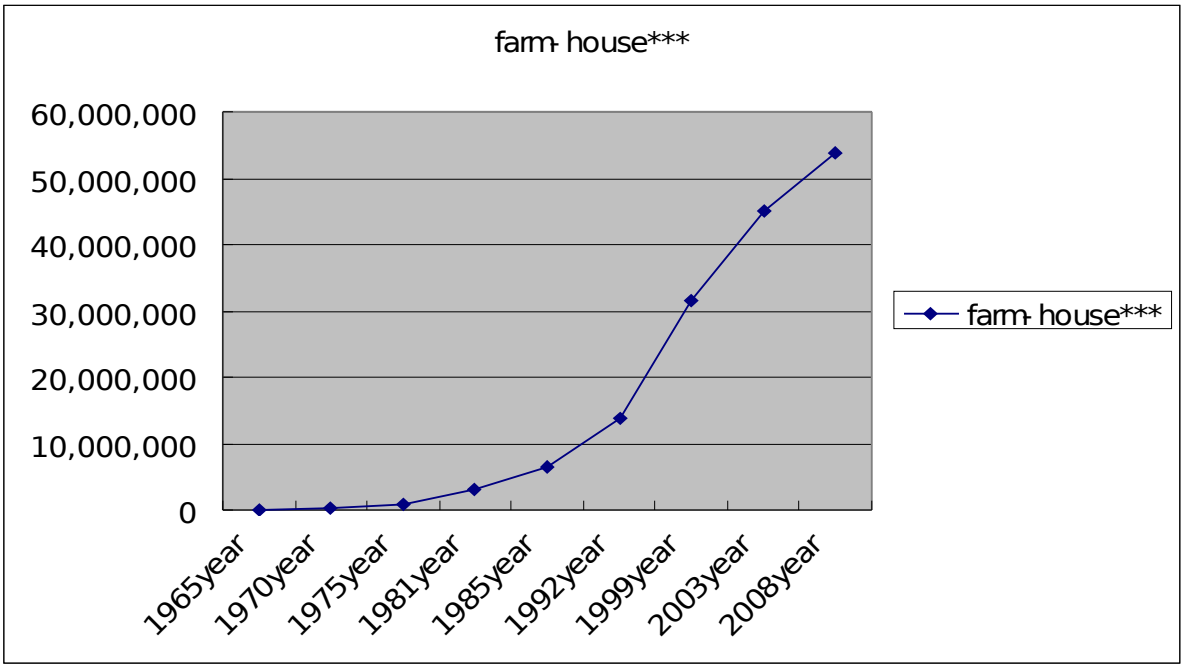
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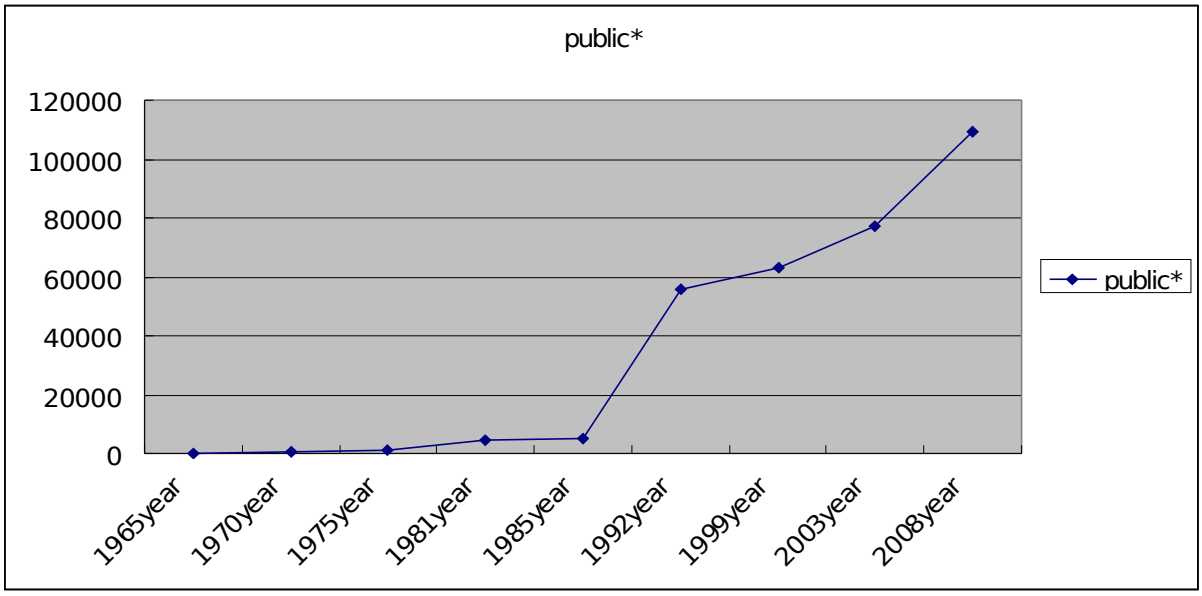
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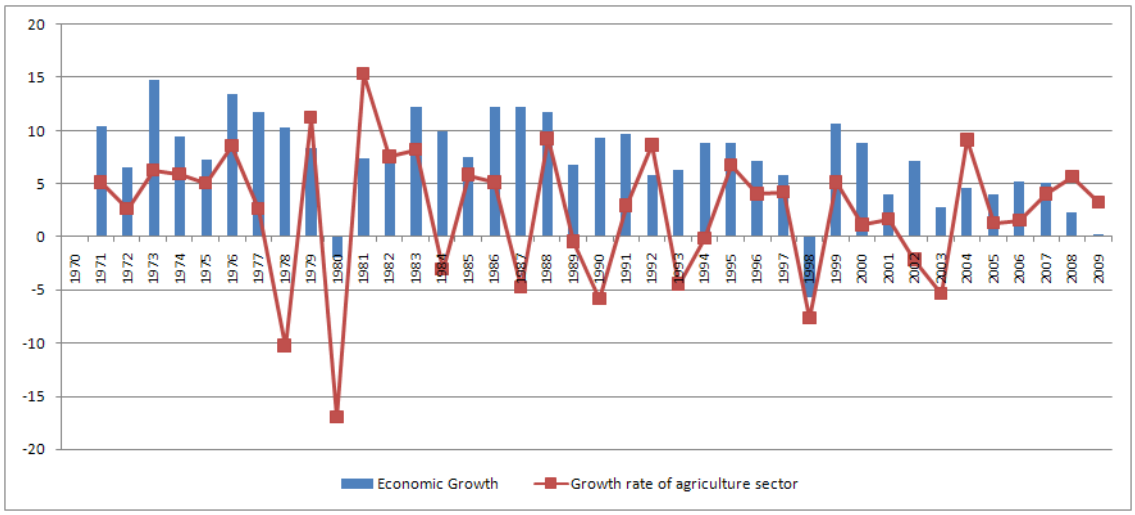
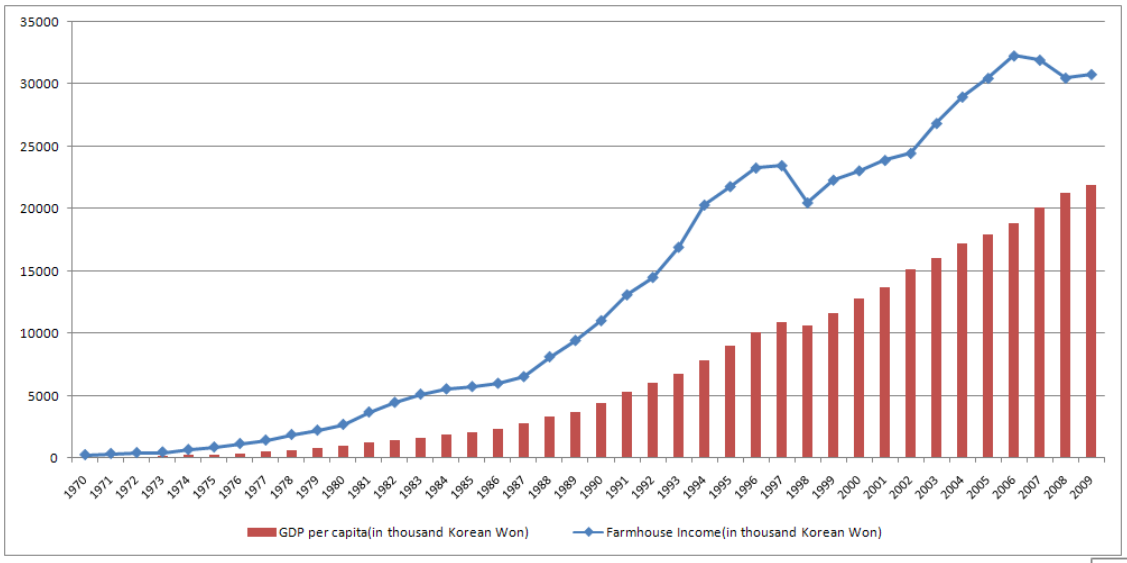
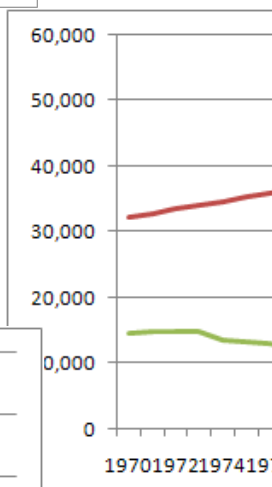
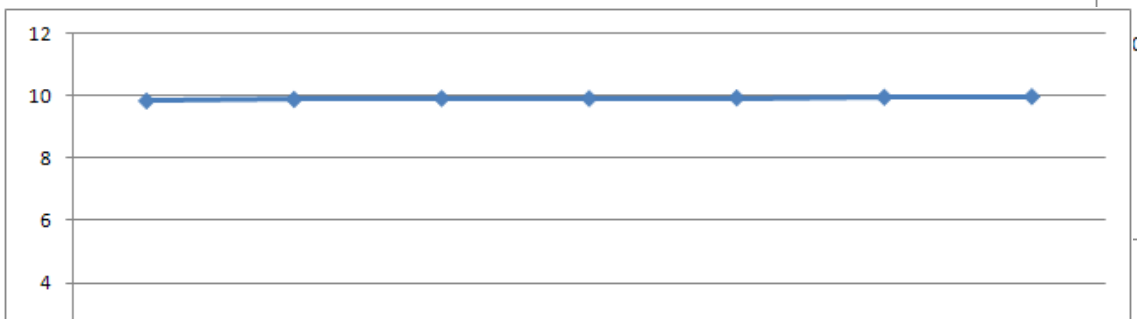
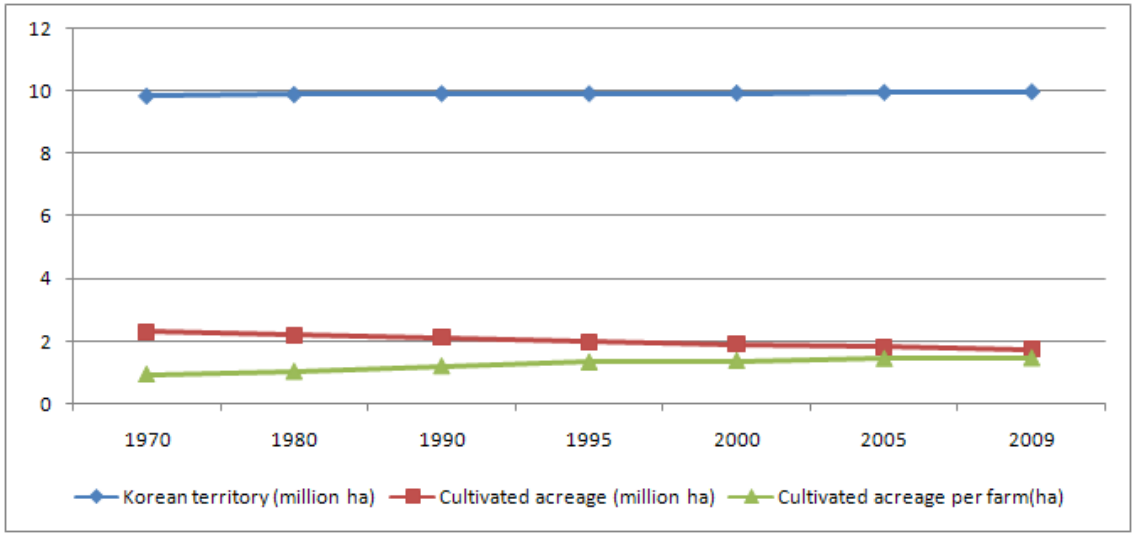

Economic Growth
Growth rate of agriculture sector


GDP per capita(in thousand Korean Won)
Farmhouse Income(in thousand Korean Won)







Country Case Study Investigating Supportive Policies and Resource Allocations for Agriculture Investment

2011. 10.

Global Agriculture Policy Institute

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I. Introduction

Since the recent financial crisis beginning in the U.S., the world economy has slowed, greatly affecting the agricultural sector. The surge of food prices in 2008 challenged and threatened the world, especially countries with economic weaknesses, and raised a serious question about whether the world agriculture market could supply enough food at an appropriate price in the future. Although food prices declined afterwards, bad weather in various parts of the world made prices increase again, a result that seriously effected the food security of the world, especially in many developing countries.

The sudden price jump of agricultural products and the abnormal weather conditions resulted in an increase in all commodity prices. Thus, the mutually

dependent countries in the world economy need to find new alternatives. The high prices in the world agriculture market signal that more resources need to be invested and more agriculture products should be produced and that agricultural policy reforms and additional agricultural investments are needed in most parts of the world, especially in many developing countries.

For many less developed countries (LDCs), difficulties in continuing their economic development are expected to last for quite a long time because of the structural problems in their agriculture sector. These problems have caused many to project that any increase in agricultural production will still fall short of agricultural demand.

Under these circumstances, it is widely recognized that more research should be conducted to improve the structural conditions in the agricultural sectors of many developing countries. Before agriculture can develop further and before developing countries can increase the production of food, more research is needed. This research needs to analyze mid-term and long-term policies and to search for new policy alternatives via Country Case Studies.

This paper presents a case study of the agriculture policies and their implementations in Korea. This country experienced the successful transition from an agricultural nation to an industrial one. This paper examines periodic changes in agricultural circumstances, investment supporting programs of agriculture and their policy implications, and analytical results of mid-term and long-term supporting policies. From this case study, we discover policy implications and solutions which can be of help in planning and implementing agricultural policies in developing countries and in the LDCs that are trying to improve their agriculture structure.

The following is expected from this research. An investigation of the changes of development procedures and the policies in Korean agriculture will suggest the effective alternatives of investment and capital accumulation in agriculture. It will analyze the trend of Korean agricultural investment for the last 30 years, compare it by sectors - public, private, and farm household - and suggest policy

implications. It will also suggest the selection of efficient policies for agricultural growth in developing countries and LDCs and suggest the development model of agricultural investment for long-term growth and sustainable development.

II. An Outlook on the Korean Economy and Agriculture

1. An Outlook on the Korean Economy

1) Development Procedure of the Korean Economy

The Korean economy has achieved a high growth rate due to export expansion and an open economic policy. In summary, since the 1960s, the Korean economy has grown due to the government implementing export oriented policies, emphasizing heavy industry development and favoring the industrial policies of conglomerates.

From the beginning of the Economic Development Plan in the 1960s, the Korean economy has chosen not a strategy of developing manufacturing industries for the domestic market as Brazil or Argentina has done, but one of developing manufacturing industries for exporting products to markets abroad. Export expansion to markets abroad was considered essential for achieving governmental control of economic development. At the initial stage of economic development, the focus was on exporting light industrial products. In the 1970s, the emphasis was on heavy industry. Most of the foreign investment and fiscal investment were used for developing heavy industry. This industrial policy was not for small and medium size firms but for conglomerates.

