MIGRATION IMPACTS ON THE CHANGE OF FAMILY FARM STRUCTURE IN KOREA*

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I. Introduction

The main objective of this paper is to analyze the migration impacts on the change of family farm structure in the process of industrialization in Korea. Industrialization, in a general term, is the process of social change transfering energy, capital and human resources from the rural/agricultural sector to the urban/industrial sector. Industrialization leads to a new mode of nonfarm production and creates new jobs in urban areas. Therefore, rural to urban migration occurs inevitably during the process of industrialization. Migration, theoretically, happens by pulling and pushing factors among sectors. However, in a practical sense, migration, particularly in countries such as Korea, occurs as a result of government policy that allocates resources and development opportunities to certain sectors or regions.

Rural to urban migration has been encouraged by the government policy with an assumption that it is benefit for both the industrial and agricultural sector. Rural to urban migration has been a mechanism supplying cheap laborforce for industial development. By using low-wage laborforce, the industrial sector could produce commercial goods at low cost and, therefore, could compete with

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foreign goods in the international market. On the other hand, rural to urban migration could contribute to improve agricultural productivity by increasing per capita farm size. Most population in traditional Korean society engaged in agriculture, which was characterized by low productivity and surplus of labor. Thus, migration of farm population to the nonfarm sector has been considered desirable for transforming Korean agriculture from a low-productive traditional agriculture into an efficient modern farm business.

During 1965-90, farm population decreased by 3.4 percent annually while the total population increased by 1.6 percent per annum. As a result, the farm population decreased from 15,812 thousand to 6,661 thousand during the same period. As it was assumed, rural to urban migration has substantially contributed to the industrial development through supplying cheap laborforce to the industrial sector and to the increase of agricultural productivity (Chung and Oh, 1991)

However, recent studies indicate that family farms suffer from over migration and the discontinuity of family farms. Chung (1991) argues that the average farm size in Korea did not increase as much as expected, though there has been a substantial decrease in farm population. Under the condition of subsistence farm economy, the farm size has a close positive relationship with the size of family. According to Chung, when the farm household head is getting old and the family size becomes smaller, then the farm size also decreases. Therefore, selected migration of young members of farm household has resulted in the problems of aging farm household heads, absence of farm successors, decrease in family farm size, which eventually leads to a rapid decrease in number of family farms.

Choe and Oh (1992) insist that the number of family farms in the process of industrialization in Korea has decreased rapidly because of discontinuity of farm household life cycle, F-cycle[1]. They

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[1] Cho and Oh (1988) suggested that the amount of asset of a farm household economy has a cycle as a family has a life cycle. They named it F-cycle insisting that the amount of asset of a farm household begins to increase after a new farm family is established. However, it stops to increase at a certain point of F-cycle and begins to decrease because of increases in farm household expenditure such as education tuition, marriage expenditure of children, and the inheritence of assets to their children. They try to interprete the creation, development and extinction of a family farm by the F-cycle.

agrue that family farms, in the Korean agrarian society, were created, developed and succeeded according to the principle of F-cycle. But in the industrialized society, family farm are not succeeded by farm family successors as the opportunity cost of farm laborforce increases, which leads the farm laborforce to migrate to the nonfarm sector. Therefore, the number of family farms decreases rapidly in the process of industrialization.

Kim (1993) argues that the family farm system in Korea, which was established in the 1950s by the land reform, has been disorganized since the mid-1970s because of the absence of farm successors, and the rapid decrease of family laborforce and new entries into family farms. He identifies family farm consisting of owned farmland and family laborforce. According to Kim, the increase of leased farmland, the withering away of family laborforce and the increase of absence of family farm successors have lead to the disorganization of the family farm system in Korea.

Since the industrialization process has been rapid in Korea, the impacts of migration on the change of family farms must be enormous. Many studies have analyzed the migration impacts in Korea, but most of them have focused on urban problems such as housing, education, transportation, pollution, poverty, slum, crime..... etc. in urban areas. In the process of industrialization, family farms continuously release laborforce to the urban/industrial sector, leading to a disequilibrium. Therefore, family farms must be restructured to adjust to the new environments for a new equilibrium. If the restructuring process is not synchronized with the outside change, problems are bound to occur. What happened to the family farms in Korea during the last 30 years?

