production and 37 percent of the total planted acreage in 1974 (including double-cropped areas). Despite its steady growth (shown in Table 2), rice production has been lagging behind the rapid increase in consumption. In an effort to achieve food self-sufficiency, particularly in rice, the government formulated and implemented a series of rice production plans. As already stated, the supply of paddy land is almost completely inelastic due to the limited availability of land as well as to the low substitutability in land use between paddy and upland crops. The source of increased production mainly stems from increases in land productivity brought about by the improvement of irrigation facilities, expanded use of fertilizers and chemicals, introduction of high-yielding rice varieties, and improved cultivation practices.

TABLE 2.—RICE PRODUCTION, AREA, AND YIELD, INCLUDING UPLAND RICE, 1961-74*

Year	Area planted (thousand hectares)	Yield per hectare (kilograms)	Total production (thousand metric tons)
1961	1,137	3,040	3,015
1962	1,148	2,630	3,758
1963	1,165	3,230	3,954
1964	1,205	3,280	3,954
1965	1,238	2,830	3,501
1966	1,242	3,160	3,919
1967	1,246	2,890	3,603
1968	1,160	2,750	3,195
1969	1,230	3,330	4,090
1970	1,213	3,250	3,939
1971	1,200	3,330	3,998
1972	1,201	3,290	3,957
1973	1,182	3,560	4,211
1974	1,204	3,690	4,445

* Data from the Ministry of Agriculture and Fisheries, *The Agricultural Statistics Yearbook* (Seoul, December 1974).

TABLE 3.—ACREAGE OF PADDY LAND BY IRRIGATION STATUS, 1961-74*
(thousand hectares)

Year	Fully irrigated	Partially irrigated	Rain-fed	Total
1961	238	664	230	1,632
1962	256	669	218	1,143
1963	264	679	215	1,158
1964	277	706	208	1,191
1965	284	725	200	1,209
1966	288	740	179	1,214
1967	295	740	179	1,214
1968	238	705	146	1,136
1969	298	765	141	1,208
1970	307	773	113	1,193
1971	310	768	100	1,178
1972	314	774	90	1,178
1973	320	766	84	1,170
1974	309	872	88	1,269

* Data from the Ministry of Agriculture and Fisheries, *The Agricultural Statistics Yearbook* (Seoul, December 1974).

As shown in Table 3, both fully-irrigated and partially-irrigated paddy land have been steadily increasing; rain-fed paddy land shows a downward trend. The government has put into effect several programs of large-scale water resource development in addition to the subsidized diffusion of small-scale water pumps.

Fertilizer consumption more than doubled from 1961 to 1974. The total quantity of plant nutrients used per hectare of rice increased from 129 kilograms in

1966 to 175 kilograms in 1974. This increase was due in large part to the policy of making fertilizer available to farmers at low prices. The cost of nitrogen and phosphates declined between 1966 and 1974, while that of potash increased by about one-third. At the same time, prices of rice more than doubled. The quantity of rice required to purchase one kilogram of plant nutrients declined from 1.3 kilograms in 1966 to 0.5 kilogram in 1974, indicating increasingly favorable price terms.

Another important factor in the growth in yield was the diffusion of improved rice varieties. Especially notable is the recent development of a new rice variety, IR 667 (Tongil). It is a cross-bred, nitrogen-responsive variety originally developed at the International Rice Research Institute (IRRI). According to official estimates in 1974, the average yield was 5,000 kilograms of polished rice per hectare. The area of paddy planted with this variety was expanded to 306,000 hectares in 1974, one-fourth of the total paddy land.

The total consumption of rice increased from 3,485,000 metric tons in 1961 to 4,774,000 metric tons in 1974, while domestic supply increased from 3,047,000 to 4,445,000 metric tons, respectively. Imports filled the gap. During the same period, population grew from 25,498,000 to 33,459,000, an average annual growth rate of about 2.1 percent. Average per capita national income recorded a remarkable growth, from U.S.\$95 in 1961 to U.S.\$404 in 1974. Even though domestic rice production grew steadily, it could not keep pace with increasing demand due to population and income growth.

The Korean Government has made various efforts in the past decade to increase food grain production. Nevertheless, the gap between supply and demand has been widening in recent years. The rate of self-sufficiency in all grains was about 93 percent in 1962, but it declined to 69 percent in 1974. About 80 to 90 percent of total rice requirements have been met by domestic production in recent years.

Rapid economic growth and the resulting increase in income levels have brought about considerable changes in food consumption patterns. A gradual shift from carbohydrate sources to protein foods, such as meat and processed foods, occurred. The proportion of expenditures on cereals in total consumption expenditures was 34 percent for the average urban household in 1963, but it declined to about 20 percent in 1974. For the average farm household, this proportion decreased from 47 percent to 37 percent during the same period.

Income elasticity of demand for rice has also declined for both rural and urban consumers. One estimate of this income elasticity for urban consumers was .380 in 1965 and .124 in 1972 (6, p. 54). Hence, the influence of per capita income growth on rice consumption is gradually declining in urban areas, leaving urban population growth as the major cause of increases in urban demand.

The income elasticity of demand for rice by farm households has also declined. Results from one study are .638 in 1965 and .329 in 1972 (6, p. 54). The higher income elasticity of rural consumers suggests that the potential for increasing consumption of rice is greater in rural areas than in urban areas. In addition, the evidence shows differences among income groups. Lower income groups have a higher income elasticity, indicating that future increases in consumption will occur mainly in lower income groups.