Korean economic development can be summarized as follows:

(1) 1953 – early 1960s : period of substituting imports mainly in light industries

(2) Early 1960s – early 1970s : period of promoting exports mainly in light industries

(3) 1970s : period of developing heavy and chemical industries

(4) 1980s – 1994 : period of adjusting to economic openness and liberalization

(5) After 1995 : period of globalization and the WTO

(1) Period of substituting imports mainly in light industries(1953 – early 1960s)

After the Korean War, Korea suffered from political instability, a deficiency of necessary commodities, a rapid increase in population, absolute food shortages, an unstable market system, and the threat of inflation. During this period, industrial development from foreign aid mainly focused on basic intermediate production goods such as fertilizer, cement and non-durable consumer goods, especially the so-called three white industries – cotton, wheat, and sugar. In order to control imports, Korea implemented a trade policy of high tariff rates and tariff quotas. The industrial policy was too dependent on foreign aid, and Korea's market became a major market for surplus American agricultural products.

(2) Period of promoting exports mainly in light industries(early 1960s – early 1970s)

Entering the 1960s, the international system of industrial specialization changed. Before the 1970s, a developed country relied on manufacturing and a developing country relied on agriculture; in the 1970s, a developed country relied on heavy and chemical industries and a developing country relied on light industries. The financial assistance from developed countries to developing ones also changed. Instead of aid, they provided loans. During this period, the new Korean government recognized the importance of economic growth, so its new policies pushed the development of export-oriented processing and assembling industries heavily dependent on foreign loans.

The Korean government imported the surplus agricultural products of the U.S. to stabilize the general price level and to protect the basic living conditions of urban people. This policy, however, in the long run resulted in the weakening of its agricultural production base. Various favorable policies for export industries were implemented such as tax exemptions, financial and institutional support and export subsidies. Due to this economic development plan, the size of the economy increased greatly. Social Overhead Capital (SOC) expanded and the production and export of light industrial products such as textiles rapidly increased. In the early 1970s, there were more secondary industries than primary industries, and tertiary industries outnumbered both secondary industries and primary industries respectively.

(3) Period of developing heavy and chemical industries(1970s)

In the world market, the status of the U.S. became weaker in the late 1960s. Thus, President Nixon announced his “emergent economic remedies” – the suspension of the gold convertibility of the dollar, a ten-percent reduction in foreign aid, and the implementation of an import duty of 10%. The new protectionism of developed countries became stronger. This development hurt the exports of the developing countries’ labor intensive light industry. Around 1970, developed countries, in the midst of becoming post-industrial societies, compelled labor intensive heavy industries to relocate to developing countries.

During this period, the Korean economy exported more light industrial products, but this resulted in increased pressure on its heavy and chemical industries with regards to materials and produced goods . In the early 1970s, the surplus labor from the agriculture sector dried up, weakening the export capability of labor intensive manufactured goods. In January 1971, the Korean government announced a new policy of fostering heavy and chemical industries. It selected 6 strategic sectors – steel, non-steel metals, petro-chemicals, machinery, shipbuilding, and automobiles. Tax deductions, export incentives, and financial benefits were given to those sectors. Because of the policy focussing intensely

on fostering heavy and chemical industries, Korea suffered from negative effects including distortions in resource distribution, the hardening of dual structures among industries, the deepening of structural disequilibrium between conglomerates and small and medium-sized firms, the inefficiency of redundancies and over-investment, and the convergence in production facility ownership by the conglomerates. But considering the situation of the Korean economy in the 1970s, this economic policy was evaluated as an appropriate one for the country to change from one relying on light industries to one utilizing heavy and chemical industries.

(4) Period of adjusting to economic openness and liberalization(1980s – 1994)

The oil shocks of 1974 and 1979 resulted in weakening the international competitive power of the Korean economy in export markets. This was due to various reasons such as the world economic recession, the new era of protectionism collapsing the world trade order, a surge of exports from newly developing countries, and the huge fiscal and trade deficits of the U.S., the world's biggest market. Korean over-investment in heavy and chemical industries in the 1970s resulted in an economic recession and a foreign exchange crisis in the early 1980s. This gave a pessimistic outlook for the Korean economy. Fortunately, “The Three-Low Phenomena” (low interest rates, a low foreign exchange rate, and low oil prices) helped Korean exports increase again. By the late 1980s, Korea enjoyed a trade surplus for the first time in its history.

After the mid-1980s, the Korean government chose an industry-neutral policy, so it reduced its involvement in the financial market, privatized some financial institutions, began to decrease fiscal financing, and began to expand import liberalization. The new government of this period launched a new economic paradigm for the creation of a new Korea, a Korea which pursued an economic policy based on the participation and creativity of its citizens, instead of one with the government both leading and controlling the economy.

(5) Period of globalization and the WTO(after 1995)

The establishment of the WTO set a new world trade order. The exchange of most manufactured products became free-trade, and only a few products were subject to low tariff rates. The trade of agricultural products became subject to the WTO rules and regulations. Non-tariff barriers were allowed in very limited areas. The WTO controls of trade related services and intellectual properties and international investment became freer as well. In 1996, Korea became a member of the OECD, which meant more liberalization was on the way in every field of the Korean economy. After the foreign exchange crisis of 1997, only a few sectors of the Korean economy were not liberalized. The Korean government sought to restructure the overall economy aggressively. With the world economy in recession recently, the Korean economy abolished the economic management practice from its period of industrialization and followed a path that would achieve simultaneously market competition, economic democratization, growth, and distribution. Today, the Korean economy is no longer led by the government but by private companies. It is very difficult to find a significant industrial policy being implemented by the Korean government.

2) Status Changes of Korean Economy in the World

<Table 1> shows the territory and population of South Korea and other major countries in the world. According to the table, the territory of Korea is only 99,720km^2, a size equivalent to 0.58% of Russia, 1% of Canada, 1.1% of U.S.A., and 26% of Japan. It is the one hundred-eighth largest country in the world. By 2010, the total population of Korea was 48.51million, a 1.9 fold increase since 1960. It has 3.6% of the population of China, 15.8% of the U.S.A., and 38.2% of Japan. Korea has the twenty-fifth largest population in the world.

<Table 1> Territory and population of major countries and Korea (as of 2010)

Rank	Territory(in km^2)		순위	Population(in Person)	
1	Russia	17,098,242	1	China	1,338,612,968
2	Canada	9,984,670	2	India	1,156,897,766

3	USA	9,826,675	3	USA	307,212,123
4	China	9,596,961	4	Indonesia	240,271,522
5	Brazil	8,514,877	5	Brazil	198,739,269
6	Australia	7,741,220	6	Pakistan	174,578,558
7	India	3,287,263	7	Bangladesh	156,050,883
8	Argentina	2,780,400	8	Nigeria	149,229,090
9	Kazakhstan	2,724,900	9	Russia	140,041,247
10	Sudan	2,505,813	10	Japan	127,078,679
108	Korea	99,720	25	Korea	48,508,972

Source : www.korea.go.kr

<Table 2> shows the GDP and per capita GDP of major countries and Korea. The economy of Korea (GNP) was $2.3 billion in 1962 – the start of the Economic Development Plan; $8.1 billion in 1970 (making Korea the thirty-third largest economy in the world); $64.3 billion in 1980; $270.3 billion in 1990; $533.5 billion in 2000; and $986.3 billion in 2010 (fifteenth largest in the world). The GNP per capita was $87 in 1962, $252 in 1970, $1,592 in 1980, $6,498 in 1991, and $20,165 in 2010.

<Table 2> GDP and GDP per capita of major countries and Korea (as of 2010)

Rank	GDP(in ten million US$)		Rank	GDP per capita(in US$)	
1	USA	1,462,418	1	Luxemburg	104,390
2	China	574,513	2	Norway	84,543
3	Japan	539,090	3	Qatar	74,423
4	Germany	330,590	4	Swiss	67,074
5	France	255,544	5	Denmark	55,113
6	UK	225,857	6	Australia	54,869
7	Italy	203,669	7	Sweden	47,667
8	Brazil	202,353	8	UAE	47,407
9	Canada	156,366	9	USA	47,132
10	Russia	147,691	10	Netherland	46,418
15	Korea	98,626	33	Korea	20,165

Source : www.korea.go.kr

<Table 3> shows that annual growth rate of major countries and Korea. The annual economic growth rate of Korea has been higher than that of most developed countries. The annual growth rate of Korean economy was 10.4% in

1971, 7.4% in 1981, 9.3% in 1990, 8.8% in 2000, and 6.2% in 2010. Although its growth decreased in the late 2000s, it remains much higher than the economic growth rates of the U.S.A., Japan, the U.K. or other Euro countries.

<Table 3> Annual growth rate of major countries and Korea (in %)

구분	Korea	USA	Japan	China	UK	Euro Zone	Germany	Taiwan
1971	10.4	3.4			2.0		3.1	12.5
1981	7.4	2.5	4.2		-1.5		0.5	6.5
1990	9.3	1.9	5.6	3.8	0.8		5.3	6.9
2000	8.8	4.1	2.9	8.4	3.9	3.9	3.2	5.8
2010	6.2	2.9	3.9	10.3	1.3	1.8	3.6	10.9

Source : www.bok.or.kr

In terms of the industrial structures in Korea, the proportion of agriculture, forestry and fisheries was bigger than that of mining and manufacturing in the early 1970s. As industrialization continued, the former had become smaller than the latter by 1973. The proportion of agriculture, forestry and fisheries continued to decline: 25% in 1975, 12.8% in 1980 and 8.1% in 1991. The proportion of mining and manufacturing changed from 27.5% in 1975 to 27.9% in 1991, and the proportion of construction increased from 4.8% in 1975 to 15.4% in 1991, a percentage close to the industrial structure of developed countries.

The trade volume of Korea since 1962 has increased substantially. It was $0.5 billion in 1962, but increased to $153.4 billion by 1991 – a 307 fold increase. By 2010, trade volume was $891.6 billion – a 1,783 fold increase from 1962 – making Korea the twelfth largest trader in the world. Its export volume was $55 million in 1962, and increased 1,307 fold to $71.9 billion by 1991. By 2010, it was $466.4 billion, an 8,480 fold increase from 1962. The import volume was $422 million in 1962 and by 1991 increased to $81.5 billion, a 194 fold increase, and to $425.2 billion by 2010, a 1,008 fold increase from 1962. The trade balance (the difference between the amounts imported and exported) had been a growing deficit until 1980. From 1980 until 1985, the trade deficit decreased. Korea achieved a trade surplus for the first time in 1986, and it continued for

four years. Its $3.4 billion surplus in 1986 was achieved due to “The Three-Low Economic Boom" (resulting from low oil prices, low interest rates, and low won value). From 1990 until 1997, the year of the foreign exchange crisis, Korea again had a trade deficit. Since the foreign exchange crisis, the Korean economy has kept a trade surplus. The trade surplus in 2010 was $41.9 billion.

<Table 4> Trade balances of Korean economy by year (in thou. $)

year	balance	year	balance	year	balance	year	balance
1980	-6,007.2	1988	11,172.4	1996	-15,461.5	2004	39,660.5
1981	-5,199.6	1989	3,922.6	1997	-3,860.8	2005	32,856.9
1982	-4,700.2	1990	-2,297.7	1998	43,236.9	2006	31,433.4
1983	-3,516.9	1991	-6,447.9	1999	27,892.7	2007	37,129.1
1984	-1,807.9	1992	-411.8	2000	18,655.7	2008	5,170.1
1985	-1,692.6	1993	3,731.2	2001	13,029.2	2009	37,866.0
1986	3,413.1	1994	-3,114.0	2002	15,203.2	2010	41,904.0
1987	7,204.7	1995	-4,420.1	2003	24,027.9		

Source : www.bok.or.kr

During the economic development of Korea, the Korean government invested in and fostered heavy and chemical industries, which resulted in Korea achieving global competitiveness in sectors such as shipbuilding, steel and cement production, and automobiles.

2. An Outlook of Korean Agriculture

1) Development Procedure of Korean Agriculture

The development of Korean agriculture could be periodically classified by changes in economic circumstances and policies or by changes in the agricultural structure. In this research, the development of Korean agriculture was classified into four periods based on government policies. First, the period from 1945 until 1960 is called the period of pre-industrialization; the second, from 1961 to 1976, is known as the period of rapid economic growth; the third,

from 1977 to 1988, the period of stable economic growth; and the fourth, from 1989 until the present, the period of trade liberalization.

(1) Period of pre-industrialization (1945 - 1960)

Although the Korean agricultural sector dominated the economy in 1945, it had several negative characteristics: most of the farmland was owned by landlords using the small-size tenant farming system, the agricultural production base was weak, agricultural materials were deficient, production was low, and the production system produced few crops. This resulted in the farm household economy suffering from a chronic deficit. Before launching the economic development plan in the 1960s, Korea was one of the LDCs and agriculture was absolutely the most important industry in its economy.

During this period, the GDP grew annually at a rate of 4.5%, and the GNP of agriculture, forestry and fisheries grew by 0.8%. Although the proportion of the rural population to the total population decreased from 72% to 58%, the ratio of employment in agriculture, forestry and fisheries was 79% in 1953, 78% in 1956 and 80% in 1960. The society was a pre-industrial agricultural one and was in the process of accumulating capital for industrialization. Above all, its major task was to solve the problem of urgent food shortages.

The main goal of the agricultural policy was to solve the food shortage problem and to settle on a new landlord-tenant system on the farms. In order to solve food shortages the government implemented a grain purchasing system, relied on America’s assistance of surplus agricultural products through the PL 480 from 1956, and implemented the Food Production Increase Plan. The Farmland Revolution of 1950 changed tenant farmers to landed farmers, but the Food Production Increase Plan was not successful.

The Farmland Revolution was a keynote among the changes in Korean agriculture in the rural area in 1950s. The first Constitution of July 17, 1948 states "farmland shall be distributed to farmers, and the way of distribution, area limits and details of ownership shall be determined by law." The Korean

government proclaimed 'The Farmland Revolution Law' on June 21, 1949, and the revolution was implemented as the 'Amended Farmland Revolution Law' proclaimed on March 10, 1950.

The basic idea of the farmland revolution was that the government would purchase at reasonable prices farmland owned by non-farmers, farmland not cultivated by its owner, and farms over 3 hectares cultivated by its owners; then the government would distribute that farmland to tenant farmers and farmers with too little farmland compared to their cultivation potential; finally, the farmers would pay back to the government but enjoy generous terms. The goal of the farmland revolution was "distributing farmland to farmers appropriately", which would improve agricultural productivity and the rural economy via the establishment of the self-farming system. And it was also expected that the former landowners would become capitalists or the former farmland capitalists would become industrial capitalists.

As most of the previous tenant farmers became self-cultivating farmers due to the farmland revolution, they were more motivated than before. Part of the financial fund created by the revolution was invested to enlarge farm irrigation so as to improve the foundation of agricultural production, which brought in the development of agricultural productivity and the increase of the food supply. Because of excessive imports of surplus agricultural products from the U.S., the exploitation of the farmland tax, and the prevailing usurious loans in rural areas, the farmland revolution could not be realized in the 1950s. Its effects were progressively realized during the 1960s.

The amount of land cultivated in Korea was 2,320 thousand hectares. In 1945, 1,470 thousand hectares (64.2%) were used for tenant farming. The amount of highly productive paddy land was 1,280 thousand hectares. 890 thousand hectares (71.2%) of that land was used for tenant farming. Among the 2,060 thousand farm households at the end of 1945, 48.9% were pure tenant farm households, 34.6% were part-tenant & part-land owning ones or small land owning ones, and only 284 thousand farm households (13.8%) were land owning

farm households (including landlords). <Table 5> shows the changes in farm household proportions by the types of farmland ownership before and after the farmland revolution. The proportion of the land owning farm households was 13.8% in 1945 and was 71.6% in 1964, an increase of 57.8%. Comparing the agricultural production foundations under Japanese rule between 1930-34 and the period of 1960-64 after the revolution, the cultivated area increased by 170 thousand hectares (about 10%) from 1,710 thousand hectares to 1,880 thousand hectares, the proportion of the non-irrigated paddy land decreased from 34.3% to 19.4%, and the number of farm household increased from 2,040 thousand to 2,400 thousand. (The average cultivated area per household decreased from 1.17 hectare to 0.87 hectare.)