II. The Concept and the Major Characteristics of Family Farm

Family farm was not a common term in Korea until the 1980s. When farmland is scarce and farm laborforce is abundant, the ownership of farmland becomes the most important issue. Therefore, owner farm and tenancy were the most keen issues in Korean agriculture until the 1970s. However, as the farm population has decreased rapidly, the access to farmland has become easy as the supply of farmland for rent

has increased. On the other hand, the farm laborforce has become scarce. In the 1980s, as the farm household heads aged, the labor shortage became worse, the discontinuity of farm succession increased, and the family farms faced a crisis in their sustainability. Thus, family farms have become an issue since the 1980s in connection with the restructuring policy of Korean agriculture.

The term "family farm" in Korea identifies with the term "farm household" in a broad sense. Land Reform Law defines a farm household as "a legitimized social unit engaging in farming as a main business by using family labor, either household head or some of members of the household[2]. Here, the meaning of "farming as a main business" refers to the farming for the purpose of earning household living expenditure by using more than one half of family laborforce either ways of direct tilling or farm managing. Therefore, the farm household defined by Land Reform Law identifies with family farm.

Family farm is composed of two different terms: family and farm, which means that a family engages in farming. Since the meaning of family differs from society to society, defining the meaning of family in a sentence is a real difficulty. However, if it is defined by a most common understanding, the family is a social unit consisting of a spouse and their consanguines who share same kitchen and shelter. According to the family law in Korea, a family consists of a household head, spouse and their direct patrilineal ancestor, descendants and their spouses. Any one who lives together in a household, if the person is not a spouse or a patrilineal consanguinity of the household head, the man can not be a member of the family unless he is adopted by law or be a family member through marriage. Therefore, the term "family farm" in Korea refers to the household of a family consisting of a spouse and consanguinity of the household head engaging in farming directly by using family laborforce.

According to the above definition, there were 1,767,033 family farms, occuping 99.92 percent to the total farms and 1,468 nonfamily farms, which accounts for only 0.08 percent to the total farms in

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[2] Family and household are different terms. Household refers to a family unit sharing a common kitchen and shelter. A family may consist of more than two households. Therefore, the term "family" is a broader meaning than the term "household."

Korea in 1990. Family farms also occupy 99.2 percent to the total acreage. Most family farms in Korea are small scale and operated by family laborforce. The family farms with less than 1.0 ha accounted for 58.1 percent, while the family farms with over 3.0 ha were 2.5 percent in 1990.

TABLE 1. Status of Family Farm, 1990

	Number of Farms	Farm Size Distribution						Acreage Share ha(%)
		not owned	less than 1.0 ha	1.0 - 2.0 ha	2.0 - 3.0 ha	over 3.0 ha	sub total	
Family farms	1,767,033 (99.92)	23,803 (1.4)	1,027,160 (58.1)	543,027 (30.7)	129,510 (7.3)	43,533 (2.5)	1,767,033 (100.0)	1,809,053 (99.2)
Nonfamily farms	1,468 (0.08)	154 (10.5)	744 (50.7)	155 (10.6)	80 (5.5)	355 (22.8)	1,468 (100.0)	14,327 (0.8)
Total	1,768,501 (100.0)	23,957 (1.4)	1,027,904 (58.1)	543,182 (30.7)	129,590 (7.3)	43,868 (2.5)	1,768,501 (100.0)	1,823,380 (100.0)

Source : *Agricultural Census*, MAF, 1990

Since family farm is contrasting to corporative farm, the characteristics of family farm can be identified as follows. First, the property and the managerial right of the farm should belong to a natural person of a family. This is one of the most clear distinctions that distinguish a family farm from the corporative farm. The property and the managerial right of a corporative farm do not belong to a natural person but to a corporation. However, the farmland of a family farm is not neccessary to be owned. The family farm may rent farmland from other persons to increase farm size. In an extreme case, a family may rent farmland for farming purpose even if the family owns no farmland. In this sense, the concept of family farm is different from that of owned farm.

Second, the farming of a family farm should be managed by family labor. Here, the meaning of "managed by family labor" does not mean the farming by only family laborforce. Family farm may employ labor workers for farming. But at least, the manager as well as the farm workers of the farm must be one of the members of the

family.

Third, the farming business of a family farm should be an important income source for the family living. Thus, any family whose farm income constitutes the total family household income with a very small portion may be inappropriate to be accounted a family farm[3]. However, the member of a family farm may engage in nonfarm jobs or operate nonfarm business to earn the extra family income.