EVOLUTION OF RICE POLICY

Policy Prior to 1948

Before 1939 Korea was a rice-exporting country, and Japan was its principal export market. There were no government controls over grain marketing. In 1939 a serious crop failure due to drought occurred in both Korea and Japan. In addition, demand for rice was unusually strong because of the Sino-Japanese War which had begun in 1937. As a consequence, the Japanese colonial authorities in Korea enacted several control measures designed to achieve a more equitable distribution of food supplies and to make possible continued exports of rice to Japan.

Government-controlled grain associations were formed to buy rice for the government. An administrative order was issued requiring farmers to sell a portion of their rice to the government. Several regulations were also issued requiring lower polishing rates, curtailment of the use of rice for manufacturing alcoholic beverages, and other rice-saving measures.

A series of these compulsory measures, especially low purchase prices paid to Korean rice producers, had a negative effect on rice production efforts and resulted in a shortage of rice in Korea. To fill this gap, cheap cereals, such as millet, corn, and sorghum, were imported from Manchuria.

Japan's subsequent involvement in World War II in 1941 led to further demands for grains by the military and to a drastic deterioration in the overall food situation in Korea. Food control measures were intensified to cope with the situation. In 1943 the Food Control Law closed down the free market for grains. The government was given full authority to regulate food grain marketing and to purchase all grain except that needed by farmers for home consumption and seed use. A Food Administration Division was established in the Bureau of Agriculture of the Governor-General's Office, and food divisions were set up in the local governments to administer food grain programs at the local level.

In 1944 compulsory grain delivery quotas were assigned to all farmers, and rations were consigned to all consumers. Ration levels ranged from .864 kilograms per day for heavy workers to .216 kilograms for persons under 15 and over 60 years of age; the general population received an average per capita ration of .360 kilograms per day. The Chosen Food Corporation was formed to carry out the physical handling of the grain as the sole government food agency. The corporation's activities included collecting, transporting, storing, milling, distributing, exporting, and importing grain. Prices paid to farmers were so low that the farmers' main concern was to minimize the actual delivery of grains. Prices paid by consumers were determined after considering consumer living costs and the general price level. This complete control system continued until the end of World War II.

During the colonial period, the Japanese government initiated a series of Rice Production Increase Plans. The implementation of these plans involved many compulsory measures in the rural areas of Korea, and they were not designed to improve farm income or diets. Nonetheless, the productivity of Korean agriculture was fostered through the introduction of improved rice varieties, the diffusion of improved cultivation methods, and the distribution of chemical fertilizer.

After liberation in August 1945, the U.S. military authorities discontinued the food rationing system and restored free market transactions for all grain. The military government apparently believed that Korea had a substantial surplus of food grains. The past records of rice exports from the country were undoubtedly responsible for this view.

The removal of controls, however, aggravated the imbalance between supply and demand. Repatriation of approximately 1.2 million Koreans from abroad, the influx of refugees from North Korea, and the people's relief at being freed from tight food controls caused a sharp rise in rice consumption. The wholesale price of polished rice rose from 1.0 *won* (W) per 80 kilogram bag in October 1945 to W6.0 in 1947. The wholesale price index rose almost ten times during the same period, providing evidence of strong general inflationary forces. At the time the food decontrol ordinance was issued, transportation, communication, banking, and market facilities were totally inadequate to meet the needs of a free economy.

Fearing the political, economic, and social confusion resulting from this sudden changeover, the U.S. military authorities were forced to reconsider the free market system. In order to stabilize overall prices and protect the incomes of urban consumers, the military regime adopted retail ceiling prices for the 11 major consumer items, including rice and cotton cloth. The Central Price Administration was organized to implement the price controls, including determining ceiling prices, inspecting markets, and providing regulations for punishing violators.

The government's ceiling prices were never honored in the market; hoarding and black-marketing prevailed. Consumers who had been completely dependent upon government rations for their staple food supplies suddenly found the rationing eliminated with no other adequate source of supplies available. The real cause of the rice price spiral was an increased demand for rice combined with overall price increases resulting from post-war inflationary pressures.

Having recognized the failure of the ceiling price system, the U.S. military authorities revised the grain policy. The Rice Collection Decree of January 1946 permitted direct government intervention in the grain market. Since rice was thought to be one of the major factors affecting general price levels, the military authorities believed that direct government control of sufficient rice stocks would be more effective in counteracting inflation than price control schemes. The free market for grain was once again closed, and compulsory rice collections from farmers and a complete ration system for urban consumers were enforced. The National Food Administration was formed under the military governor, with branch offices at local levels. The Korea Commodities Company was established to carry out the marketing functions previously performed by the Chosen Food Corporation. The only significant difference between the organization of grain management under the U.S. military government and that under the earlier Japanese Governor-General's Office was the establishment of the National Food Administration as a separate agency directly responsible to the military governor, rather than as a food administration office in the Agriculture Bureau.

The military government instituted a program in February 1946 to collect 761,000 metric tons of rice (polished equivalent) from the 1945 crop. But it was

too late. Most rice had already left the farmers' hands, and actual collection was only 80,000 metric tons. The remainder of the crop, other than that consumed by farmers, was sold on the black market. The military authorities resorted to rice imports in the spring of 1946 to provide minimum supplies to large consuming centers. A partial rationing program was initiated for a limited number of the most needy families in the major cities. The amount of the ration was .14 kilogram per person per day. In September 1946 the basic ration was increased to .36 kilogram per person per day and was extended to all non-self-suppliers. The expansion of the rationing program was made possible by significantly increasing rice imports and by the successful collection of a major portion of the 1946 rice crop. This program of rationing grain was continued throughout the period of military government.