<Table 5> Changes in farm household proportions by the type of farmland ownership

(in %)

	1945	1947	1964
self owning	13.8	16.5	71.6
part-tenant & -owing	16.4	38.3	14.8
small self owning	18.2	-	8.4
pure tenant	48.9	42.1	5.2
non-cultivating	2.7	3.1	-
total	100.0	100.0	100.0

Source : Ki-hyuk Pak, et.al., A study of Land Tenure system in Korea, 1966 (requoted from Doobong Han . Byungryl Kim, 「Direction of the Korean Agriculture Development toward 21st Century
, Korea Rural Development Institute, 1992. p.213)

From 1956 to 1964, America assisted by supplying Korea with its surplus agricultural products, accounting for between 5% and 23% of the total domestic grain production of Korea, and thus helped to solve the problem of food shortages. However, the assistance made the domestic price of agricultural products lower, and resulted in the Schere Phenomenon (prices diverge between agricultural products and manufacturing ones) and in weakening the rural economy. Agriculture of this period did not fulfill the basic role of supplying

enough food, so the idea of supplying land, labor and capital for industrialization could not even be considered. One significant impact of this period's agricultural policy was the disappearance of landlords and the establishment of landed farmers due to the Farmland Revolution, which became the basis for emerging industrial capitalists and laborers.

(2) Period of rapid economic growth (1961 - 1976)

The Korean economy accomplished significant success through the 5-year economic development plans from 1961 to 1976. For these 15 years, GNP increased from $2 billion in 1961 to $25 billion in 1976, an annual rate of 9.5%, and the agricultural sector grew at an annual rate of 4.9%. The proportion of agricultural GNP to the total GNP decreased from 40.2% in 1961 to 24.8% in 1976, while the rate of employment in the agricultural sector decreased from 63.1% in 1963 to 44.6% in 1976. Both farming households and the rural population began to decrease from 1968, and the amount of cultivated land began to decrease from 1969.

This industrialization, mainly dependent on foreign capital, caused a massive movement of land and labor from rural agricultural areas to urban industrial areas. The task of the agricultural policies was maintaining and developing the landed farming system during this period of urbanization and industrialization, and the goal was to increase food production and to modernize its production processes. The main instruments for increasing food production were the development and spread of new technologies, a rural leadership project, the construction and readjustment of arable land, the improvement of seeds, and increased farm mechanization. Rural development policies included the installation of electrical power and the expansion of roads. Rural income policies included a 'special project for increasing farming and fishing incomes' and a price support policy for grain.

Entering the 1960s Korea did suffer from political and social disorders, but still began its economic development plan in order to achieve rapid economic growth

and to overcome its label as a LDC economy. The principle objective of the economic development plan was to construct the economic foundations, so the import substitute manufacturing industry and export oriented light-industry were heavily fostered. The objective of its agricultural policy was to increase food production and to erect a foundation of agricultural production. The government made the 'agricultural product price stabilization law' in order to compensate farm household incomes and to increase food production, and made the 'rural usurious loans clearing law' in order to eliminate the usurious loans prevailing in rural areas. Even though more than 90% of farm households became self-owning farm households through the farmland revolution of 1950, agricultural production did not increase as expected. The low agricultural product prices due to the massive import of surplus agricultural products from the U.S. made the rural economy chronically deficit, and a poor institutional financing system made most farm households dependent on usurious loans with interest rates surpassing 50%.

The first 5-year economic development plan (1962-1966) was the first composite economic development plan in Korean history. The major goals for the agricultural sector were an 'agricultural output increase' and the 'modernization of production process'. These policies were intented to increase the grain production, thus raising both the food self-sufficiency ratio and the agricultural products needed for manufacturing and for export. The output increase plan was prepared for the three sub-sectors of grain, horticulture, and special crops, but the main target was to increase grain production. To that end, the enlargement of cultivated land and the enhancement of unit-area productivity were adopted as major policy instruments. The government put efforts on expanding cultivated land to increase grain production and on constructing and readjusting arable land and improving farmland productivity through arranging related regulations and systems. As a result, the rural economy - even the lowest income class of farms showed statistical surpluses - became significantly stabilized compared with the 1950s, but the absolute income level was still low.

Along with the simultaneous development of agriculture and manufacturing, the agricultural policy during the second 5-year economic development plan (1967-1971) is credited with increasing farm household incomes, for modernizing agriculture, and for increasing food self-sufficiency through production enhancement. Since production enhancement alone was not enough for increasing farm household incomes, various measures such as construction and the readjustment of arable land, massive irrigation projects, improvement of seeds, farmland productivity enhancement, countermeasures for natural disaster, and farm mechanization were implemented to increase food production. The simultaneous development project of agriculture and manufacturing was to process locally produced agricultural products and to sell those products to either domestic or foreign markets. This plan would develop the manufacturing industry as well as increase farmers' incomes by providing the raw materials. The Rural Development Corporation was established to develop and foster the processing and storing of agricultural products. Thus, the special project for increasing rural income was launched. During this period the annual growth rate of GNP was 11.4%, and the proportion of the primary industries decreased from 37.9% in 1966 to 21.4% in 1971, while secondary industries increased from 19.8% to 29.9% and tertiary industries from 42.3% to 45.9% respectively. Stagnant growth in the primary industries and the dominance of the tertiary industries resulted in an imbalance in the sectors of the national economy.

Although the Korean economy experienced significant growth during the first and second 5-year economic development plans, many structural problems emerged: the increased imbalance between urban and rural areas and among industries and regions; the concentration of the population in metro areas; an excessive dependency on foreign investment funds; the decline in the food self-sufficiency ratio; and a surge in the trade deficit. The third 5-year economic development plan, then, was set to achieve 'harmonization among growth, stability and balance', 'a take-off into a self-reliant economic system', and 'balanced development among regions'. The main objectives were a

revolutionary development of the rural economy, an epochal enhancement of exports, and the fostering of heavy and chemical industries. The primary goal of the agricultural policy was the increase of food production, especially focusing on self-sufficiency of staple grains. Thus, the Korean government put efforts on constructing agricultural production foundations such as the development of irrigation water, a large scale agricultural complex development project, the readjustment of arable land and improvement of irrigation, and the conservation and expansion of arable land. The farm mechanization project, the development and diffusion of high yield rice (Tong-il), and the price supporting policy of agricultural products were implemented as well. As a special project for enhancing rural income, an increase in the production of economic crops, livestock, and the silk-reeling industry were pursued. During the 1970s, the 'Saemaeul' movement, based on mutual reliance, diligence and cooperation, was enthusiastically implemented, and its fever prevailed throughout the rural area.

The Saemaeul movement was a kind of national movement that prevailed in rural areas during the 1970s. In April 1970, a project called 'managing new villages movement' began in rural areas as a countermeasure to drought and as a means of rural movement based on mutual help and self-reliance. The goals of the movement were spiritual enhancement, environmental improvement, and an increase in incomes. The Saemaeul movement began with the question "how to make rural areas more comfortable for living", set its direction in 1970, launched a 'managing new villages movement' in 1971, upgraded and upscaled itself to the Saemaeul movement in 1972, insured its sustainability in 1973, set steps for the development of basic villages, mutual help villages and self reliant villages in 1974, and deepened and expanded its base from 1977 to 1981. Roofs and walls of rural houses were reformed and improved, and roads both inside and outside the villages were widened and paved. Thus, the Saemaeul movement triggered the farmers' spirit for living well, reformed the conditions in rural areas, and contributed to increasing rural incomes. The ideology of the Saemaeul movement was 'making a community of cooperative living', enhancing

agricultural competitiveness in a short period, reclaiming self-confidence, and promoting community spirit and participation through it's the voluntary participation of its citizens. The Saemaeul movement became a power-house of modernization of the whole Korean society and was positively evaluated as a successful model of rural development in the world.

In 1955, rice production in Korea was more than 288 million M/T, but there had been little change afterwards. No significant increase in rice production was expected with the Japonica variety of rice in use, so a new variety of rice which is resistant to disease began to be fostered in the late 1960s. The new variety was obtained through cross-breeding the Japonica variety with the Indica one. After many steps of hybridization and various tests about its productivity and local adoptability, a new variety of rice named 'Tongil' was widely diffused in 1971.

At first, farmers resisted plainting 'Tongil' rice, because it required complicated cultivating technology such as a heat-conserved rice seedbed, early planting, time-sensitive fertilization, control of insects and pests, and more irrigation control than the traditional variety did. However 'Tongil' rice was rapidly popularized owing both to the government's purchasing of and price supporting policy for 'Tongil' rice and to the development of cultivating technology. The area cultivated with 'Tongil' rice was 187 thousand hectares in 1972, and it increased to 533 thousand hectares in 1976. Output per 10 acres of the 'Tongil' variety was 386 kg, while that of the traditional variety was 329kg in 1972. In 1976, the 'Tongil' was 479kg, which was 21% more than the 396 kg of the traditional variety. 'Tongil' rice production significantly increased and contributed to helping Korea obtain staple grain self-sufficiency. The 'Green revolution' was also achieved by 'Tongil' rice, because the application of a new cultivating technology developed for the 'Tongil' variety rather than the traditional one contributed to an increase in output as well.

The spread of a new variety of high yielding rice (Tong-il) from 1971 made Korea self-sufficient in producing its staple grain, and the ‘Saemaeul’ movement ignited fundamental rural development from 1970. During this period, farm income

increased due to jumps in production and price supporting policies of rice, and the economy of the farm household stabilized. The ‘Saemaeul’ movement changed rural living conditions and the farmers’ attitudes about economic conditions. However, the structure of the small landed farming system remained unchanged and the letting and hiring of farmland began to spread widely.

(3) Period of stable economic growth (1977 – 1988)

In spite of the energy and food crises of the 1970s, the Korean economy achieved high growth during the fourth 5-year economic development period(1977-1981).

The government led this development strategy as before, and the objectives of the agriculture sector were sustainable growth, a stable supply of food, higher incomes in rural areas, price stabilization of agricultural products, the modernization of agricultural marketing, and the improvement of the rural living environment.

The economic development strategy of the later part of this period(1982-1988) was established and implemented by the central government. The agricultural policy was characterized as an open and structure oriented one. The basic structure of the export-leading development strategy was to increase the import of agricultural products, and to solve the problem of the decline of rural incomes due to import liberalization by the selective fostering of full-time farmers, increasing non-agricultural income through fostering manufacturing in rural areas, and an increase in agricultural income through composite farming. <Figure 1> shows the main principles of the open agricultural policy during this period.

<Figure 1> Main principles of open agricultural policy

	output increase of main grain	→	open policy
○ objective	more main grain	→	stable price level - rapid decline of rural population

			- low price of agri. products - restraint on wage increase
○ grain control	dual grain-price system	→	gradual abolishment of dual grain-price system - cease of grain-rice support - dissolve deficits of grain & fertilizer special account
○ food supply	increase of domestic food supply	→	increase of food import - selective rearing of domestic agriculture
○ rural income	increase of agricultural income	→	increase of agricultural & non-agricultural income
○ agri.structure	small-size farming	→	large-size farming - easing upper-limit of owning farmland - agricultural mechanization

Source : KREI, 「Conception of 1980s' New Agricultural Policy
, Policy Conference Series, 6. (requoted from Yong-whan Yoo, History of Agricultural Policy Changes (II), RDA, 2008, p.85)

During this period, GNP increased 8.4% annually and that of the agricultural sector grew 1.0% annually. The proportion of agricultural GNP to the total GNP decreased from 22.4% in 1977 to 10.5% in 1988, while the ratio of the employment in the agricultural sector decreased from 41.7% to 20.7%. In 1977, the trade balance showed a surplus temporarily, and the first import liberalization policy came in effect in May 1978. The second oil shock in 1979 and political instability and the decrease of rice production due to cold temperatures in 1980 reduced the growth of GNP and the agricultural sector by 4.8% and 22.0% respectively. From 1981, the economy began to grow again and the deficit of the trade balance began to decrease. From 1986 to 1988, the GNP grew annually at a rate of around 13%, and the trade balance became a surplus.

The economic policy paradigm changed from high growth to stable growth and from a government leading a protected market to a private one. The paradigm of the agricultural policy changed from self-sufficiency of the staple grain policy to a policy of opening up the market. The increasing agricultural income policy by producing more staple grain and by supporting its high price changed to a policy

of increasing farm household incomes by improving non-agricultural incomes, by developing combined farming, and by cultivating income-generating livestock, fruits, and vegetables. The development of rural manufacturing industries began by constructing rural manufacturing complexes. Also, the farming of livestock and spicy vegetables was expanded. The import liberalization of agricultural products in 1978 resulted in unstable prices of spicy vegetables and livestock, the deterioration of the farm household economy, a growth in the debt of farming households, the worsening of food self-sufficiency, and the expansion of imports of agricultural products.

The so-called ‘open agricultural policy’ was meant to stabilize prices while both loosening the price supporting policy and liberalizing the import of agricultural products based on comparative advantage theory, but it resulted in ruining the rural economy. Implemented policies were reducing the debt of farming and fishing households, expanding rural manufacturing complexes for non-agricultural income increases, giving tax exemptions to factories located in rural areas, increasing the supply of farming finances for increases in agricultural income, and strengthening the project for successors in the farming and fishing industries. These policies were the first overall measures for rebuilding the rural economy ruined by economic development through open industrialization, but it had its own limitations. Instead of solving the rural income problem by reducing debt and by increasing the non-agricultural income, a policy of improving the basic structure in agriculture should have been implemented.

(4) Period of preparing trade liberalization (1989 – 1994)

Due to the trade surpluses from 1986 to 1988, the Korean economy was satisfied with the Balance of Payments (BOP) clause of the General Agreement of Trade and Tariffs (GATT) of 1989. Most agricultural products could be imported because of the three import liberalizations from 1989 to July, 1997. The paradigm of agricultural policy changed to strengthen the international competitive power of agriculture and to improve the agricultural structure. The completion of the

Uruguay Round of Multilateral Trade Negotiations (UR) of Dec. 15th 1993 forced the Korean government to implement a production-neutral income policy and to improve production facilities and basic structures in the agricultural sector.

The three overall measures for improving the basic agricultural structure were announced from 1989 to 1994. The first one of April, 1989 established the Agriculture and Fishery Development Corporation for promoting the structural improvement in agriculture, forestry and fisheries and the Farmland Management Fund for financing the purchasing of farmland and for nurturing farming cooperatives and trust farming companies. Other key policies promoted the development of non-agricultural income resources, the development planning of township settlements, and the nurturing of the export sub-sectors of apples, pears, pork and flowers. The second one of 1991 made the 1989 plan concrete when 42 trillion Won (about $40 billion) was invested in rural structural improvement from 1992 to 2001. The third one of 1994 increased this investment by 15 trillion Won with a newly created Rural Special Tax in order to complete the project by 1998, three years earlier than originally planned.

(5) Period of trade liberalization (1995 - present)

With the start of the WTO on Jan. 1, 1995, the agreement of 'tariffication' made all agricultural products except rice trade-liberalized. Most agricultural policies which were price non-neutral were not implementable anymore. Rice price supporting programs and other government subsidies were gradually abolished. Rice was the only commodity still facing non-tariff barriers. For Korea, the trade-liberalization of rice was postponed until the end of 2004, but MMA amount of rice should be imported for those ten years. Through the renegotiations in 2004, the trade-liberalization of rice was once more postponed, this time until the end of 2014. The MMA amount was increased and a small proportion of the imported rice began to appear on the consumer market.