Fourth, the farmland possessed by a family farm, which is an important family property and the means of production for family income earning, must be succeeded through generations[4]. If the farmland is not succeeded through generations, it comes from one of the following reasons: farming business is not profitable; possessing farmland is not economical; increase in opportunity costs of farm laborforce in the nonfarm sector. If the farmland as the means of production is not succeeded through generations for one reason or another, it means, in the Korean context, the disorganization of the family farm system.

III. Analytical Frame

Korea has launched a series of 5-year economic development plans since 1962. During the industrialization process, the agricultural sector has played a role of supplying cheap laborforce and food to the urban industrial sector while the agricultural sector has pursued to improve farm labor productivity through the increase in farm size. According to the dual sector model, as farm population migrates to

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[3] Even it is true, setting criteria for distinguishing family farm by the portion of farm income to the total family income is another research area.

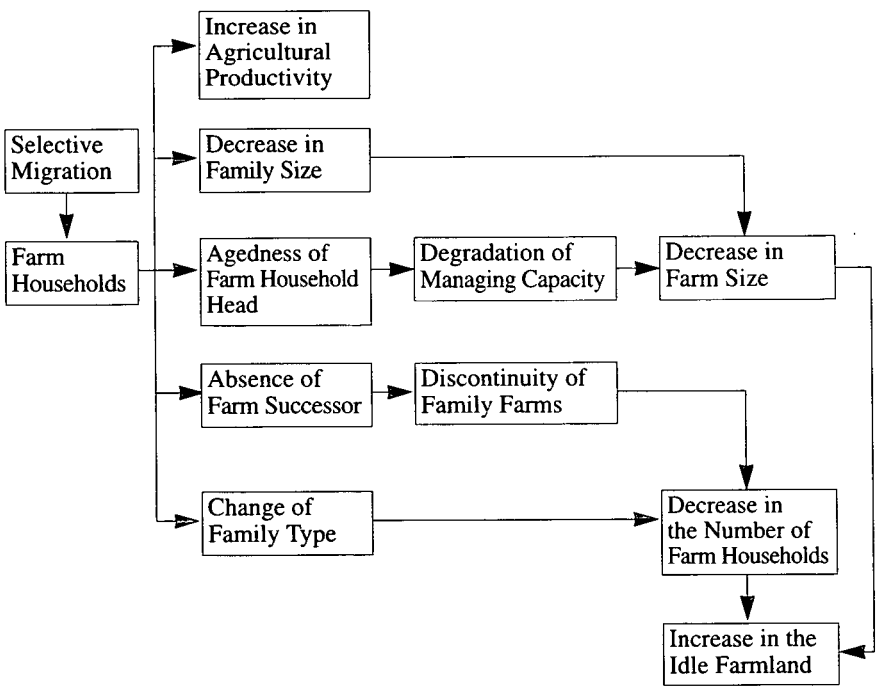
[4] It may be inappropriate in a free capitalist society saying that the farmland of the family farm must be succeeded through generations since every body has the right to choose his own jobs. Therefore, the childrens of family farms could choose nonfarm jobs while the childrens of nonfarm families enter to the farming. Thus, one generation farm could exist. However, in Korea, the case of new farms who enter from nonfarm family is almost non, and the childrens of the family farms who remain at the farm as farm successors consist a very small portion. Therefore, if the farmland is not succeeded through generations, it means, in the context of Korea, that the family farm system is not maintained.

the nonfarm sector, the farm size and agricultural labor productivity increase since the farmland and the agricultural products per farm employee increase.

However, the dual sector model ignores the farming subject, the farm household, and over exaggerates farm productivity and economies of scale in farming. It may be true that the farmland and the agricultural productivity per employee increase when the farm population decreases. However, it must be considered that the migration of farm population brings disequilibrium in farm household economy when the family farm structure is changed by the rapid decrease of young productive farm population, which may ultimately lead to retardation and disorganization of family farms.

The migration of farm population will affect family farms

FIGURE 1. Analytical Frame of Impact of Migration on the Change of the Family Farm Structure.



immediately by diminishing family size. When migration occurs selectively among young people, the people left behind are mostly old people. Thus, the migration will bring the effects of agedness to the farm population, particularly the farm household heads. As the farm household heads are getting old, the farm managerial capability is degraded. Therefore, the farm size will decrease.

When the household economy of a family farm is subsistence, the farm size is closely related to the farm size. According to the family life cycle, the family size becomes biggest when the household head's age reaches around 45 years old, and it decreases after that. If the farm size has a close relationship with the family size, the farm size should decrease as the household head of a farm family is getting old and the family size decreases. The migration will affect family farms to decrease the family size and eventually will lead family farms to decrease its farming size.