Although this policy helped to balance the overall supply and demand for the staple food and alleviated the inflationary forces arising from the grain sector, it reminded the public of the compulsory ration system under Japanese rule. Moreover, due to the lack of administrative ability and to the dearth of adequate statistics on rice production, it was difficult to allocate government purchase quotas fairly among different localities and individual farmers.

Policy During the 1948-60 Period

In August 1948 U.S. military government operations were terminated, and the government of the Republic of Korea was established. Soon afterward the Ministry of Agriculture and Forestry was set up, which included the Food Administration Bureau to administer the government food grain program. The Food Administration Bureau replaced the National Food Administration and absorbed all of that agency's personnel and responsibilities. At the same time, the physical handling of grain was transferred to the Federation of Financial Associations, predecessor of the present National Agricultural Cooperatives Federation (NACF).

In November 1948 the government abolished the old decree and replaced it with the Grain Purchase Law. The major provisions of the new law were virtually the same as those of the old decree. Grain producers and landowners were required to sell to the government all their grain other than that required for home consumption and seed. Free market transactions and transportation of grain except for home use were prohibited. Finally, the government purchase price of grain was to be determined on the basis of cost of production, cost of living, the general price level, and other pertinent economic factors.

The policy under this legislation was originally intended to improve farm income through government purchase at an adequate price level and at the same time to secure a stable supply of food grain for urban customers. However, the government could not procure sufficient rice to implement the system of rationing. There were two main reasons for this failure. First, the purchase price was much lower than the market price of rice. Second, the budgets allocated for grain purchases were too small. According to the official records, the government planned to secure 1,087,000 metric tons of rice from farmers in 1948. But despite a bumper rice crop, the actual quantity purchased was only 560,000 metric tons, 52 percent of the initial target.

Under these circumstances, a fundamental change in policy was considered inevitable. It was impossible to implement overall rationing of food grain with only half the amount required. The Temporary Food Counter-Emergency Law was enacted in July 1949. Under this law, overall control was lifted, free market transactions were permitted, and the overall rationing system was converted into a priority ration system. The first claim to the limited, government-controlled grain supply was given to the military, police, government employees, and workers in critical industries, such as coal mining. Rations for other categories were reduced in proportion to the amount of food grain supplies available for rationing. Urban consumers not receiving rations were able to procure their requirements from the open market.

The Temporary Food Counter-Emergency Law was originally scheduled to terminate at the end of October 1949. However, the law remained in effect until February 1950 when it was replaced with the Grain Management Law, which continues to be the basic legal authority for food grain policy.

The principal provisions of the law stated:

1. Rice producers can be required to sell up to one-third of the harvest to the government. Grain for family consumption and seed use is excluded from this compulsory sale.
2. The government is required, subject to the approval of the National Assembly, to formulate an annual plan for food grain operations, including targets for the quantity of grain to be purchased each year and for the purchase price.
3. The government is required to keep grain stocks on hand to meet emergencies.
4. The government may, if necessary, regulate all phases of all transactions in grain.
5. The budget required to carry out grain programs is to be a separate account.

The primary intent of this law was to enable the government to secure sufficient grain from domestic farmers and thus stabilize grain prices by controlling grain distribution and consumption through government stock operations.

Since the enactment of the Grain Management Law, the grain market in Korea has remained a dual system combining free market transactions and government control, though the degree of market intervention has varied from year to year. Free market transactions were tolerated by the government although it had full legal authority for complete regulation of grain markets. The government also had authority to import or export grain. Importers and exporters as well as grain processors were required to obtain authorizations. The government could give "necessary orders" to hotels, restaurants, grain dealers, transporters of grain, and grain processors (e.g., on the mixing of rice and barley) when it considered them necessary for management of the grain supply. It also took over administration from the Korea Federation of Financial Associations and conducted directly the procurement, transportation, storage, milling, and sales of the government-controlled grain.

Following the outbreak of the Korean War in June 1950, securing military grain and distributing relief grain to war refugees emerged as priority issues in food grain administration. The annual quantity of rice needed for government

operations was estimated at about 600,000 to 700,000 metric tons. Due to the enormous wartime budgetary requirements, monetary inflation, and spiraling grain prices, the government was obliged to discontinue the direct purchase of rice from farmers during the 1952-53 period. Instead, an attempt was made to secure rice by reimbursement for farmland distributed to tenant farmers at the time of the land reform in June 1949.¹ Because of the successive crop failures in 1951 and 1952, however, it was impossible for the government to collect the required amount of rice under the farmland payment scheme.

To check the inflationary spiral and secure sufficient rice for government stocks, in September 1951 the government legislated the Provisional Farmland Tax Law, a measure to collect a land tax in kind. At the same time a scheme to barter fertilizer for rice was initiated, which was seemingly a retrogression to a former practice. The 1951 rice-land tax collections achieved 95.4 percent of the collection goal, and the 1952 barley tax collection exceeded the goal by 19.4 percent. It appears, therefore, that land tax collections were administered efficiently. But the government had considerably less success in the collection of rice through farmland repayments and through the barter program. In the implementation of the barter program, the rate of exchange was 1 kilogram of polished rice or 1½ kilograms of polished barley for 3 kilograms of ammonium sulphate (or equivalent). The implicit grain price in applying these exchange ratios was below market value.

The government had two principal motivations for establishing low rice 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 others who were assumed to be less able to buy food at open market prices than "normal" customers. 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. These landlords were given government bonds, the face value of which were stated in terms of rice and were to be paid off by the government over five years in equal annual installments.

Farmers suffered from this system. Table 4 gives the estimated financial loss of the farmers due to the low pricing of rice. These losses ranged between W213 million in 1950 and W1,886 million in 1955.