Further liberalization is expected when the WTO/DDA negotiation concludes. Meanwhile many countries try to agree on FTAs with relevant trading partners,

which also result in the trade-liberalization of agriculture. Korea is no exception. In 2004, Korea completed its first FTA: the Korea-Chile FTA. Since Korea has made FTAs with Singapore, EFTA, ASEAN, EU and Peru. Now, the U.S.-Korea FTA is awaiting ratification by their respective legislative branches of government.

2) Status Changes of Agriculture in the Korean Economy

During the 1950s and 1960s, the vast majority of Koreans lived in rural areas. As industrialization began and the industrial structure was changed in the 1970s, employment opportunities increased in urban areas so as to push the excess rural population from rural areas to urban areas.

<Table 6> shows that because of rapid industrialization, the rural population of 14.42 million in 1970 was reduced to 10.82 million by 1980, 6.66 million by 1990, 4.03 million by 2000, and 3.12 million by 2009. By 2009, the rural population had dropped 78% from 1970. Meanwhile, the total population by 2009 was 48.75 million, an increase of 51% from 32.24 million in 1970.

<Table 6> Changes in the total population and the rural population of Korea

(in thousand person)

Year	Total population	Rural population	Year	Total population	Rural population
1970	32,241	14,422	2000	47,008	4,031
1975	35,281	13,244	2001	47,357	3,933
1980	38,124	10,827	2002	47,622	3,591
1985	40,806	8,521	2003	47,859	3,530
1990	42,869	6,661	2004	48,039	3,415
1995	45,093	4,851	2005	48,138	3,434
1996	45,525	4,692	2006	48,297	3,304
1997	45,954	4,468	2007	48,456	3,274
1998	46,287	4,400	2008	48,607	3,187
1999	46,617	4,210	2009	48,747	3,117

Source : www.krei.re.kr

<Figure 2> The trend of the total population and the rural (farmhouse) population of Korea (in thousands).

Source : made by author

The cultivated area of Korea decreased year by year because the number of others uses for farmland grew enormously as economic development accelerated industrialization and urbanization. The decrease of cultivated areas due to massive diversification was much larger than the increase of cultivated areas until 1971 due to land clearing. However, its decline became not so significant after 1972. The cultivated area was 2.3 million hectares in 1970, and it was 1.74 million hectares in 2009, a drop of .56 million hectare over those 40 years. The proportion of cultivated land to total area was 23.3% in 1970, and it dropped to 17.4% by 2009.

<Table 7> Changes in the total area and the cultivated area of Korea

	total area (in thou. ha)	cultivated area (in thou. ha, %)		cultivated area per farm household (in are)	cultivated area per capita (in are)
1970	9,848	2,298	23.3	93	7.31
1975	9,848	2,240	22.7	94	6.46
1980	9,899	2,196	22.2	102	5.76
1985	9,912	2,144	21.6	111	5.29
1990	9,926	2,109	21.2	119	4.92
1995	9,927	1,985	20.0	132	4.45
1996	9,931	1,945	19.6	132	4.27
1997	9,937	1,924	19.4	134	4.18
1998	9,941	1,910	19.2	135	4.11
1999	9,943	1,899	19.1	137	4.05
2000	9,946	1,889	19.0	137	3.99
2001	9,954	1,876	18.8	139	3.96
2002	9,959	1,863	18.7	146	3.91
2003	9,960	1,846	18.5	146	3.86
2004	9,962	1,836	18.4	148	3.82
2005	9,965	1,824	18.3	143	3.78
2006	9,968	1,800	18.1	145	3.73
2007	9,972	1,782	17.9	145	3.68
2008	9,983	1,759	17.6	145	3.62
2009	9,990	1,737	17.4	145	3.56

Source : www.krei.re.kr

<Figure 3> shows the trends of the total area, cultivated area, and cultivated area per farm household. Although the total cultivated area continuously declines, the cultivated area per farm household increased slightly because the rural population decreased much more quickly.

<Figure 3> Trends of the total area, the cultivated area, and cultivated area per farm household of Korea

Source : made by author

<Table 8> shows the farm household income, the GDP per capita, Farm household assets, the economic growth rate, and the growth rate of the agriculture sector of Korea. The farm household income in Korea was 260 thousand by 1990, and jumped to 30.81 million Won by 2009 which was 120 times larger than 1970. Meanwhile GDP per capita was 90 thousand Won in 1970 and increased to 21.95 million Won by 2009, a 243 fold increase from 1970. Farm household assets were 920 thousand Won in 1970 and increased to 358.03 million Won which was 391 times larger than 1970.

<Table 8> Farm household income and assets, GDP per capita, growth rates

(in thou. Won, %)

	farm household Income	GDP per capita	farm household asset	economic growth rate	growth rate of agriculture sector
1971	356	1	1,100	10.4	5.1
1975	873	290	4,588	7.3	5.0
1980	2,693	1,010	13,384	-1.9	-17.0
1985	5,736	2,050	28,378	7.5	5.8
1990	11,026	4,460	79,352	9.3	-5.9
1995	21,803	9,050	158,171	8.9	6.7
1996	23,298	10,070	168,901	7.2	4.0
1997	23,488	10,940	184,503	5.8	4.2
1998	20,494	10,640	192,334	-5.7	-7.7
1999	22,323	11,630	154,226	10.7	5.1
2000	23,072	12,770	159,975	8.8	1.1
2001	23,907	13,720	166,765	4.0	1.6
2002	24,475	15,140	170,465	7.2	-2.2
2003	26,878	16,040	204,527	2.8	-5.4

2004	29,001	17,260	243,665	4.6	9.1
2005	30,503	17,960	298,178	4.0	1.3
2006	32,303	18,840	356,963	5.2	1.5
2007	31,967	20,160	395,981	5.1	4.0
2008	30,523	21,280	341,227	2.3	5.6
2009	30,814	21,950	358,029	0.3	3.2

Source : www.krei.re.kr, www.bok.or.kr

<Figure 4> shows the trends of farm household income and GDP per capita of Korea. Both continuously increased, except in 1997 because of the financial crisis. <Figure 5> shows the growth rates of the Korean economy and of its agricultural sector. In most years, the economy as a whole grew faster than the agricultural sector when both had positive growth rates, but the agricultural sector decreased much faster than the former when both had negative growth rates. Exceptions were found in 1979, 1981, 1992, 2004 and 2008.

<Figure 4> Trends of farm household income and per capita GDP of Korea

Source : made by author

<Figure 5> Growth rates of Korean economy and its agriculture sector

Source : made by author

<Table 9> shows farming machinery owned by farm household of Korea year by year. Farm households had 11,884 tillers in 1970 and 714,537 tillers in 2009, a sixty fold increase. The number of owned tractors was 61 in 1970 but increased to 258,662 by 2009, a 4,240 fold increase. Agricultural mechanization in Korea has continuously progressed. However, major progress happened during the mid and late 1990s. The launch of the WTO and the 'tariffication' of the agriculture sector effected the changes in the mechanization of Korean agriculture. <Table 10> shows the production and sales of agricultural chemicals. Both peaked in 2000 and 2001 and declined afterwards. In the 2000s, people become more

concerned about the quality of food rather than its quantity. So-called eco-products become popular in the 2000s.

<Table 9> Owned farming machinery

(in unit)

year	tiller	tractor	transplanter	binder	combine	controller	grain dryer
1970	11,884	61	-	-	-	-	-
1975	85,722	564	16	-	56	-	694
1980	289,799	2,664	11,061	13,652	1,211	-	1,616
1985	588,962	12,389	42,138	-	11,667	-	5,437
1990	756,489	41,203	138,405	55,575	43,594	50,699	17,749
1991	768,332	52,973	167,653	62,156	54,079	78,368	23,553
1992	768,371	64,159	185,172	63,103	61,240	106,715	27,195
1993	799,105	76,800	211,299	65,117	67,677	162,269	31,963
1994	836,810	88,706	229,354	66,404	70,203	201,498	34,430
1995	868,870	100,412	248,009	66,960	72,268	239,496	28,408
1996	910,404	113,287	271,051	67,914	73,831	272,770	38,089
1997	945,844	131,358	302,934	68,903	74,258	315,852	44,132
1998	959,976	157,888	325,126	73,025	78,099	348,735	49,832
1999	953,749	176,146	335,818	73,256	84,002	369,150	53,216
2000	939,219	191,631	341,978	72,315	86,982	378,814	55,573
2001	922,709	201,089	342,648	70,333	87,805	379,922	58,213
2002	891,660	206,371	340,754	68,216	87,441	379,309	60,672
2003	857,829	211,576	335,306	63,035	86,858	376,431	63,633
2004	832,769	219,664	333,634	62,071	87,457	382,788	66,437
2005	819,684	227,873	332,393	60,008	86,825	392,505	70,363
2006	802,662	236,707	325,351	57,343	86,492	399,226	73,205
2007	771,095	243,662	314,097	52,077	84,624	410,182	73,965
2008	739,725	253,531	309,907	50,069	85,338	421,616	75,237
2009	714,537	258,662	282,854	-	79,561	406,055	75,944

Source : Major statistics of FAFF, MFAFF of Korea, 2010

<Table 10> The production and sales of agricultural chemicals

(in M/T)

	production	sales
1975	8,642	8,619
1980	17,431	16,132
1985	17,758	18,247
1990	26,610	25,082
1991	28,734	24,476
1992	28,946	26,718
1993	26,849	25,999

1994	25,656	26,282
1995	26,676	25,834
1996	25,085	24,641
1997	25,300	24,814
1998	22,073	22,103
1999	26,264	25,837
2000	29,459	26,087
2001	27,790	28,218
2002	26,585	25,844
2003	23,087	24,610
2004	23,910	25,323
2005	23,969	24,506
2006	22,847	24,076
2007	25,428	24,262
2008	22,168	25,368
2009	23,746	21,916

Source : Major statistics of FAFF, MFAFF of Korea, 2010

<Table 11> shows the changes in the production of major grains since 1970. Among major grains, emphasis has been placed on the production of paddy rice. Although the cultivated area has decreased, there were some ups and downs in the production of paddy rice. Since 2000 and 2001, not much emphasis has been placed on the production of paddy rice because of its significantly reduced demand. The productions of field rice and barley has been almost abandoned in Korea. And the production of beans remains, but there is not enough of it to meet demand since their popularity of beans has increased.

<Table 11> The production of grains (in thou. hectare & thou. household)

	paddy rice		field rice		barley		beans	
	area	amount	area	amount	area	amount	area	amount
1970	1,184	3,907	20	32	342	667	295	232
1975	1,198	4,627	20	42	322	699	274	311
1980	1,220	3,530	13	21	111	267	188	216
1985	1,233	5,618	4	7	64	162	156	234
1990	1,242	5,600	3	6	37	94	152	233
1991	1,207	5,380	2	4	29	67	119	183
1992	1,156	5,328	1	3	22	57	105	176
1993	1,135	4,748	1	2	21	49	117	170
1994	1,102	5,058	1	2	15	35	122	154

1995	1,055	4,694	1	1	15	43	105	160
1996	1,049	5,322	1	1	15	39	98	160
1997	1,052	5,448	1	2	10	23	100	156
1998	1,056	5,089	2	8	13	24	98	140
1999	1,059	5,238	8	24	12	30	87	116
2000	1,055	5,239	17	52	11	22	86	113
2001	1,056	5,450	27	64	14	30	78	118
2002	1,039	4,891	15	36	12	29	81	115
2003	1,002	4,416	15	36	9	20	80	105
2004	984	4,960	18	40	9	23	85	139
2005	967	4,735	13	33	8	22	105	183
2006	945	4,659	10	21	8	20	90	156
2007	942	4,389	8	19	8	22	76	114
2008	928	4,825	8	18	8	22	75	133
2009	918	4,899	6	17	7	18	70	139

Source : Major statistics of FAFF, MFAFF of Korea, 2010

<Table 12> shows the changes in livestock production. The number of livestock farming households has declined, while the number of livestock has increased. It implies that the size of livestock farming in Korea becomes larger and larger.

<Table 12> Production of livestock

(in thou. unit & thou. household)

	beef		pork		chicken	
	unit	household	unit	household	unit	household
1970	1,286	1,120.0	1,126	884.0	23,633	1,338.0
1975	1,556	1,277.0	1,247	654.0	29,939	1,094.0
1980	1,361	948.0	1,784	503.0	40,130	692.0
1985	2,553	1,048.0	2,853	251.0	51,081	303.0
1990	1,622	620.0	4,528	133.0	74,463	161.0
1995	2,594	519.0	6,461	46.0	85,800	203.0
1997	2,735	465.0	7,096	27.0	88,251	162.0
1998	2,383	427.0	7,544	27.0	85,847	168.0
1999	1,952	350.0	7,864	24.0	94,587	210.0
2000	1,590	290.0	8,214	24.0	102,547	218.0
2001	1,406	235.0	8,720	20.0	102,393	201.0
2002	1,410	212.0	8,974	17.0	101,693	176.0
2003	1,480	188.0	9,231	15.0	99,019	144.0
2004	1,666	189.0	8,908	13.0	106,736	131.0
2005	1,819	192.0	8,962	12.0	109,628	136.0
2006	2,020	190.0	9,382	11.0	119,181	3.6

2007	2,201	184.0	9,606	10.0	119,365	3.4
2008	2,430	181.0	9,087	8.0	119,784	3.2
2009	2,635	175.0	9,585	8.0	138,768	3.5

Source : MFAFF of Korea, Major statistics of FAFF, 2010 & Statistics of other livestock, 2009

<Table 13> shows the changes in the production of major vegetables. The cultivated area of vegetables has declined as well. The production of Chinese cabbage and radish has gradually decreased. However, the production of hot pepper and garlic shows an increasing trend because of the new cultivating methods of green-housing or mulching resulting in increased productivity.

<Table 13> Production of vegetables

(in hectare & M/T)

	Chinese cabbage		radish		hot pepper		garlic	
	area	amount	area	amount	area	amount	area	amount
1980	47,820	3,039,571	48,541	1,972,683	132,703	125,056	37,080	252,768
1981	48,917	3,457,423	47,936	2,015,689	151,037	137,575	26,198	153,537
1982	49,602	3,496,417	48,109	1,970,432	113,368	130,465	27,873	185,807
1983	42,236	2,993,163	37,036	1,568,407	122,188	194,184	33,468	220,183
1984	47,494	3,359,547	40,106	1,738,243	99,796	116,910	39,734	200,189
1985	41,266	2,790,073	37,521	1,586,463	117,877	165,277	39,015	256,201
1986	48,131	3,408,955	37,683	1,705,240	128,963	197,804	48,240	369,846
1987	36,709	2,433,981	34,818	1,536,499	88,975	137,924	49,198	400,782
1988	44,261	2,503,171	41,990	1,756,862	99,599	249,361	36,994	303,304
1989	41,922	2,795,567	39,196	1,841,776	73,838	190,159	38,505	356,954
1990	47,495	3,373,364	37,127	1,760,593	64,855	177,339	43,643	416,774
1991	42,163	2,731,385	36,220	1,558,212	73,406	194,681	49,160	480,513
1992	39,609	2,405,626	33,294	1,516,217	80,342	248,245	43,494	464,649
1993	54,686	3,730,452	35,946	1,600,763	88,652	267,214	36,241	392,908
1994	42,504	2,689,186	38,863	1,592,949	93,361	290,398	34,959	362,344
1995	46,483	2,884,772	35,518	1,435,296	92,198	316,352	39,636	461,735
1996	48,008	2,997,721	39,722	1,728,018	95,529	332,408	41,973	455,955
1997	43,351	2,702,300	35,313	1,463,259	82,135	322,341	36,292	393,834
1998	46,798	2,779,120	37,102	1,602,350	70,152	288,102	37,337	393,903
1999	44,674	2,523,563	34,763	1,441,050	80,659	436,646	42,416	483,778
2000	51,801	3,149,255	40,238	1,759,357	80,130	391,298	44,941	474,388
2001	49,539	3,040,648	38,751	1,731,869	76,253	411,750	37,118	406,385
2002	39,236	2,316,755	31,387	1,411,783	76,724	381,156	33,153	394,482
2003	47,686	2,678,271	35,051	1,561,341	63,150	350,174	33,140	378,846
2004	44,623	2,865,485	36,303	1,709,943	68,379	410,281	30,237	357,824

2005	37,203	2,325,330	27,130	1,277,483	67,023	395,293	31,766	374,980
2006	42,035	2,749,399	30,497	1,494,839	58,703	352,966	28,594	331,379
2007	34,265	2,217,149	25,835	1,194,327	60,842	414,136	26,986	347,546
2008	37,285	2,584,908	27,308	1,402,187	54,885	385,763	28,416	375,463
2009	34,321	2,528,966	23,780	1,256,423	50,521	350,436	26,323	357,278

Source : Major statistics of FAFF, MFAFF of Korea, 2010

3. Economic Development and the Role of Agriculture in Korea

Korea has trod the path of modernization and industrialization for the past 60 years, and it has grown to become an economic power that ranks near 10th in the world.