On the other hand, as the productive young people migrates, the farm family type will transform gradually from a traditional stem family to a nuclear type family. Since few farm successors remain, a large portion of nuclear type family farms consisting of only aged couple will become single person households. The farm households who could not secure farm successors will eventually be disorganized, bringing a rapid decrease in the number of farm households.

If a large number of farm households disappear, a large acreage of farmland will be offered for rent or sale. However, the demand for farmland of family farms tends to be limited because most of farm household heads are getting old and the family size becomes smaller. Therefore, a large acreage of farmland will remain idle.

IV. The Change of Farm Population and Employment

Farm population in Korea had increased until 1967. However, it began to decrease from 1968 mainly due to the rural to urban migration. During 1965-90, farm population decreased by 3.5 percent annually while the total population increased by 1.6 percent per annum during the same period. The decrease in farm population was slow until the middle of the 1970s. The annual decrease rate of farm population was about 2.4 percent. However, during 1975-80, the annual rate of

decrease in farm population was more than 4 percent. Since then, the annual rate of decrease in farm population has soared, recording 4.8 and 4.9 percent during 1980-85 and 1985-90 respectively. As a result, the farm population decreased from 15,812 thousand in 1965 to 6,661 thousand in 1990, which comprises of 15.5 percent of the total population.

TABLE 2. The Change of Farm Population and Farm Employment

(thousand, %)

	Farm Household	Population		Employment		(B/A)	(D/C)
		Total (A)	Farm (B)	Total (C)	Farm (D)		
1965	2,507	28,705	15,812	8,112	4,538	55.1	55.9
1967	2,587	30,131	16,078	8,717	4,598	53.4	52.8
1970	2,483	32,241	14,422	9,617	4,756	44.7	49.5
1975	2,379	35,281	13,244	11,692	5,041	37.5	43.1
1980	2,155	38,124	10,827	13,683	4,429	28.4	32.4
1985	1,926	40,806	8,521	14,970	3,554	20.9	23.7
1990	1,767	42,869	6,661	18,036	3,152	15.5	17.5
annual rate of change							
1965-67	0.16	2.42	0.83	3.60	0.66		
1968-70	-0.14	2.26	-3.62	3.28	1.13		
1970-75	-0.86	1.80	-1.70	3.91	1.16		
1975-80	-1.98	1.55	-4.03	3.15	-2.59		
1980-85	-2.24	1.36	-4.79	1.80	-4.40		
1985-90	-1.72	0.99	-4.93	3.73	-2.40		
1065-90	-1.40	1.60	-3.46	3.20	-1.46		

Source : *Agricultural Census, MAFF*, Selected Year

Farm employment has also decreased during 1965-90. Farm employment, unlike the farm population, increased steadly until 1976. However, it has decreased rapidly since 1977. During 1980-85, the annual rate of decrease in farm employment recorded 4.4 percent. Since then, the rate of decrease has been slow. Why has the decrease rate of farm employment become slow in the late 1980s, while that of

farm population has been high? It may be explained by the biological change in farm population, which implies that biological resources of migration among farm employees have already been exhausted because the migration has occurred mainly among the productive young people.

While the farm population decreased rapidly during 1965-90, the decrease in the number of farm households was rather slow. This fact may be explained by the characteristics of industrialization and

TABLE 3. The Change of Age Structure in Farm Population

(percent)

	1970	1980	1990
-14	45.2	33.0	20.6
15-19	8.7	12.4	11.0
20-29	9.7	14.7	12.2
30-39	11.3	8.8	9.9
40-49	8.9	12.7	11.8
50-59	6.9	9.9	16.6
60-69	4.4	6.5	11.1
70-	2.6	4.0	6.7

Source : *Agricultural Census,* MAFF, Selected Year

TABLE 4. The Change of Age Structure in Farm Laborforce per Farm Household

(persons, %)

	1970		1990	
	Total	Employed for Over 3 months	Total	Employed for Over 3 months
15-19	0.43(14.6)	0.15(9.3)	0.16(0.6)	0.01(0.4)
20-29	0.53(18.0)	0.29(18.1)	0.27(16.0)	0.12(7.3)
30-39	0.64(21.8)	0.40(24.5)	0.35(20.7)	0.26(15.3)
40-49	0.54(18.4)	0.34(21.1)	0.43(25.4)	0.35(20.8)
50-59	0.43(14.6)	0.28(16.9)	0.62(36.7)	0.52(30.7)
60-	0.37(12.6)	0.16(10.1)	0.57(33.7)	0.43(25.5)
Total	2.94(100.0)	1.62(100.0)	2.40(100.0)	1.69(100.0)

Source : *Agricultural Census,* MAF, Selected Years

migration pattern in Korea. As Korean industrialization has been based on export oriented and strong government leadership, most important industries have been built near large urban centers and port cities. Therefore, jobs created by the industrialization are concentrated at a few metropolitan areas, and the rural young people have to migrate to urban centers to find jobs. The people left behind are old and have less opportunity for nonfarm job employment.