Foreign grain was imported to secure adequate stocks of grain and to stabilize consumer prices in the urban areas. The importation of 210,000 metric tons in 1951 and 450,000 metric tons in 1952 largely alleviated food shortages but had little effect on soaring grain prices. In 1953 the government imported an unprecedented 960,000 metric tons which finally brought rice prices down. Combined with a bumper crop in 1953, the ample supply of rice resulted in a sharp decline in the prices of rice and other grain.

Policy makers now had to prevent further declines in rice prices. Because

¹ Land reform and vested land payments were provided for under the Land Reform Law (No. 31) passed in June 1949 which specified that payments by new owners for lands formerly owned by Korean landowners and for vested lands formerly owned by Japanese were to be made in five annual installments. Total payment for any particular plot of land was to be 150 percent of the average annual yield of the main crop on that land. A presidential decree issued in February 1950 set the law in motion and provided for payments to be made in kind for land producing grain. These payments were initiated with the 1950 summer crop.

TABLE 4.—FARMERS' FINANCIAL LOSSES RESULTING FROM SALES TO GOVERNMENT*

Crop year	Quantity of sales (thousand metric tons)	Market price ^a (won/80 kg)	Government price (won/80 kg)	Loss (won/80 kg)	Total loss (million won)
1950	538	53	21	32	213
1951	266	142	74	68	227
1952	268	513	221	292	978
1953	400	534	221	313	1,564
1954	333	398	340	94	389
1955	246	1,043	429	614	1,886

* Data from Bank of Korea, *Economic Statistics Yearbook* (Seoul, December 1974).

^a November–January average farm price.

falling prices impoverished the rural economy, a policy of farm support was reintroduced.

The direct purchase scheme was resumed, and, ironically, the government planned to export rice to Japan. The government purchase price, hitherto less than half the market price, was for the first time set at a level close to the market price for the 1954 rice crop. The policy contributed to stabilizing rice prices during the 1954 fall season. But these stable rice prices did not last long. Prices began to rise sharply again in May 1955. In major cities the government released rice stocks, including those once reserved for export to Japan, in order to cope with the situation. The lack of consistency in policy was partly the result of inaccurate estimates of food grain supply and demand.

Korean food policy was drastically changed with the signing of the U.S. Farm Surplus Importation Agreement in 1955. Prospects were bright for more or less balanced food grain supplies. The acquisition of grain, excluding rice, for the government use was relatively easy under this new aid source. U.S. farm products imported under this agreement were wheat, barley, raw cotton, corn, sorghum, and tallow, of which wheat and barley accounted for about 50 to 60 percent of the total value of imports. The quantity of grain imported was on the average equivalent to 9 percent of the annual domestic grain production during the 1956–60 period. The average annual food grain shortage during this period was estimated at about 600,000 metric tons. To meet this shortage, a total of 3,170,000 metric tons of grain was imported, of which imports under U.S. Public Law (PL) 480 reached 2,954,000 metric tons or roughly 93 percent. The data in Table 5 demonstrate the important role of PL 480 imports in the overall food grain supply during this period. From 1956 through 1964, the total value of grain brought in under PL 480 amounted to U.S.\$425 million, an average of U.S.\$47 million every year. The availability of large quantities of aid grain from the United States purchased with local currency permitted a major easing of foreign exchange constraints.

Although the significant contribution of PL 480 grains to general economic stability has been recognized, there has also been concern over the possible negative effects on domestic grain production resulting from lower market prices for grain. No attempt is made here to appraise all the effects of PL 480 grain im-

TABLE 5.—DOMESTIC PRODUCTION AND IMPORTS OF GRAIN, 1956-64*
(thousand metric tons)

Year	Domestic production		Imports		PL 480 rice	Total grain imported/ total grain produced (percent)	PL 480 imports/ total grain produced (percent)
	All grain	Rice only	Total	PL 480			
1956	4,310	2,438	502	500	135	11.7	11.6
1957	4,744	3,002	965	770	17	20.3	16.2
1958	5,189	3,161	968	949	4	18.6	18.3
1959	5,359	3,150	267	267	4	5.0	5.0
1960	5,271	3,047	468	468	0	8.9	8.9
1961	5,933	3,463	603	407	0	10.2	6.9
1962	5,423	3,015	499	483	0	9.2	8.9
1963	5,742	3,758	1,318	1,014	0	23.0	17.7
1964	7,066	3,954	916	607	0	13.0	8.6

* Data from the Ministry of Agriculture and Fisheries, *Grain Statistics Yearbook* (Seoul, December 1974).

ports. One possibility, however, is that the easy availability of free grain may have provided an incentive to food administrators to overestimate grain shortages and a disincentive to government officials responsible for increasing domestic production.

Policy During the Stabilization and Growth Period, 1961-74

The student revolution in April 1960 and the military revolution in May 1961 significantly influenced most political, social, and economic relationships in Korea. To avert social and economic confusion the military government froze all commodity prices to the level of May 15, 1961. After the economy was gradually stabilized, in July 1961 the government then lifted the control on all prices except those of essential daily necessities, including rice, barley, and wheat flour.

Following the serious crop failure in the fall of 1962, however, grain prices began to soar again, and the government was compelled to abandon the freeze on grain prices. The crop failure of barley in the summer of 1963 caused a further deterioration in the food situation. Market supplies of grain became scarce in June 1963 due to hoarding by both farmers and dealers who anticipated a poor summer crop. As a countermeasure to the upward spiral of prices, which was almost comparable with that of 1950, the government released its stocks in major cities through public auctions. However, this indirect measure failed to stabilize grain prices because insufficient stocks were available for sale.