The reduction in the relative weight of agriculture over the course of economic advancement has been a common experience among advanced countries. Korea had experienced changes in its industrial structure at a speed that had been two to five times faster than those of advanced countries.

<Table 14> Changes in the national economic status of agriculture

Classification	The relative rations in GDP				The relative ratios of employment		
	Agriculture, forestry, and fisheries	Agriculture	Forestry	Fisheries	Agriculture, forestry, and fisheries	Agriculture and forestry	Fisheries
1970	29.2	25.5	2.0	1.7	50.4	49.5	0.9
1975	27.1	24.0	1.5	1.7	45.7	43.1	2.5
1980	16.2	13.8	1.1	1.2	34.0	32.4	1.6
1985	13.5	11.6	0.8	1.7	24.9	23.7	1.2
1990	8.9	7.8	0.4	0.8	17.9	17.1	0.8
1995	6.3	5.5	0.2	0.6	11.8	11.2	0.6
2000	4.9	4.2	0.2	0.4	10.6	10.2	0.4
2005	3.4	3.0	0.2	0.2	7.9	7.6	0.3

Source : National Accounts, the Bank of Korea

The Korean economy is often said to be on the level of advanced countries, but the agriculture is said to be on the same level as developing countries. In the same way, if we take a look at the relative ratios of agriculture of the OECD

countries in 2005, the relative ratios in the GDPs were about 1%. The relative ratios of the total number of the employed in the GDPs were between 2% and 3%. In comparison, Korea has generally been showing levels that are about two times higher.

If we take a look at the trends of some of the relative ratios of the agricultural GDPs of Korea, they are as follows: 25.5% in 1970, 13.8% in 1980, 7.8% in 1990, and 2.9% in 2005. Therefore, the average annual rate of reduction from 1970 to 2005 was 6.0%. And the relative ratios of those employed in agriculture and forestry were as follows: 49.5% in 1970, 32.4% in 1980, 17.1% in 1990, 10.2% in 2000, and 7.6% in 2005. Therefore, they have been reduced by an annual average of 5.2% from 1970 to 2005.

The role of agriculture in the Korean economy can be summarized and outlined as follows:

First, agriculture plays the role of producing and supplying food. The fact that Korea achieved self-sufficiency in rice production in 1978 through the green revolution was an important accomplishment considering that the staple food of Korea is rice. Even though the self-sufficiency rate of the staple has continued to fall since then, the stable supply of the good has been firmly established indicating the important role it plays in agriculture.

Second, agriculture contributes to the development of other industries. It brought forth the advancement of commerce and transportation through the exchange of agricultural products with other daily necessities and industrial crops and livestock products being supplied as industrial raw materials, thus forming a part of the manufacturing industry. The agricultural materials industry, which is related with the production of fertilizer, agricultural chemicals and machinery, etc., has been developed as a down stream industry, while the food industry has been developed as an upstream industry where agricultural produce are processed.

Third, agriculture plays the role of preserving the natural environment and the national territory. Agriculture is basically an environment-friendly industry. Since

modern times, agriculture has caused some pollution problems due to the use of synthetic chemicals. Even so, there are more positive functions in terms of environmental preservation. Green plants refine air, and green space has been providing amenities. Recently, the non-economic functions of agriculture, such as flood control, water source development, air purification, and land preservation, have been emphasized. And bits of evidence have been found one after another indicating that the economic value of such "public good" functions are much greater that the economic value found in agricultural production.

Fourth, agriculture promotes the preservation of genetic resources. At present, thee are more than one million living species on Earth. Such a diversity of biological species plays an important role in maintaining the harmony of the natural world. In particular, Korea has four distinct seasons. It can be said that the natural conditions of Korea have been blessed by heaven. The country has the world's sixth largest plant genetic resources. The probability of being able to advance bio-industries by utilizing these agricultural genetic resources is very high.

Fifth, agriculture promotes social and economic stability. Food is an indispensable element for human life. Therefore, the decline of agriculture soon brings about the decline of related industries and thus makes the nation's economic and social life unstable. In addition, agriculture maintains the population of rural villages through the creation of income by employing the labor force of rural villages. When the regional society in rural areas collapses, the urban problems will be more serious accordingly, and it is a matter of course that the traditional culture of rural villages will then disappear. The natural scenery, which provides rest to citizens, can only be maintained through the continued existence of agriculture, forestry, and fisheries.

Ⅲ. Changes and Roles of Agricultural Investment in Korea

1. Periodical Characteristics and Roles of Agricultural Investment in Korea

1) Concept and Types of Agricultural Investment

In general, agricultural investment means political, fiscal and financial supports for stable rural living by increasing the farm household's real income for the real growth of agriculture and for improving competitive power in the long run. It also includes the farm household's own financing for capital accumulation and its expansion of facilities as well.

Some special features of Korean agricultural investment are the large amount of government support through low-rate loans that were invested at the initial stage. That led, however, to an increase in farmers' debt because the initial facility installation and operation costs were larger than expected. In most businesses, two or three years are required to reach the break-even point. If too much is invested initially, the focus is on financing operational costs such as raw materials, oil, and labor and on the repayment of the loan and its interest, instead of being on marketing and production management.

In this research, we classified the agricultural investment of Korea into three sectors: the public sector, including government investment; the private sector, including corporations; and farm households, including cooperative organizations. The economic effectiveness of those investments will be analyzed. The analysis, however, will focus on the public sector's agricultural investment. This focus is due to the significantly important role government support played when the agricultural sector had serious difficulty in its initial capital accumulation during the industrialization of Korea.

2) Periodic Trends of Agricultural Investment in Korea

As Korean society developed into a modern industrial one, Korean agriculture became more fragile than other industries. Fiscal support in the agricultural sector is required to improve its productivity and to increase the average farm household income. In addition, to expand fiscal support for the agricultural sector, it is widely recognized that the agricultural distribution system, including market pricing, should be improved for developing the rural area. The periodical changes in the agricultural investment of Korea are as follows.

Since the liberation of Korea from Japanese in 1945, the agricultural sector has followed the American capitalist model, but it still remained underdeveloped until the 1960s. Because of the Korean War, the economic destitution of Korea spread to all industries. Although the agriculture, forestry and fisheries sectors occupied significant proportions in the economy during the 1950s, the capital accumulation of the agricultural sector was hardly achieved because of its poor agricultural production base.

<Table 15> Sectoral proportions of GNP (in % based on 1955 US $)

	1953	1954	1955	1956	1957	1958	1959	1960
Agri., For. & Fisheries	42.3	42.7	42.3	39.7	39.7	39.9	38.5	38.2
Mining & Manuf.	9.1	9.8	11.7	13.9	14.4	14.6	15.3	16.0
(Manuf.)	8.2	9.1	10.9	12.9	13.3	13.4	13.8	14.4
SOC & Service	48.6	47.5	46.0	46.4	45.9	45.5	46.2	45.8

Source : 『Annual Economic Statistics Report』, Bank of Korea, 1962.

The high economic growth of Korea since the 1960s was achieved by the government leading development strategies and by the open market oriented growth strategies of the 5-year Economic Development Plans. With little capital accumulation, it was inevitable that the government would lead the development strategy. Especially in the field of agricultural investment and loans, the means to improve agricultural productivity and to advance the agricultural structure were implemented with the government's aggressive political support.

Before 1960, one of the most serious problems in rural areas was private usurious loans. This problem could be solved by increasing farm household income, by revitalizing financial institutions in rural areas, and by expanding appropriate loans through institutions. The establishment of rural financial institutions began in the 1960s.

During this period, Korea suffered from chronic food shortages, so Korea needed to import food to make up for the shortages. The self-sufficiency of food would lessen the demand for food imports and would keep the wage market lower, helping the industrial development strategy of Korea. Thus, the agricultural investment during the high-growth period emphasized constructing agricultural production bases through land cultivation and land reclamation for increased rice production.

Korean agriculture changed to machines and technology oriented farming in order to improve the agricultural productivity. As the demand for agricultural materials such as fertilizer, pesticides and farming machines and implements increased, short-term operating funds occupied the major portion of the agricultural loans. Over 60% of the short-term funds were provided by private loans until the 1970s, but these loans were supplied by financial institutions while the mutual financing of the National Agricultural Cooperative Federation of Korea (NACF) became vitalized. Great changes in financing occurred in rural areas.

As the agricultural market began to open from the 1980s due to multilateral trade negotiations, the first step of market liberalization was fully discussed and the agricultural market was faced with a more competitive period due to the open-market policy upon the launch of the WTO in 1995. This change in the agricultural circumstances resulted in significant drops in food self-sufficiency, a surge in food imports, deterioration of agricultural productivity, and safety problems with imported food.

Korean agriculture with a small-scale structure from the beginning had difficulties in overcoming family centered and small-sized farming. Moving to the

open-market, policies focussed less on agricultural investment and loans and more on business oriented economic entities such as full-time farmers with competitive agricultural productivity. In the 1990s, the limitation of the Full-time Specialist Farmers Fostering Project was recognized and less emphasis was placed on agricultural investment and more was placed on nurturing agriculture-related corporations. The enactment of the Special Act for Rural Development and the Farmland Act made structural support focus on profitability, stability and the sustainability of the agri-business, and more efforts were made to reduce the gap in productivity and income between rural and urban areas. The fact that 82 trillion Won of investment and loans were issued shows a continuing effort to improve the competitive power of Korean agriculture during 1992-2002 period.

As Korean agriculture entered a new paradigm, the government changed its evaluation criteria of agricultural and rural investment and loans to compensate for a weak agricultural base and low productivity, and instead took the initiative of mid- and long-term investment and loan projects. A total amount of 119 trillion Won of mid- and long-term investment for 10 years from 2004 to 2013 would be implemented to strengthen its agriculture and to improve agricultural productivity. This policy would stabilize farm household incomes and businesses and improve rural welfare and regional development.

2. Agricultural Investment Programmes by Sector

The effectiveness of agricultural investment was evaluated through examining its operations based on periodic changes of the investment. The analysis mainly focused on the changes and effects of the investment system and policy on its operating body for these thirty years. As analyzed periodically, the 1980s were a period of high economic growth, and agriculture supported the industrialization needed to readjust its own production and the industrial structure. In the open market period of the 1990s, it was widely recognized that the new investment

and loan system should support selecting and fostering the strategic sub-sectors of agriculture with focused and systematic investments and loans.

The early stage of Korean agriculture had the characteristics of small-sized family farming and reflected the difficulties in maintaining a stable rural income. Because of these characteristics, the government took the major role in investing in the agricultural sector. Recently, more investment from private corporations and farm households are required to improve the competitiveness in the open agricultural market. How to develop and how to operate a new system for inducing those investments is being examined. The investment bodies were classified as public sector, private corporation sector and farm household sector. The effectiveness of investment will be determined by analyzing the changes in circumstances and systems of each sector's investment.

1) Public Sector

(1) Principles

Because of the structural characteristics of Korean agriculture, inducing investment from private corporations and farm households was very difficult. Under this initial investment environment, one part of the public sector's investment and loans was to cover the deficiency in private investment. Examples of this include various public supports for constructing farmers' glasshouses, diffusing farming mechanics, and constructing processing facilities for agricultural products. Another part was the public corporations' loans, supplied through fiscal funds and used for improving the economic status of farming and fishing people. Another one was the social investment for agricultural public projects such as the construction of reservoirs, dammed pools and pumping stations, irrigation improvements, arable land readjustments, large scale agricultural cooperatives, the spread of farming technology, and seed improvements. Another one was financing the establishment of agricultural public corporations.

(2) Major policy changes

There has been many changes in public strategies and policies of agricultural investment and loan projects as the circumstances of agriculture change periodically. The Public Investment and Loan Project, caused by industrialization and changes in the Korean economy, changed from a project of simple subsidies to one of raising the independence of farm households.

① Before the 1960s

When Korea established itself after being a Japanese colony, she was an agricultural nation with 77% of the total population working in the agricultural sector. The feudalistic land system of the past was a major problem to solve for improving agricultural production and for developing the agricultural sector.

Until the Amended Farmland Revolution Law was proclaimed in March 1950, various complications concerning the land ownership system were uncovered. However, it was widely recognized that a farmland revolution was necessary to improve agricultural productivity in Korea and a revolution law was proclaimed owing to the strong willingness of the government. As a result, the farmland revolution ignited the development of agricultural productivity and vitalized the rural economy by heightening the motivation of farmers. And the fund from the farmers' repayment of the farmland revolution, excepting its operating cost, was fully invested in arable land readjustment and irrigation improvements through the Special Account Law of the Farmland Revolution Project enacted in 1952. This investment greatly contributed to the increase in the food supply. The Farmland Revolution contributed to the development of capitalism in the Korean economy. It compelled the surplus labor in rural areas to immigrate to urban areas. At the farm household level, the surplus from farming resulted in an increase in farmers' earning power due to high quality labor in rural areas.

② 1960s - 1970s : rural usurious loans clearing and institutional financing system

Until the early 1960s, more than 60% of rural financing was supplied by usurious loans in Korea. Park Chung-hee's military government, the government that initiated economic development, in 1961 enacted the Rural Usurious Loans Clearing Law to clear a chronic problem in the rural areas - wide-spread usurious loans. This was the second step to solving rural problems after the farmland revolution.

The Usurious Loans Clearing National Committee and its town-level committees all over the nation took the initiative. The National Agricultural Cooperative Federation (NACF) paid back the loans defined as usurious ones with agricultural finance bonds and the borrowers would redeem the debts from the NACF. The agricultural finance bond was issued with the annual interest rate of 20% and after a one year grace period were repaid over four years. But some of the bonds were over-issued, which resulted in losses for some bond-holders. Farm household incomes were not increased enough to redeem the debts as expected because of low agricultural productivity.

The usurious loans clearing project was the turning point for establishing a rural institutional financing system. The new institutional system could finance credit to farmers so as to supply agricultural materials and to improve agricultural productivity through agricultural marketing projects. The government expanded policy financing for agricultural development through the Fiscal Fund Operation Law (enacted in Dec. 1961) and systematically tried to improve the efficiency of policy financing. The interest rates of for policy financing were 10% for 1-year short-term loans and 9% for 2-5 year mid-term loans.

The launch of the 5-year economic development plan in 1962 promoted the adoption of a new investment and loan system in the agricultural sector. Especially, the introduction of the Fiscal Loan System made farming loans available by period and by use, and new financing systems such as the Fund for Fostering Stable Farm Households (1965) and the Fund for Small-Sized Farm Households (1966) were also introduced. In 1967,as the macro-agricultural policy of the government changed, a investment and loan project to increase

agricultural production and rural income was implemented for fostering major production clusters with a 1,335 million Won loan at a 9% annual interest rate (as of April, 1968).

During this process, the government introduced the secondary compensation system (enacted in 1968) in order to increase the mid- and long- term agricultural development fund. The mid- and long- term development loans were supplied from the NACF's own fund and the government compensated the interest rate difference between the development loan and the NACF's loan to the NACF.