Direct measures were initiated including setting a ceiling price for rice, establishing production and distribution quotas for all flour mills, and controlling rice consumption by restaurants. In spite of the normal crop in the fall of 1963, rice prices increased even more sharply in early 1964 in response to increased inventory demand by both grain dealers and urban consumers. The government was thus forced to raise the ceiling price from the original level on several occasions. Finally, the price ceiling was lifted in June 1964. The price of rice continued to rise until after the new harvest in the fall of that year.

After production increased in the following year, grain prices remained stable, and grain markets were restored to normal status. These results were facilitated by a gradual increase in imports.

Rapid industrial growth during the first (1962-66) and the second (1967-71) plan periods was the major objective of the development strategy. Therefore, the industrial sector received higher priority in investment allocations. Self-sufficiency in rice was not achieved under these two plans. In the Third Economic Plan (1972-76), however, self-sufficiency in rice is listed as one of the priority targets. Investments in the agricultural sector are scheduled to rise from 6 percent of the total development budget during the first and second plans to almost 12 percent in the third plan.

The third plan calls for an increase in rice yield from 3,380 kilograms per hectare in 1972 to 4,000 kilograms by 1976. The total production of rice is expected to increase from 4,104,000 metric tons in 1972 to 4,860,000 metric tons in 1976, approximately an 18.5 percent increase during the five-year period. To achieve this target, the government has continued to encourage the increased use of fertilizer, pesticides, and lime. Average fertilizer prices to farmers are to be maintained at the 1965 level, pesticides are to be heavily subsidized, and lime is to be distributed almost free. The plan also calls for a massive increase in investments for land and water resource development. High priority is placed on the expansion of irrigation facilities through paddy consolidation projects and establishment of small-scale pumping stations.

Historically, the government's major emphasis in rice policy was directed toward maintaining low prices for urban consumers and preventing wide seasonal price fluctuations rather than maintaining adequate prices to support farm incomes. The government purchase price had always been below market prices, and rice was, in effect, requisitioned from farmers through local administration channels. Because of the major role of rice in the Korean economy, low rice prices were regarded as one of the most effective tools in achieving general price stability.

However, in the face of growing income disparity between urban and rural families and of increasing food shortages, policy makers were obliged to give serious consideration to a more equitable income distribution and expansion of food grain production, and, in particular, to achieve self-sufficiency in rice production. Starting with the 1968 rice crop, the government raised the purchase price by 17 percent over the 1967 price. For succeeding rice crops the rate of annual increase was 23, 36, 25, 13, and 10 percent. Despite these increases, the ratio of the purchase price to the market price fell between 1970 and 1973. The evolution of prices between 1953 and 1973 is shown in Table 6.

At the same time, the government put into effect a two-price system for barley to reduce rice consumption and increase barley consumption. The price of barley has been maintained at a relatively low level for urban consumers. Prior to 1968 the price of barley was about two-thirds the price of rice, but in 1969 the price of barley for urban consumers was lowered to about half that of rice.

Other measures were also taken to encourage consumers to substitute barley and other grains for rice in their diets. Restaurants were required to serve a mixture of 75 percent rice and 25 percent barley. They were also required to serve

TABLE 6.—RICE PURCHASE PRICES AND MARKET PRODUCER PRICES, 1953-74*
(won per 80 kilograms of polished rice)

Crop year	Purchase price		Market price ^a		Purchase price/ market price
	(won/80 kg)	(percent increase)	(won/80 kg)	(percent increase)	
1953	190	73.0	677	—	28.1
1954	330	73.0	865	27.8	38.2
1955	417	26.6	828	-4.3	50.4
1956	1,130	171.2	1,528	84.5	74.0
1957	1,130	0	1,180	-22.8	95.8
1958	1,130	0	1,098	-7.0	102.9
1959	1,130	0	1,011	-7.9	111.8
1960	1,130	0	1,340	38.8	84.3
1961	1,550	46.4	1,404	4.8	110.4
1962	1,780	14.8	1,793	27.7	99.3
1963	2,056	15.5	2,635	47.0	78.0
1964	2,967	44.3	3,032	15.1	97.9
1965	3,150	6.2	3,000	-1.1	105.0
1966	3,306	5.0	3,140	4.7	105.3
1967	3,590	8.6	3,642	15.7	98.6
1968	4,200	17.0	4,937	35.9	85.1
1969	5,150	22.6	5,354	8.4	96.2
1970	7,000	35.9	6,596	23.2	106.1
1971	8,750	25.0	8,462	28.3	103.4
1972	9,888	13.0	9,750	15.2	101.4
1973	11,377	15.1	11,000	12.8	103.4
1974	15,760	38.5	16,652	51.4	94.6

* Data from the Ministry of Agriculture and Fisheries, *Grain Statistics Yearbook* (Seoul, December 1974).

^a November-January average prices at local markets.

noodles and other non-rice food grains on Wednesdays and Saturdays. Lunches carried by school children had to contain a similar mixture.

While accurate estimates of the net effect of these policies are not available, comparisons of the quantity of government-controlled grains released to the market indicate that the two-price system for barley was somewhat successful in diverting consumption away from rice. The amount of rice saved by this policy was officially estimated at 600,000 metric tons in 1972.

Performance of Government Rice Programs

The grain management programs represent one of the largest nondefense activities of the Korean Government. Official agencies acquire grains from farmers through several programs at government-controlled prices during the harvest season. Major acquisition programs include direct purchases, barter of fertilizer for rice, rice-liens (nonrecourse loans), and collection of harvest taxes in kind. Previously, acquisition programs mainly centered on rice, but recently the share of barley has been substantially expanded. If the government cannot secure a sufficient amount of domestic grain, the gap has been filled by grain imports. The degree to which grain prices have been stabilized has depended largely on

TABLE 7.—DIRECT PURCHASES OF DOMESTIC RICE, 1953-74*
(thousand metric tons of polished rice)

Crop year	Planned purchases	Actual purchases	Ratio of actual to planned purchases (percent)
1953	144	121	84.0
1954	144	16	11.1
1955	158	145	91.8
1956	144	72	50.0
1957	—	—	—
1958	—	—	—
1959	—	—	—
1960	—	—	—
1961	308	200	64.9
1962	216	193	89.4
1963	98	64	65.3
1964	115	66	57.4
1965	65	58	89.2
1966	86	77	89.5
1967	341	107	31.4
1968	346	21	6.1
1969	403	162	40.2
1970	224	244	108.9
1971	271	405	149.5
1972	635	438	69.0
1973	494	420	85.0
1974	642	668	104.0

* Data from the Ministry of Agriculture and Fisheries, *Grain Statistics Yearbook* (Seoul, December 1974).

the availability of grain in government stocks. Discussion here is restricted to the past performance of acquisition programs.

Direct purchase of grain.—The bulk of rice, barley, and other grains is purchased from farm producers at prices announced shortly after harvest. Data on direct purchases of rice are contained in Table 7. Grains are purchased at government purchasing stations at various localities. By 1974 the number of stations had increased to over 4,000 to facilitate delivery by farmers.

Barter of fertilizer for rice.—The barter of fertilizer for rice is the second largest source of government rice supplies. Under this program, farmers obtain fertilizer from the National Agricultural Cooperative Federation by paying cash equivalent to 40 percent of the fertilizer cost; the remaining cost is paid by rice delivered after the harvest. Since the government sells fertilizer at a heavily subsidized price, farmers find it more advantageous to purchase fertilizer with cash rather than in exchange for fixed quantities of rice. As shown in Table 8, the quantity of rice delivered under this program has been declining in recent years.

Rice-lien program.—The rice-lien program is not precisely a part of the government acquisitions programs. However, it is discussed here because it is an important part of Korean rice policy. The rice-lien program is analogous in principle to the nonrecourse price-support loans made by the Commodity Credit Corporation in the United States. The government is authorized to provide non-

TABLE 8.—QUANTITY OF RICE DELIVERED UNDER RICE-FERTILIZER
BARTER PROGRAM, 1953-74*
(thousand metric tons of polished rice)

Crop year	Planned delivery	Actual delivery	Ratio of actual to planned deliveries (percent)
1953	—	3	—
1954	—	—	—
1955	—	—	—
1956	65	63	96.9
1957	15	11	73.3
1958	9	2	22.2
1959	—	—	—
1960	—	—	—
1961	104	99	95.2
1962	219	85	38.8
1963	160	119	74.4
1964	58	23	39.7
1965	134	150	111.9
1966	156	155	99.4
1967	146	114	78.1
1968	115	78	67.8
1969	96	101	105.2
1970	102	70	68.6
1971	70	68	97.1
1972	51	33	64.7
1973	46	32	69.6
1974	30	23	76.7

* Data from the Ministry of Agriculture and Fisheries, *Grain Statistics Yearbook* (Seoul, December 1974).

recourse loans and is required to buy rice used as security for the loans whenever the borrowers wish. This program was initiated as one of the measures to prevent a sharp decline in the price of rice at the harvest season. The loan rate ranged from 65 to 90 percent of the government purchase prices.

The program was considered quite successful in that it enabled farmers to borrow money on rice after harvest and redeem or sell later when the price was seasonally higher. Because of the increasing difficulties of securing loan funds from the Central Bank, the program was discontinued in 1968.

Farmland taxes in kind.—Farmers producing grain crops can pay their farmland tax in kind or in cash. The average rate of levy on an individual crop is about 6 percent of the crop. If the total output of a crop is less than 1.4 metric tons, no tax is levied. This exemption applies to about two-thirds of the farmers in Korea. As shown in Table 9, collection of rice under this program has been declining in recent years due to the increase in farmland tax payments made in cash.

Imports.—The quantities of foreign grain to be imported are determined in accordance with estimated overall demand and supply for a given year. Imports of rice and barley are handled directly by the government, whereas the imports of wheat and corn are handled partially by private importers. The prices, occa-

TABLE 9.—QUANTITY OF RICE COLLECTED IN PAYMENT OF THE
FARMLAND TAX, 1953-74*
(thousand metric tons of polished rice)

Crop year	Planned collection	Actual collection	Ratio of actual to planned collections (percent)
1953	216	212	98.2
1954	166	157	94.6
1955	157	132	84.1
1956	109	101	92.7
1957	139	111	79.9
1958	127	128	100.8
1959	131	128	97.7
1960	118	100	84.8
1961	—	—	—
1962	—	—	—
1963	—	—	—
1964	96	94	97.9
1965	89	89	100.0
1966	102	104	102.0
1967	76	64	84.2
1968	65	54	83.1
1969	76	63	82.9
1970	34	32	94.1
1971	33	34	103.0
1972	34	33	97.1
1973	37	41	110.8
1974	48	55	114.6

* Data from the Ministry of Agriculture and Fisheries, *Grain Statistics Yearbook* (Seoul, December 1974).

sionally even the marketing channels, of wheat and corn in private hands are determined by the government. The volume of grain imports during the past 20 years is shown in Table 10.