The 1970s was a period of new challenges and opportunities in agriculture and the rural areas due to the Saemaeul movement, a movement to improve the rural environment. The two major changes were the farmland warrant loan system introduced in 1970 and the farmers' and fishermen's credit assurance system introduced in 1971.

By allowing the farmland warrant loan, prohibited since the farmland revolution, the farmers with lower incomes could borrow. The small-sized farmers could borrow farming funds from the financial to provide new growth opportunities in agriculture introduced the no-warrant credit loan system in 1976.

In the mid-1970s, the self-sufficiency of the staple grain was achieved, the rural income surpassed the urban income and the rural economy was vitalized. The Korean government tried to accumulate 1 trillion Won of rural savings, which was attained from the increased rural income and was utilized for the farming fund. This policy increased the rural savings of 1970s and contributed to the rapid development of the mutual financing of NACF.

The establishment of various funds for agricultural development and for the specialization of some sub-sectors in the 1970s resulted in many funds with specific objectives such as the farm mechanization fund, the livestock development fund, and the composite development fund which were all heavily supported by the government.

<Table 16> Agricultural Policy Fund by project (in 100 million won)

		1971	1975
short-term loans	farm operating	110	186
	supporting export	226	566
	agricultural marketing	13	18
	sub-total	349	770
mid- and long-term loans	agri. water devel.	35	55
	farm mechanization	-	138
	agri. devel.	69	231
	rural housing	-	-
	fostering next gen.	-	-
	agri. facilities	97	116
	others	-	-
	sub-total	201	540
total		550	1,310

Source: inside data of NACF

As Korean agriculture transformed from resource centered farming to technology centered farming during the 1960s, the demand for agricultural materials such as fertilizer, pesticides, and agricultural tools increased, and the short-term fund for farm operation occupied important shares among the agricultural policy investments and loans. The Korean Public Financing System, focusing on short-term farm operating loans with low interest rates and material loans, played an important role for Korean agriculture to transform into technology centered farming. Although the short-term investment and loans were significant and increased rapidly during the 1970s as well, the investment and loans for irrigation development, agriculture development, agricultural facility building, farm mechanization, and rural housing increased as the need for more mid- and long-term funds to establish an agricultural production base was recognized.

<Table 17> Trend of agricultural policy fund (in 100 million Won)

	1965	1970	1975
short-term agri. policy fund (A)	71	286	922
farm operating fund (B)	27	107	186
mid- & long-term agri. poll fund (C)	38	108	464
total (D)	109	394	1,368
B/A	38	37	20

A/D	65.1	72.5	67.4
C/D	34.9	27.4	32.6

Source: 『50 year history of Korean agricultural policy』,KREI, 1999, p.885.

③ 1980s - 1990s :

a. 1980s : The Beginning of the Open Agricultural Policy

Korean agriculture faced new challenges as the agricultural products imports became more open after 1979. The open market policy of the agricultural products stabilized the domestic price level through the import of cheap agricultural products, so as to improve the competitiveness of manufactured goods. Since Korea showed trade surpluses from 1986 to 1989 and graduated from the BOP clause of the GATT in 1989, Korea no longer enjoyed the privilege of using quotas to control their trade balance as a developing country.

Korean agriculture encountered a new period with the open agricultural policy, as agreements on some major issues such as the opening of the agricultural market and the reduction of domestic and export subsidies were reached at the 8th Multilateral Trade Negotiation (the UR negotiation) which began in 1986. With these changes, Korean agriculture experienced the deepening instability of farm management, a decreased but older population, a decline in arable farmland, and a decrease in the food self-sufficiency ratio.

The investments and loans of the public sector for improving productivity and for changing the farm management of the rapid changing Korean agricultural sector changed from short-term programmes to mid- and long-term ones. More diversified financing channels were available such as the savings of the NACF as well as fiscal funds and borrowings from the Bank of Korea.

In the 1980s, most of the investment and loan programmes of the public sector were on the general account, and some were on the special account for fiscal investment and loan management. Special funds for promoting farming mechanization, for fostering the next farming and fishing generation, for developing rural areas, and for advancing fisheries were executed, and those were integrated into ‘The Fund for Developing Farming and Fishing Areas’ in

1991. This fund was synthesized and operated in the special account for improving the structure of rural areas.

The major projects of the public sector from this period were enacted for increasing the rural income and for reducing the rural people's debt burden. These projects developed human resources for the next farming and fishing generation, lessened the farm and fishery household's debt burden, wrote-off long term debt from the Farmland Irrigation Cooperatives (FIC),supported the budget of the FIC, constructed rural roads and wholesale markets for agricultural and fisheries products, aided the comprehensive development of rural areas, and stabilized agricultural and fisheries products and farm mechanization projects.

<Table 18> Budgets of the major agricultural projects in 1980s (in million Won)

year	l budget			major projects
	general account	special account for fund management	total	
1981	387,635	42,649	430,284	production increase and seed renovation
				farm mechanization
				agri. water development
				agri. base construction
				large-scale agri. com. development
				agri. development fund
1983	371,961	59,893	431,855	agri. water development
				agri. base construction
				farm mechanization
				large-scale agri. com. development
				agri. development
				next farming & fishing generation fostering
1985	397,131	109,537	506,668	agri. water development
				farm mechanization
				production increase
				agri. base construction
				large-scale agri. com. development
				farm operation
				agri. development fund
1987	645,415	202,895	848,310	agri. water development
				farm mechanization
				production increase
				agri. base construction
				large-scale agri. com. development
				tide embankment construction
				agri. products price stabilization

				next farming & fishing generation fostering
				farm operation
				rural manufacturing cluster
				road for rural income dev.
1989	1,034,766	396,192	1,430,958	agri. water development
				agri. base construction
				large-scale agri. com. development
				farm mechanization
				tide embankment construction
				fund for APMC
				agri. products price stabilization
				next farming & fishing generation fostering
				farm operation
				compensating the interest of farm operation loan - lessening burden of rural debts
				rural manufacturing cluster

Source: 『Budget outlook』, MFAFF, each year

The government investments and loans significantly increased to support the increase in income and the reduction of debt for farm households in the 1980s. For managing human resources, the government enacted the Fostering the Next Farming and Fishing Generation Fund Law and controlled the Agriculture and Fishery Next Generation Fostering Program with long-term low interest rate loans and training. The budget of the program was 60 billion Won during 1980-1990, and loans of 25 million Won per capita were available as of 1997 with a 5% interest rate, a 5-year grace period, and a 5-year repayment period. In 1989, considering the difficult situation of the rural economy, the government lowered the interest rates of existing loans to lessen the debt burden of farm households. The fund for compensating the interest rate difference was also in the budget.

<Table 19> Policy of lessening the rural debt burden in 1980s

fund	debt burden lessening	government policy
compensating the interest rate difference of the farm operation loan	lowering the interest rate : 10% -> 5%	86.3.5 rural com. policy 89.4.28 rural dev. com. policy
compensating the interest rate difference of agri. mid-term loan	lowering the interest rate : 10% -> 5%	87.3.16 rural debt lessening policy 89.4.28 rural dev. com. policy

compnsating the interest rate difference of farm mecanization loan	lowering the interest rate : 8~11.5% -> 5%	89.4.28 rural dev. com. policy
compensating repayment delay and interest exemption of 1983-84 livestock loan	exemption of interest	89.4.28 rural dev. com. policy
compensating repayment delay and interest exemption of small-size farm's loan	under 0.7ha : full exemption 0.7-2ha : mid-term loan 3% & mutual loan 5% limit per household : 6 million Won	89.12.30 the Special Law for Llessenin Rural Debts

Source: data from MFAFF

The government also supported the construction of the Garak-dong Agriculture and Fishery Wholesale Market from 1981, the rural complex development program of 1983, the price stabilization program including government's purchasing and storing of agricultural products and production promotion, and the farm mechanization program.

b.1990s : Changes in the agricultural policy system

Korean agriculture encountered a period of challenges and hardships because its political protection barriers collapsed due to the launching of the WTO in 1995 and the agriculture industry faced a decline in real income due to the financial crisis of 1997. This caused great damage to the rural economy.

While experiencing these crises, the government continued fiscal investments and loans for rural development and income improvement in the early-1990s. In order to increase the fiscal fund for agriculture, the Special Account for Rural Structural Development was established in 1992, the Special Account for Managing the Rural Special Tax was added in 1995, and the Special Account for Fund Management was changed to the Special Account for Fiscal Investments and Loans.

<Table 20> mid- and long-term fiscal investment and loan in agriculture (in Won)

year	9	9	9	…	9	99	…	03	0	0	…	1	14

	2 3 4 8		4 5 3
program	1st stage: 42 trillion - central gov't : 35 trillion - local gov't & private : 7 trillion	2nd stage: 45 trillion - central gov't : 38 trillion - local gov't & private 7 trillion	3rd stage: 119 trillion - central gov't: all

Source: data from MFAFF

The special account for rural structural development, newly established in 1992, included many projects for supporting costs of farm mechanization, arable land readjustment, farming water exploitation, production base improvements, processing and marketing agricultural products, and competitive power enhancement of fruits, vegetables and flowers. For improving the competitive power of Korean agriculture and the rural area structure, the government originally planned to invest 42 trillion Won during 1992-2001. Due to project specification and more effective implementation, it was extended and categorized into two stages - the 1st stage from 1992 to 1998 and the 2nd stage from 1999 to 2003 - and the total amount of the investment was increased to 48 trillion Won.

<Table 21> 42 trillion Won Program (in 100 million Won)

project	investment		
	1992-1996	1997-2001	total
o structure improvement for heightening competitive power	175,306	179,754	355,059
- fostering key farming & fishing manpower	11,972	14,038	26,010
- readjusting & extending production base	69,408	75,000	144,408
- mechanization & facility modernization	51,000	46,262	97,262
- technology renovation	6,170	7,830	14,000
- marketing & processing facility	29,065	25,635	54,700
- readjustment of fishing structure	7,690	10,989	18,679
o vitalization of rural area	33,293	28,699	61,962
- developing income sources	11,854	5,119	16,973
- improving living circumstance	21,439	23,530	44,989
total	208,598	208,423	417,021

Source: 「Budget outlook
, MFAFF, 1992

This '42 trillion Won Program' was intended to improve the competitive power of the agricultural sector and to readjust the rural production structure for preparing the up-and-coming open market era in Korean agriculture. As originally planned, 85% of the investment came from the central government and 15% came from local governments and the private sector. During the implementation of the program, the investment was increased to 48 trillion Won and the period was extended to 2004.

<Table 22> Amount of agricultural investment and loan by stage

	1st stage	2nd stage
planned period	92-98(7years)	99-04(6years)
implemented period	92-98(7years)	99-03(5years)
total amount (in million Won) - planned - accomplished - ratio (%)	487,848 486,598 99.7	450,526 409,858 91.0
average amount per year - planned - accomplished - comparison by stage (1st stage = 100) - average annual growth rate (%)	69,693 69,514 100 18.1	75,088 81,972 117.9 2.5
financing source	central & local gov't, private	central & local gov't, private

Source: data from MFAFF

The budget and investment for constructing the agricultural base was larger in the 1990s than it was in the 1980s. This reflected the need for infra-expansion to enhance agricultural productivity, to solve the food security issue, and to create a stable agricultural income. Investment was focused on the large scale rural comprehensive development project which included the construction of pumping stations, drainage facilities, and dammed pools; the readjustment of arable land; and the reclamation of land.

④ After the 1990s : The Pursuit of New Agriculture in Korea

As the second liberalization era came after the open agricultural policy period of the 1990s, the proliferation of FTAs and the progress of the DDA negotiation made Korean mid- and long-term agricultural development face the addition of an open market. The change of the investment and loan program of the public sector was inevitable for strengthening the agricultural production base, stabilizing farming management, improving rural welfare, and developing rural areas.

Although the government leading investment and loan program of the past was an appropriate policy tool for constructing the agricultural base, it changed to a program with more involved private corporations and farm households for the renovation of open agricultural management.

Considering the changes in its environment and in its new paradigm and the evaluation of the previous investment and loan programmes, the new investment and loan program of 2004 reflected the systematic changes in selecting and supporting the investment priorities. Instead of a uniformly supporting system, a selective system focused on supporting excellent farmers was adopted so as to readjust the agricultural base, to stabilize farm income and business, and to minimize farm debt.

The budget structure of agricultural, forestry, and fishery industries was changed to increase the proportion of the general account and to reduce the borrowing of the agriculture special account. And the revenue from the Agriculture Special Tax was changed in order to support rural education and welfare and regional development. In order to reflect the changes in the Korean agricultural environment, the investment and loan program was evaluated every three years and readjusted appropriately to those environmental changes. A total amount of 119 trillion Won was planned to be invested from 2004 to 2013 with 51 trillion Won of that amount invested during the first five years.

<Table 23> The investment and loan program (in 10 billion Won, %)

	total	04-08	09-13
budget	9,630 (100.0)	3,994 (41.5)	5,636 (58.5)
-subsidy	8,011	3,293	4,718
-loan	1,619	701	918
fund	2,229 (100.0)	1,057 (46.0)	1,242 (54.0)
-subsidy	913	418	495
-loan	1,386	639	747
sub-total	11,929 (100.0)	5,051 (42.3)	6,878 (57.7)
local gov't	1,633	660	1,003
private	621	325	296

Source: data from MFAFF, 2004

The 119 trillion Won investment and loan program of the government from 2004, reflecting the agricultural paradigm changes, selected four major projects: strengthening agricultural competitive power, stabilizing farm business and income, renovating agricultural marketing and raising food safety, and improving rural welfare and developing rural areas. The agricultural policies of the past were changed and expanded to food and rural development policies. A selective and differentiating support system was adopted to enhance the efficiency of the program. Emphasis was placed on stabilizing farm income resources while expanding the direct payment system instead of the agricultural price supporting system, and the rural area was reformed into an area for living and for rest as well as for production.

The investment and loan program was originally 119 trillion Won, but environmental changes such as the U.S.-Korea FTA will increase the amount to 123 trillion Won by 2013. The performance of this program was evaluated during the 1st stage, the result of which was used to adjust the 2nd stage projects.

<Table 24> Investment and loan program for agri. & rural area (in 100 million Won)

	original	adjusted	changes
total (2004-2013)	1,192,903	1,232,092	39,189
1st stage (2004-2007)	395,934	415,112	19,178
2nd stage (2008-2013)	796,969	816,980	20,011

agri. competitive power	570,686	632,371	61,685
1st stage	203,479	225,231	21,752
2nd stage	367,207	407,140	39,933
farm income & business	339,443	299,201	△40,242
1st stage	100,110	103,727	3,617
2nd stage	239,333	195,474	△43,859
agri. marketing & food safety	103,202	119,495	16,203
1st stage	41,752	36,518	△5,234
2nd stage	61,450	82,977	21,527
rural development & welfare	179,572	181,025	1,453
1st stage	50,593	49,636	△957
2nd stage	128,979	131,389	2,410

Source: data from MFAFF

Agricultural competitive power was strengthened through the launch of the farming registration, the expansion of the direct payment for business turn-over, the training of full-time farmers, the supporting of farm facility modernization, and the adjustment of the production base. The stabilization of farm incomes and businesses, the introduction of 'direct payment for farm household income stabilization' and the expansion of the agricultural disaster insurance system were also adopted. To renovate agricultural marketing and raising food safety, this program also supported agricultural technology renovation and future-growing industry fostering through enlarging bio-tech research. Fostering the agri-food industry and revitalizing the rural area to improve the rural environment were of concern during the 2nd stage. These efforts of the public sector's investment and loans significantly contributed to attaining a sustainable agricultural sector and to establishing a stable production base for Korea. In 2004, the managing body of the agricultural policy fund was established. This body with scientific and active management could implement more detailed investment and loan programs through products and farm households so as to raise the competitive power of Korean agriculture.