Evaluation of Recent Rice Policy

Due to the dominant role of rice in the Korean economy, rice policy is closely intertwined with various objectives and constraints in the overall development strategy. Although these objectives and constraints have never been systematically charted, the following six objectives have had direct relevance in the formulation of Korean rice policy:² reducing foreign exchange expenditures of food grain imports; minimizing the impact of rice prices on the general price level; improving urban-consumer welfare; increasing food grain (particularly rice) production, with the ultimate objective of self-sufficiency; upgrading farm incomes; and reducing government expenditures on grain operations.

² In a linear programming framework, objectives and constraints are two different concepts. From a policy point of view, however, factors can be classified as either objectives or constraints. For example, foreign exchange expenditure on food grain imports can be classified as an objective if the government attempts to reduce spending through policy intervention, or it can be treated as a constraint if the government imposes a certain limit within which a food grain program must be operated.

TABLE 10.—GRAIN IMPORTS, 1954-74*
(thousand metric tons)

Year	All grain	Rice	Ratio of rice to all grain
1954	180	14	7.8
1955	77	—	—
1956	427	4	0.9
1957	876	202	23.1
1958	868	23	2.7
1959	257	4	1.6
1960	468	—	—
1961	536	—	—
1962	499	—	—
1963	1,318	118	9.0
1964	916	—	—
1965	669	—	—
1966	525	32	6.1
1967	1,100	113	10.3
1968	1,497	216	14.4
1969	2,389	755	31.6
1970	2,115	541	25.6
1971	2,884	907	31.5
1972	3,211	584	18.2
1973	3,271	437	13.4
1974	2,732	206	7.5

* Data from the Ministry of Agriculture and Fisheries, *Grain Statistics Yearbook* (Seoul, December 1974).

Among these objectives, some are competing, while others are complementary. Therefore, policy makers are, in general, in a position to choose among several combinations of objectives.

Because Korea's investment strategy has centered on rapid industrial growth, general price stability has been one of the top policy objectives. For this reason, policy makers were particularly sensitive to the effects of rice policy on urban consumers' living costs and on inflation. But the objective of equitable distribution of income and self-sufficiency in rice received less attention than other aspects of the government's development program.

Because of the role of rice as a wage good, a rise in rice prices was believed to be one of the major causes of an increase in the general price level. The cost-push aspect of rice prices requires an extensive analysis of its spread effects on the prices of other commodities, which is beyond the scope of this paper. However, there is some evidence of the declining influence of rice prices on the cost of living of urban consumers. The proportion of expenditures on food items and on rice in total living costs, 57 and 31 percent, respectively, in 1965, declined to 41 and 17 percent in 1974. As per capita income grows, an increasing proportion of food expenditures can be expected to be devoted to meats, fish, vegetables, and processed foods. This effect implies that the influence of rice prices on prices of non-rice items will be weakened.

The low price policy for rice admittedly has had conflicting effects on the achievement of other objectives, especially on the desire to increase production of

TABLE 11.—SCALE OF GOVERNMENT OPERATIONS IN RICE MARKETS AND PRICE VARIATIONS*

Rice year	Production (<i>thousand metric tons</i>)	Government purchases (<i>thousand metric tons</i>)	Government sales (<i>thousand metric tons</i>)	Government market shares (<i>percent</i>)	Price variations (<i>percent</i>)	Month of lowest price	Month of highest price
1965	3,954	240	94	5.0	15.3	Nov.	Sep.
1966	3,501	302	217	12.3	25.3	Jan.	Sep.
1967	3,919	355	285	13.5	24.9	Dec.	Jul.
1968	3,603	286	442	18.4	20.1	Dec.	Oct.
1969	3,195	156	693	31.3	8.3	Dec.	Feb.
1970	4,090	326	749	29.6	5.5	Oct.	Dec.
1971	3,939	365	1,174	44.1	8.0	Nov.	Oct.
1972	3,998	507	1,114	46.3	6.7	Jan.	Mar.
1973	3,957	523	1,158	51.6	2.3	Nov.	Jul.

* Data from the Ministry of Agriculture and Fisheries, *Grain Statistics Yearbook* (Seoul, December 1974), and Bank of Korea, *Price Statistics Summary* (Seoul, December 1974).

rice and other cereals. At the same time, price policy stimulated rice consumption in the urban areas, resulting in a widening food gap. As long as a large portion of the food grain shortage was met in the past by local currency purchases under the PL 480 program, the food gap itself did not impose a serious burden on Korea's foreign exchange position. But after the change in U.S. policy to cash or dollar credit sales in the late 1960s, the food grain situation became directly related to the country's balance-of-payments position. The limited availability of foreign exchange for food grain imports has emerged as one of the most serious constraints in the formulation of food grain policy.

It is an accepted notion that foreign exchange plays an essential role in industrialization efforts of less developed countries by making it possible to import the capital, skills, and technology not available domestically. Considering the foreign exchange earning capacity and the magnitude of the foreign debt servicing obligations, expenditures of over U.S.\$400 million of foreign exchange on food grain imports cause further deterioration in an already weak balance-of-payments position. Hence, a policy designed to encourage industrialization may instead have a negative effect upon industrialization.

Efforts to protect urban consumer welfare and to stabilize prices at low levels will eventually create a more serious constraint. The two-price system for barley—higher prices for farmers and lower prices for urban consumers—was one of the policy choices aimed at reducing both consumption and imports of rice. As stated, evidence suggests that a change in the price relationship between rice and barley decreased rice consumption and increased barley consumption.