2) Private Sector

(1) Principles

Traditionally Korean agriculture has developed through land and labor intensity. Since the industrialization of the Korean economy, the price of land and labor has increased. So without a change to capital intensity, the increase in factor prices made Korean agriculture lose its competitive power. Investment is determined by the investment-profit ratio (IPR), so the agricultural sector with low IPR has difficulty in inducing investment from the private sector. As mentioned above, the public sector's investment has played a major role in developing Korean agriculture.

There are some limitations in the private sector's in only by farmers' and limited farmland warrant loans have had negative effects on the private sector's investments and loans into the agricultural sector.

In this part of the paper, the development and economic effects of private investments and loans will be reviewed in two fields: the (private) association of farm machinery manufacturers and the agricultural fund for developing agriculture, food and other related industries.

(2) Major investments of the private sector

① Farm mechanization and the association of farm machinery manufacturers

Before the 1960s, Korean farmers used a plow for cultivation, an arranger for land arrangement, a hand-trasher for trashing, and a rice-cleaner for processing. Those tools were early-stage farm machines used with either man-power or animal-power.

Korean agriculture at that time was readjusting its agricultural base, improving its farm business, stabilizing its agricultural prices and increasing its farm household income. Under the circumstances of modernizing agriculture, middle-stage farm machines such as tillers, deep-plowing machines, sprayers, water pumps, and generators began to be used.

Although farm mechanization was supported by the government, not enough demand was derived because farmers were short of money. The farm

mechanization was not as successful as originally planned. Farm machinery makers suffered from this demand shortage, because the government encouraged them to expand their production facility and to increase their employment.

The total number of farm machinery makers reached 200 at the time, but only 55 joined the Association of Farm Machinery Manufacturers. 35% of the manufacturers had their capital under 10 million Won and only 33% had their capital over 100 million Won. Supply surpluses in the farm machinery market gave manufacturers slim profits, and their production facilities were hardly modernized. In 1963 the first joint venture with a foreign manufacturer started, and this adoption of advanced foreign technology increased to 80 percent, and the exploring and the expansion of the strategy farm machinery export market was prepared and implemented.

The success of the first 5-year economic development plan from 1962 brought in the labor movement from rural to urban areas and the growth divergency between the two areas. The government actively promoted farm mechanization to substitute labor immigration and to ease the growth divergency. To increase the farmers' purchasing power, both subsidies and loans for purchasing farm machinery became available. Only subsidies were previously available.

During this changing period, a manufacturer specialized in producing power farm machineries emerged, and production parts, not yet home produced, were supplied from Japan using the Japan-Korea Claiming Fund to Promote the Domestic Production of Farm Machinery.

Owing to the farm mechanization policy and supply promotion of the government, the farm machinery industry grew rapidly from the late-1960s and wide usage of the tiller was accelerating farm mechanization in Korea. While the foundation for farm mechanization was successfully established in the 1960s, the tiller and the water pump, used to prevent droughts, were widely used with government subsidies and loans in the 1970s, representing the development of farm mechanization. The 1970s was the second stage of farm mechanization,

where the basic plan of farm mechanization was accomplished and the fund required for the plan was supplied as well.

The 5-year plan for farm mechanization was prepared in 1972, and 30 billion Won from the Citizen's Investment Fund was supplied for farmers to purchase farm machinery. And the supporting policy was prepared to foster both composite and small & medium specialized farm machinery manufacturers.

From the late-1970s until the late-1980s, the diffusion of transplanters and binders, the mechanization of plains, and the fostering of a co-utilizing organization of farm machinery were implemented. Policies that organized machinery equipped farming groups, strengthened after-service for farm machines, and improved the quality of farm machines were pursued as well. From the late-1980s until the late-1990s, mechanization, previously centered on rice paddies, was expanded to dry fields, horticulture, and the fruit and livestock sub-sectors. The expansion of machinery equipped farming groups made farm machines more widely used, the training of machinery usage and maintenance more substantial, and after-service facilities more available. The rapid opening of the agricultural market in the 1990s required more advanced farm mechanization and facility modernization for improving the competitive power of Korean agriculture, and the government tried to fulfil those requirements.

However, the farm machinery half-price supply policy of the early 1990s, contributing to promote farm mechanization, resulted in an over-supply of farm machinery and the stagnation of farm mechanization after 1998. To make Korean agriculture sustainable, farm mechanization after 2000 focused on growing eco-friendly agriculture by developing environmental preserving insect and pest control technology and effective mechanical fertilization technology. Owing to the development of advanced mechanization technology, the farm mechanization of Korea advanced to make farming easer and more convenient.

<Table 25> Owned major farm machinery (in unit)

	1975	1980	1985	1990	1995	2000	2005	2010

tiller	85,872	289,799	588,962	756,489	868,870	939,219	819,684	698,145
tractor	564	2,664	12,389	41,203	100,412	191,631	227,873	264,834
transplanter	16	11,061	42,138	138,405	248,009	341,978	332,393	276,310
binder	-	13,652	-	55,575	66,960	72,315	60,008	-
combine	56	1,211	11,667	43,594	72,268	86,982	86,825	81,004
controller	-	-	-	50,699	239,496	378,814	392,505	407,997
grain dryer	694	1,616	5,437	17,749	28,408	55,573	70,363	77,830
farm heater	-	-	-	-	42,153	127,557	186,246	-
farm dryer	-	-	-	59,434	117,875	164,532	184,097	207,808
dispenser	137,698	330,663	517,530	680,034	682,675	600,061	-	-
water pump	65,993	193,943	286,298	341,548	384,900	292,871	-	-
others	127,194	223,355	330,839	290,698	163,423	80,034	-	-

Source: 「Major statistics of MFAFF
, MFAFF of Korea, 2011

In rural Korea, most farming has been dependent on traditional farmers' mutual cooperation such as Gye, Dure and Pumasi. This tradition helped give birth to several cooperatives and associations in the agricultural sector. From the 1960s the government helped the private sector establish cooperatives and associations in several industries. One of them was the Association of Farm Machinery Manufacturers in 1962. This association played a significant role in rural reconstruction and agricultural production increases through farm mechanization. Membership in the association has increased, and it has become the key player in the growth of Korean agriculture.

An association is financed by the contributions of its members. The contribution is a primary source of the association to pursue its objectives and to improve its members' economic status. In this paper, this contribution will be treated as a private sector investment. The contributions and development of the association of farm machinery manufacturers for 30 years, from 1962 to 1992, will be analyzed.

In 1962, each of the 77 original members of the association contributed 10 thousand Won respectively. The association needed more funds for its operation

to establish and expand farm mechanization. In 1965, the number of members and the total amount of contributions increased to 90 members and to 5.05 million Won respectively. The contribution of the association increased to 10.89 million Won in 1970, 17.52 million Won in 1975, 43.88 million in 1980, and 77.2 million Won in 1990. This increase made it possible for the association to distribute high-quality farming tools and to expand its maintenance training and after-service facilities. Efforts have been made to increase the contribution, which secured the financial independence of the association. Most members agreed that the increase in contributions would keep and expand its operation of improving Korean agriculture.

<Table 26> The changes in the contribution (in thou. Won)

year	contribution		changes	
1962	77 (in unit)	770	- (in unit)	-
1965	505	5,050	428	4,280
1970	363	10,890	△142	5,840
1975	584	17,520	221	6,630
1980	447	43,880	△137	26,360
1985	687	68,700	240	24,840
1990	772	77,200	85	8,500
1992	865	86,500	93	9,300

Source: 「Thirty years of the cooperative of farm machinery manufacturers
, The cooperative of farm machinery manufacturers, 1993.

② Agriculture Fund and MIFAFF Fund of Funds'

After 2000 the environment of Korean agriculture significantly changed. New ways of investment were discussed to establish a good circle of agricultural investment. Limitations on the government-leading investment and loan programs were recognized, and new financial engineering methods were needed to attract the private sector's investment in the agricultural sector. One of the solutions was the MIFAFF Fund of Funds. The objective of the fund was to foster agriculture, food, and other related industries.

In the financial market, the first Agriculture Fund was financed in Dec. 2001 with 10 billion Won, where 33% was invested by the MFAFF of Korea. This Agriculture Fund invested in the firms of agriculture and livestock production, marketing and processing, and especially in R&D and fertilizer related firms. In Dec. 2008, the fifth Agriculture Fund was financed and operated with 15 billion Won. Although five Agriculture Funds were financed, a limited number of firms enjoyed investment from the funds because many agricultural related firms have weaknesses in marketing, profitability and stability, which come from their small-sized management, unclear ownership, and underdeveloped accounting systems. Improvement in managing systems is required to induce private investment.

<Table 27> The Agriculture Funds

	operating com.	date	amount	major investor
1st fund	Muhan Investment Co.	Dec. 2001	10 bil.	MFAFF 3.3 bil.Wooribank
2nd fund	Korea Bio-tech Inv.	Dec. 2002	8 bil.	MFAFF 5 bil.NACF
3rd fund	Nexus Investment Co.	Jan. 2007	10 bil.	MFAFF 4 bil.NACF
4th fund	Mirae Asset Venture	Dec. 2007	20 bil.	MFAFF 10 bil.NACF
5th fund	Samho Green Inv.	Dec. 2008	15 bil.	MFAFF 10 bil.

Source: data from MFAFF, 2009

From 2010, a government-private joint venture fund - the MIFAFF Fund of Funds - was introduced in the financial market. This new fund was financed to invest in the capital of cooperatives or firms, the objective of which is the investment in farm business entities and food related firms. Farm business entities are selected through business competitions, and the selected entities are financed by the MIFAFF Fund.

<Figure 6> Operating mechanism of the MIFAFF Fund of Funds'

Agri-food Investment Union
Private Equity Fund
Venture Capital Union

- Agricorporation & Farm Corporations : Product , Distribution, Manufacturing Process
  * Agribusiness Venture : Business Incubator, Venture Process
  * R&D etc : Technology Certification, Invention Patent

* Agri-food Company : Product , Distribution, Manufacturing Process
* Allied Business : The front Industry, The rear Industry

Fund of Fund in Agri-food
Fund of Fund
Baby Fund
Investment V
Vehicle

Source: http://www.moaf.or.kr/matrix/matrix3.asp

<Table 28> The details of the MIFAFF Fund of Funds'

operating firm	inv. field	name of entity	capital	amount financed by the MIFAFF Fund
Green Busan Investment	general in agri. & food	Green inv. coop. of FAFF	200	90
Aju Ivy Inv.	general in agri. & food	1st Aju-Agri Gen. inv. coop.	200	100
Michigan Venture Cap.	food	Michigan global food inv. coop.	250	100
Hyundai Sec.& Tongyang Inv.	general in AFF	Hyundai-tongyang private inv.	320	157
Company K Finance	general in AFF	Company K partner's inv.	200	100
Asia Inv.	general in AFF	1st Nanum AFF inv.	200	100
Nau Ivy Capital	food	1st Nau AFF inv. fund	200	80
Mirae Asset Venture Inv.	project fund	Mirae Asset Agro. Proj. inv.	200	80
Capital One	fishery	1st Capital One inv. fund	200	80

Source : http://www.moaf.or.kr/matrix/matrix5.asp

3) Farm Household Sector

(1) Principles

Since most farm households in Korea were small-size family-centered ones, little investment had been financed by farmers. After the farm households were able to use the investment and loans furnished by the government after the 1960s, most of the investment by farmers was its operating costs for agricultural production and management. In this paper, the investment by farm households will be analyzed by investigating the capital investment and operating costs of farm household businesses. These statistics have been produced from the sample survey of the Statistics Office of Korea.

<Table 29> sample size of the farm household economy survey (in unit)

year	1962	1967	1970	1975	1980	1985	1990	1995	2000	2005
size	1,163	1,176	1,160	2,517	3,375	1,998	2,990	3,072	3,040	3,048

Source: The Statistics Office of Korea, 2011

We will also analyze the mutual financing system in this section, a system useful for solving the problem of usurious loans and uninstitutional financing in the early stages of the agricultural sector. The mutual financing system is for short-term financial needs of NACF member farmers, which was not fulfilled by the mid- and long-term policy investment and loans of the public sector. And this mutual financing helped expand the investments of farm households.

(2) The Capital Investment and Operating Costs of Farm Households

① 1960s - 1970s

Capital investment of farm household represents its business size and is evaluated as follows: the value of reproductive capital goods used in agricultural production; the cost of farmland improvements, readjustment (both owned and rented), and reclamation: purchasing and other material cost among the increased value of farmland and input values of family labor; beginning of the year present value of buildings, machinery, tools, and other materials except big plants and big livestock; end of the year value of agricultural liquidity assets such as agricultural products not sold, purchased materials not used, and small livestock; and operating costs of the year except depreciation. As the government policy put emphasis on improving the agricultural productivity in the late 1960s, the capital investment of farm households increased with farmland improvement and farm mechanization. And the expansion of the *Saemaeul* movement after 1970 resulted in the increase of capital investment and operating cost.

The operating cost of farm households consisted of seeds, fertilizer, pesticides, other agricultural materials, farm tools, rent for farming facilities, and interest.

As the government did during the 1960s and 1970s, farm households tried to improve their productivity for raising self-sufficiency rations of staple grains. Most of the farm household's operating costs were used to improve its productivity. <Table 30> showed that the operating cost increased from the early 1970s, reflecting the increase in the self-sufficiency ratio of rice.

<Table 30> Capital investment and operating cost (in Won)

year	total revenue	capital investment	operating cost
1962	73,416	90,602	19,390
1963	100,925	120,198	24,383
1964	128,072	102,707	24,327
1965	115,991	79,831	27,179
1966	131,407	126,525	29,977
1967	150,995	146,500	34,643
1968	177,083	181,861	40,147
1969	214,617	226,759	47,489
1970	248,064	260,768	54,027
1971	356,567	360,126	64,658
1972	427,994	461,806	74,613
1973	480,263	547,021	89,943
1974	664,411	750,801	122,509
1975	890,954	970,698	176,116
1976	1,165,956	1,248,033	244,763
1977	1,333,586	1,549,147	297,450
1978	1,769,116	1,881,586	413,448
1979	2,027,162	2,277,508	495,887

Source: 「Farm household economy statistics
, the Statistics Office of Korea, 2010

② 1980s - 1990s

The economic development plans after the 1960s and the *Saemaeul* movement of the 1970s was a turning point for Korean agriculture in improving its rural structure for productivity enhancement. More emphasis had been on

constructing the rural production base and increasing rice production. The ratio of the operating costs to total revenue increased during the period. A higher proportion of operating costs were used for developing specialized products and improving marketing.

Korean agriculture encountered a new challenge as the WTO was launched in 1995. In an effort to overcome this crisis, capital investment increased from the early 1990s. The government policy also changed to support farm households investments.

<Table 31> Capital investment and operating cost (in Won)

year	total revenue	capital investment	operating cost
1980	2,342,169	2,497,079	587,353
1981	3,269,433	3,203,159	792,970
1982	3,997,856	3,793,758	966,498
1983	4,701,737	5,701,499	1,370,776
1984	5,276,692	6,541,108	1,577,374
1985	5,476,908	6,488,409	1,777,972
1986	5,619,067	6,555,090	1,941,790
1987	5,984,424	6,960,475	1,968,411
1988	7,225,963	6,613,551	2,314,143
1989	8,211,757	9,400,422	2,595,610
1990	9,077,953	10,815,339	2,814,064
1991	10,096,579	11,984,434	3,061,791
1992	10,777,886	13,928,434	3,421,666
1993	12,926,969	17,439,082	4,500,444
1994	15,346,670	19,217,322	5,021,479
1995	16,011,701	21,323,318	5,542,643
1996	17,283,547	25,707,231	6,446,936
1997	17,284,351	25,782,346	7,080,310
1998	16,630,069	29,056,901	7,674,765
1999	18,637,657	30,046,563	8,071,701

Source: 「Farm household economy statistics
, the Statistics Office of Korea, 2010

③ After the1990s

Korean agriculture of the 2000s, the second stage of agricultural liberalization, encountered a new era of market openness and competition. Instead of increasing production, the new objectives became real income enhancement and business stabilization. The changes in the operating cost of farm households

occurred as well. The operating cost for production and the marketing of strategically selected items increased.