The implementation of a two-price system was not without conflict with another objective—minimization of government costs. The food budget deficit amounted to more than W127 billion (U.S.\$282 million) in 1974, and it is expected to increase further as the scale of government grain operations expands. Also, continuation of the two-price policy may have a small substitution effect on rice and barley unless the price difference between the two grains is eventually widened. As per capita incomes grow, the average consumer will respond less to changes in the relative price of barley because of a strong preference for rice.

Which objective should be given the highest priority depends upon the policy makers' preference which may be governed by the social, political, and economic situation. If the government decides to minimize foreign exchange expenditures on rice imports, the price of rice should be maintained at higher levels so that aggregate demand and supply is in balance with reduced imports. The higher price of rice will certainly contribute to increasing farm income as well as production in future years. Furthermore, the adverse effects of high rice prices on the objectives of general price stabilization and urban consumer welfare are no longer given as much weight as in the past.

Seasonal rice prices are no less important in Korean rice policy than the level of rice prices. Because seasonal stabilization of grain prices is viewed as having an anti-inflationary effect, major emphasis has been placed upon dampening seasonal rises in rice prices. As shown in Table 11, when the government did not have sufficient stocks of rice, the rate of seasonal variations in rice prices ranged from 15 to 25 percent. But with the increased market share of government-controlled rice, seasonal price fluctuations have been substantially dampened, and the range has been reduced to 2 to 8 percent in recent years.

Such a low rate of seasonal variation in market prices is not consistent with the costs of holding rice, resulting in little or no incentive for farmers or traders to hold their rice for later sales. This price relationship serves to discourage investment in storage facilities and to stimulate rice consumption in both rural and urban areas, which is contradictory to other objectives.

The government customarily uses the change in a wholesale price index to measure price stability. A rise in the price of rice is automatically reflected in this index via its weight of 9 percent. If the price of rice rises to its seasonal peak, say 15 percent, the wholesale price index automatically rises about 1.4 percent, other prices remaining unchanged. This rise in the wholesale price index is often viewed as inflationary by policy makers. But the seasonal pricing policy *per se* should not be viewed in terms of stabilization objectives. A seasonally adjusted price index should be used as a stabilization indicator.

The use of a uniform purchase price throughout the rice acquisition period, usually from November through January, is also subject to criticism. If the government plans to expand its scale of grain operations, it is possible to improve the acquisition program by adopting a differential pricing system for varying months, the difference being large enough to cover the storage costs of farmers.

If the government were to raise the purchase price of rice later in the year, farmers would have an incentive to hold their grain and to distribute their sales more evenly. In addition, there is no particular reason why the purchase program should be limited to the months November through January. Extending the purchase period until March or April would alleviate budgetary constraints because the government would not require all rice acquisition funds in such a short period of time. Moreover, fluctuations of purchasing power in rural areas would also be reduced.

SUMMARY

Because of a strong tendency among Korean policy makers to identify economic growth with industrialization, the agriculture sector received insufficient resources during the 1960s. This industry-oriented policy achieved almost a 10 percent annual average growth rate of GNP during the 1961-71 period, contributed to modernizing the Korean economy, and increased job opportunities in the non-farm sector. A considerable number of people moved from rural areas to urban industrial areas to take advantage of better employment and income opportunities.

However, increasing pressure upon the balance of payments, due to the growing food deficit, and widening income disparity between urban and rural households began to make policy makers realize that industrialization and agricultural growth are not independent of each other. In particular, the recent experience of world food shortages and soaring grain prices in the world market has led the Korean government to shift emphasis in its development strategy toward agriculture.

The expression "self-sufficiency in staple food" is used with increasing frequency in the government documents. Self-sufficiency in rice and barley, in particular, is listed as a priority target. Government price support programs were

strengthened with a view to stimulating domestic production, but they have not yet accelerated growth in food grain production to the self-sufficiency level. Consequently, as an alternative way of balancing demand and domestic supply of rice, the government induced a shift in the consumption pattern from rice to barley through changes in the relative prices of the two grains. The two-price system for barley combined with various rice-saving measures were put into effect, resulting in a decrease in rice consumption and an increase in barley consumption. The barley gap was met by importation, since imported barley was much less expensive than imported rice. As noted earlier, however, the attempt to substitute barley for rice through changes in relative prices is destined to weaken as per capita income grows because of the strong preference for rice in Korea. The effort to conserve rice through price policy and other administrative measures cannot, therefore, be pursued as a long-run policy.

The only way to achieve self-sufficiency in the long run is to increase domestic production so that at least the national minimum requirement is met from domestic sources. But in view of the limited opportunities for expanding total paddy area, the country must rely heavily on higher yields per unit area to expand rice production. The fact that rice and barley yields in Korea are on the average 15 percent lower than in Japan suggests that there is potential for achieving yield increases by applying improved technology and building up the production base.

In Korea more than two-thirds of total paddy area is partially irrigated or dependent upon rainfed water. Moreover, much paddy land is poorly drained and lacks adequate flood control structures. The achievement of higher yields thus depends upon improvement of irrigation, drainage and flood control facilities. The recent development of the new rice variety IR 667 has opened up new possibilities for increasing rice yields. Increased double-cropping of paddy land offers another potential source of additional food grain production, particularly of barley and non-rice crops. The increased supply of agricultural inputs, especially fertilizer and chemicals, is another essential factor for expanding food grain production. All these efforts require greater investment in the agricultural sector and provision of incentive prices for farm producers. The extent to which policy makers in Korea move in this direction depends upon how fully they realize that a lagging agriculture—especially in food production—may eventually jeopardize industrialization and growth of the economy as a whole.

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