<Table 32> Capital investment and operating cost (in Won)

year	total revenue	capital investment	operating cost
2000	19,513,632	31,425,235	8,616,551
2001	20,193,150	32,661,061	8,926,621
2002	19,951,491	32,144,716	8,677,074
2003	23,610,634	45,019,145	13,038,926
2004	26,622,580	48,117,814	14,572,430
2005	26,495,897	49,720,501	14,680,603
2006	27,322,313	51,184,175	15,230,731
2007	26,101,994	51,418,069	15,696,265
2008	25,843,026	53,930,636	16,188,723
2009	26,621,461	52,516,563	16,923,564
2010	27,220,716	53,323,362	17,122,708

Source: 「Farm household economy statistics
, the Statistics Office of Korea, 2010

(3) Mutual financing of farmers

① Before the 1960s

There was no agricultural financial institution in rural areas because the country was devastated by the Korean war. Some money available in rural areas moved to urban areas for higher interest rates and eventually transformed to commercial capital. Therefore, agricultural financing was hardly supplied by the private sector. The following are several characteristics of the agricultural financing of this period.

First, agriculture related financing was made available not through some specific agricultural institutions but through all financial institutions including financing cooperatives, and most of the financing was short-term farm operating funds.

Second, there was no institution for dealing with mid- and long- term agricultural development funds. All the development funds, because of their low profitability, were financed by the public sector.

Third, only usurious loans were available for most of the farm households, because of the short supply of institutional financing in agriculture.

<Table 33> farm household's financing by source (in %)

source	May 1953	Oct. 1956	Early 1958	Dec. 1959
financial coop. or agri. bank	19.2	17.8	26.7	37.8
other financial institution	-	0.3	-	2.2
Gye (mutual financing with others)	7.9	9.2	6.5	54.0
private lending	72.9	75.7	66.8	54.0

Source: 「50-year History of Korean Agricultural Policy
, KREI, p.861. 1999

② 1960s - 1970s

A new approach to a single institution for agricultural development was introduced in the 1960s when no agricultural financing system was yet established. The agricultural sector still shared a higher proportion of financing than other industries. In 1961, the government tried to solve the problem of low growth rate of and high dependency on usurious loans for farm households. The usurious loans occupied a total of 68.9% of households' financing at the time. Changing those farm household's financing from usurious loans to low-interest rate institutional loans was necessary for Korean agriculture to develop. The Korean government enacted the rural usurious loans clearing law. There were some difficulties in repaying the agricultural financial bond to the lenders. Eventually institutional loans were made available for most of the farm households from the late 1970s.

<Table 34> average farm household's financing by source

year	institutional loan		private loan		total
	amount(Won)	ratio(%)	amount(Won)	ratio(%)	amount(Won)

1961	1,478	31.1	3,273	68.9	4,751
1963	2,115	31.7	4,554	68.3	6,669
1965	2,284	21.6	8,286	78.4	10,570
1967	2,501	21.9	8,931	78.1	11,432
1969	2,586	20.7	9,932	79.3	12,582
1971	2,671	26.0	7,611	74.0	10,282
1973	3,191	23.2	10,574	76.8	13,766
1975	9,673	28.9	23,761	71.1	33,434

Source: data from MFAFF

The merger of the old-NACF and the agricultural bank was a significant event in Korean agriculture in the 1960s, because this new NACF could provide an improved environment for farmers where both agricultural financing and agricultural materials were available.

Although the function of the new NACF was mandated by the government, the function of NACF financing complemented the government mid- and long- term investment and loan program. In the 1970s, mutual financing as a unit of the cooperative's credit programs was growing to contribute to the foundation of agricultural investment and the loan program. Mutual financing of a unit cooperative intended to induce surplus money in rural areas, to increase savings of its members, and to provide loans for its members. This type of mutual financing was implemented independent of the government, which had another significant meaning in the agricultural financing system.

③ The 1980s - the 1990s

Mutual financing had grown rapidly from the 1980s and played a very important role in providing agricultural financing for members of the cooperative. Other financial institutions had to compete with mutual financing in the agricultural financial market in the 1980s. The rapid decline of the private loan in the rural areas of the 1980s was possible owing to the development of mutual financing, which brought in positive effects such as improvements in farm household incomes and the stabilization of farming businesses.

<Table 35> average farm household's financing by source (in thou. Won, %)

year	mutual financing		growth rate of deposits in mutual financing	ratio of private loan	ratio of coop. loan
	amount	growth rate			
1980	245	66.7	33.6	49.0	48.7
1981	379	54.7	54.7	48.1	49.4
1982	586	54.6	44.2	33.3	63.1
1983	728	24.2	13.9	32.8	64.0
1984	845	16.1	19.8	31.3	64.3
1985	1,060	25.4	25.6	28.9	66.1
1986	1,253	18.2	31.2	29.3	65.5
1987	1,814	44.8	41.7	21.5	71.9
1988	2,461	35.7	44.7	15.3	80.2
1989	3,531	43.5	29.6	16.1	78.7
1990	4,770	35.1	34.7	13.9	81.5

Source: data from MFAFF

④ After the 1990s

As the proliferation of FTAs accelerated the opening of the Korean agricultural market, more long-term investment and loan programs were required to improve the competitive power of Korean agriculture. The launch of the WTO in 1995 and Korea's joining the OECD in 1996 also increased competition in the world agricultural market. New programs for rural development and policy revolution were taken and more agricultural financing was supplied in Korea.

While the annual growth rate of agricultural loans by institution was 12.7% after the 1990s, the annual growth rate of mutual financing was 18.1%. This implies that mutual financing became more important in agricultural financing after the 1990s. This is because capital-intensive agricultural products such as vegetables, flowers, fruits, special crops and livestock has rapidly grown since the 1990s, and more funds were supplied through mutual financing. The shortage of agricultural capital in the early stages was successfully overcome by the public sector's mid- and long-term investment and loans and by the farm household's short-term

loans - mutual financing. For farmers, these two financing methods complemented each other.

<Table 36> trend in agricultural financing (in 100 million Won, %)

year	agricultural loan by financial institution			B/A
	total (A)	by NACF	by mutual financing (B)	
1991	178,919	63,580	107,381	60.0
1992	205,924	63,911	129,943	63.1
1993	245,106	70,534	156,592	63.9
1994	309,201	85,604	197,678	63.9
1995	375,230	104,608	238,424	63.5
1996	437,540	133,631	288,135	65.9
1997	522,071	124,573	355,220	68.0
annual growth rate	17.2	12.2	18.1	

Source: data from MFAFF

3. Implications on Korean Agriculture

Before 1960, the Farmland Revolution contributed to construct and to expand the agricultural production base through raising farming motivation and improving irrigation facilities. This change brought about increased agricultural productivity and an increased food supply. The 5-year economic development plan from 1961 made the Korean economy achieve industrialization and rapid growth. Korean agriculture focused on increasing farm income and establishing the foundation for agricultural modernization, achieved through food production and production base construction.

The *Saemaeul* movement of the 1970s was a voluntary movement motivated by self-reliance and mutual help. It changed the rural economy significantly. The rural structure was improved, agricultural productivity was increased, the self-sufficiency ratio of staple grains was raised, and farm income increased. Korean agriculture encountered a period of hardship because of the opening of markets in the 1980s. More emphasis was placed on raising the competitive power of

agriculture through farmers' voluntary efforts and through support from the government and private corporations. The efforts to improve the agricultural structure continued after the 1990s through the cooperation of public and private sectors.

Investment and loan programs contributed to increase the productivity and competitive power of Korean agriculture. At the early stage of agricultural development, the government played a major role in making investments and providing loans because no significant capital had been accumulated by either the private sector or by farmers. Large-scale projects to construct an agricultural base and to increase agricultural productivity were mainly supported and financed by the public sector. Recently, it has been recognized that investments from private corporations and farmers should be encouraged more.

<Table 37> trend in agricultural investment of Korea

year	1965	1970	1975	1981	1985	1992	1999	2003	2008
public sector (in mil. Won)	109	394	1368	4302	5066	56000	63000	77100	109200
private sector (in thou. Won)	5050	10890	17520	43880	68700	86500	67*	30*	50*
average per farm (in thou. Won)	79	260	970	3,203	6,488	13,928	31,425**	45,019	53,930

note: * are the amount of the agriculture fund of 2001, 2002 and 2008 respectively.
** are for the year of 2000

In the 1960s, most investment and loans were used to increase the productivity and to raise the self-sufficiency ratio of staple grains as well as to clear rural usurious loans. Little investment was made by private corporations and farmers. No major changes happened in the 1970s, but the small-scale matching of funds by farmers was added to the investment and loans from the government.

In the 1980s, a period of opening up the market, the involvement of the government declined because of fiscal difficulties in financing. Investment and loans of the private corporations and of farmers began to increase. 'The principle of farmland owned only by farmers' and limited farmland warrant loans limited

the urban private sector's investment and loans in the agricultural sector. The first stage of liberalization - beginning with the UR negotiation in 1986 - and the second stage of liberalization - launched with the WTO in 1995 - made the investment and loan system of Korea transfer its key role from the public sector to private corporations and farmers. The latter put more emphasis on improving the competitive power of Korean agriculture.

After 2000, the investment and loan system was changed to increase the role of private corporations through the Agriculture Fund and the MIFAFF Fund of Funds'. As the farm household's investment was concerned, the capital investment of farm households increased from the 1980s. The mutual financing system of unit cooperatives supplied short-term funds for farm households complemented the changes in the government's investment and loan programs. <Table 37> shows that the investment of farm households increased after 2000.

<Figure 7> investment and loans of the public sector in Korea

Source: made by author

<Figure 8> investment of farm households of Korea

Source: made by author

IV. Summary and Conclusion

During the industrialization process of the economic development plans, Korean agriculture experienced many changes. In the 1960s, low productivity and a shortage of rice production resulted in the surge of farm debts, which could have devastated the Korean agricultural foundation. Constructing an agricultural foundation and improving productivity were required during the industrialization process, so the government supported the agricultural sector through investment and loan programs.

In the 1950s, Korean agriculture solved the farmland ownership problem through the Farmland Revolution of 1950. The 5-year economic development plans of the 1960s brought in major changes to the agricultural sector. The government increased investment and loans to raise productivity and to increase rice production, which secured a reasonable level of farm income.

The *Saemaeul* movement of the 1970s helped construct an agricultural foundation for improving the agricultural structure of Korea, and the financial support for the *saemaeul* movement by the government played an important role in constructing bases and increasing the incomes of farming households. During the period, more than 90% of the investment and loans were financed by the government, because the investment and loan system of private corporations and farmers was not established yet.

The adjustment of the agricultural production base through the government's investment and loan programs established a stable agricultural production system and made an environment for agricultural restructuring. The investment and loan program for the large-scale irrigation of land to increase rice production helped Korean agriculture stabilize in the long run.

During the market opening period of the 1980s, the investment and loan system for agriculture changed. More balanced investment and loans were required among the government, private corporations, and farmers, so private

corporations and farmers became more important in the system. Agricultural capital goods began to be supplied by using new financial methods such as cooperatives and agricultural funds. The mutual financing of unit cooperatives became important by the 1990s and the Agriculture Fund and the MIFAFF Fund of Funds' were introduced in the 2000s.

Recently private corporations and farmers had major roles in agricultural investment and loans, and the government put more emphasis on establishing a stable system for agricultural investment and loans. After the agricultural market opened in 1995, private corporations tried to improve their investment and loan systems for raising the competitive power of agriculture and for stabilizing farm incomes and businesses. And farmers increased their capital investment for raising their competitive power as well.

More discussion is necessary on how to develop and operate sustainable and desirable investment and loan systems in the long run. The system should support secure food security continuously, foster the food industry, stabilize the agricultural and food markets, vitalize the rural areas, alleviate economic and farmland regulations, expand welfare, develop an eco-friendly agricultural industry, strengthen international cooperation, and research and develop new technologies.

The history of the investment and loan system of Korean agriculture has the following implications.

First, The Farmland Revolution of 1950 was enacted to settle a new landlord-tenant system on the farms. Before the Korean War, Korea suffered from political instability, a deficiency of the necessary commodities, a rapid population increase, absolute food shortages, an unstable farmland ownership system, and a threat of severe inflation. The abolition of the old landlord-tenant system established, even if small in size, a self-owned farming system. Farmers had new incentives to improve their productivity and to increase their production.

Second, the Rural Usurious Loans Clearing Law was enacted in 1961, and the merger of the Comprehensive Agricultural Cooperatives and the Agricultural

Bank resulted in establishing the NACF. Before 1960, one of the most serious problems in the rural areas was the prevalence usurious loans. The governmen decided the solution to this problem was increasing farm household incomes, revitalizing financial institutions in rural areas and expanding the appropriate loans through institutions. The new government swiftly announced it would register all private loans of farmers and repay all registered loans by issuing an Agriculture bond through unit cooperatives. Farmers had to pay back new loans with lower interest rates to those unit cooperatives. A newly established financial institution, the NACF, began to function in rural areas to supply farmers with investments and loans.

Third, In order to attain the balanced growth of industry and agriculture during the first two 5-year economic development plans, the government invested to expand cultivated land, to readjust arable land, and to improve farmland productivity. However, the agricultural growth was far behind the rate of industrial growth.

Fourth, The *Saemaeul* Movement in the 1970s was a national movement for improving the rural living environment based on mutual help and self-reliance. The movement also changed the farmers' attitudes into a so-called 'can do' spirit. The *Saemaeul* movement was a power-house of modernization for Korean society and was evaluated as a successful rural development model. During this period, Korean agriculture developed rapidly due to a self-sufficiency in staple foods and the stabilization of the farm household economy.

Fifth, land reclamation and irrigation have been one of the important reasons Korean agriculture developed. With a small size of arable land, the objective of attaining self-sufficiency of staple grains was difficult to achieve. The public sector's investment had been on land reclamation for expanding the arable land and on irrigation for improving farmland productivity.

Sixth, to stabilize the farm income and to increase the rice production, a significant proportion of the government's investment was on a price support policy and R&D for a high yielding variety of rice. 'Tongil' rice was developed and

widely disseminated in 1971. The self-sufficiency of staple grains was achieved by both 'Tongil' rice and new cultivating technologies in the 1970s - the 'Green revolution' occurred.

Seventh, rapid economic growth contributed to the development of Korean agriculture by providing capital and technology. Since the limitations of the government-leading investment and loan program were recognized, new financing from the non-agricultural sector was needed. In the financial market, the first Agriculture Fund was financed in Dec. 2001 with 10 billion Won, where 33% was invested by the MFAFF of Korea. Another way to induce the private sector's investment was the MIFAFF Fund of Funds,' the objective of which was to foster agriculture, food and other related industries.

Eighth, the Farmland Revolution of 1950, the usurious loans clearing law of 1961, the *Saemaeul* movement, and the Green revolution of 1970s would not have happened without strong leadership in Korea. More than investment and effort was needed to develop Koran agriculture. After constructing the agricultural foundation, new leadership invested in improving agricultural productivity and in stabilizing farm income through irrigation, farm mechanization, facility modernization and technology renovation.

Ninth, one of the tasks of Korean agriculture is to hand-over farm businesses to the next farming generation. There are too many over-aged farmers and too few young farmers in rural areas. A simple economic approach is not enough to make rural areas comfortable eco-friendly living spaces. Investment is needed to improve the social, cultural and educational environment in rural areas.

Tenth, the difference between farm and urban incomes became greater as the Korean economy developed. The liberalization of the agricultural market after 1995 prohibited the price support policy of agricultural products, and the import of low agricultural products deteriorated farm businesses. A new welfare approach should be considered to improve the farm business environment.

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