Since the migration of farm population has occurred mainly among the productive young people, the portion of young population aging under 14 years old has decreased rapidly. The ratio of farm population under 14 years old has decreased from 45.2 percent to 20.6 percent during 1970-90. In contrast, the portion of aged population over 60 years old has increased from 7 percent to 17.8 percent during the same period. This change of age structure in farm population eventually brought the change of age structure in farm employment.

Although the family size has decreased from 5.8 to 3.8 persons durng 1970-90, the family members who engage in agriculture in a family farm has decreased from 2.9 to 2.4 persons on an average during the same period (Table 4). In particular, the persons who engage fully in agriculture for more than three months in a year have slightly increased from 1.62 to 1.69 persons during 1970-90. Furthermore, a large portion of laborforce engaging in agriculture has become aged. During 1970-90, the farm employees aging from 20-40 years old have been rapidly decreased while the aged farm employees over 50 years old have substantially increased.

V. Change of Agricultural Productivity and Farm Household Income.

As farm laborforce transferred to the nonfarm sector rapidly, farm mechanization became an issue from the late 1960s. Motor tillers and tractors began to be introduced to farmer's plot since the mid-1960s. As the farm employees decreased rapidly from the late 1970s, the machineries such as rice transplanters and combines were introduced to farm plots to make up for the labor shortage. Has the migration of farm population brought an increase in agricultural productivity and

farm household income?

During 1965-90, value added in the agricultural sector[5] has grown 2.1 percent per annum. Compared to the annual GNP growth rate, which has been almost 8 percent per annum during the same period, the growth rate of the agricultural sector has been relatively low. However, when subdivided by decade, the agricultural sector recorded an annual growth rate more than 4.0 percent during 1965-75. As a result, land productivity increased substantially, recording more than a 4.0 percent annual increase during 1965-75. Labor productivity also recorded an almost 3.0 percent annual increase during the same period, even though the employment in the agricultural sector increased steadily.

The high growth rate in the agricultural sector during 1965-75 was mainly attributable to technology innovation and the government's price supporting policy. Increased application of fertilizer and pesticide became available to agriculture as industrialization proceeded. Infrastructure such as irrigation and land consolidation was expanded rapidly. Effective dissemination of high yielding rice varieties increased rice productivity substantially in the early 1970s.

The growth rate of land productivity and value added in the agricultural sector slowed down since 1975. During 1975-'79, the annual growth rate of value added in the agricultural sector dropped to 2.17 percent. During 1979-'85 and 1985-'90, the value added in the agricultural sector grew only 1.27 and -0.01 percent per annum respectively. By contrast, labor productivity in the agricultural sector increased substantially since the mid-1970s, even though the increase rate slowed during 1985-'90. The growth rate of labor productivity was particularly high during 1975-'85, while the growth rate of land productivity and value added in the agricultural sector were relatively low.

The continuous increase of labor productivity since the mid-1970 was mainly attributable to the decrease in farm employees. During the last 25 years, employment in the agricultural sector decreased by 1.34 percent per annum. Particularly, the decrease in farm employment has accelerated since 1975. Considering the slow

[5] The agricultural sector here includes forestry.

TABLE 5. Land and Labor Productivity

(1985 prices)

	Labor Productivity (thousand won/ha)	Land Productivity (thousand won/ha)	Value Added in Agr. (billion won)
1965	1,173.1	2,359.8	5,323.7
1970	1,362.7	2,820.2	6,480.9
1975	1,580.6	3,291.5	7,967.8
1979	1,880.4	3,711.3	8,691.3
1985	2,638.9	4,104.1	9,378.5
1990	2,878.1	4,301.5	9,071.9
(annual increase rate)			
1965-'70	3.04	3.57	3.93
'70-'75	2.93	3.09	4.13
'75-'79	4.34	2.82	2.17
'79-'85	5.65	1.68	1.27
'85-'90	1.74	0.94	-0.01
'65-'90	3.59	2.40	2.13

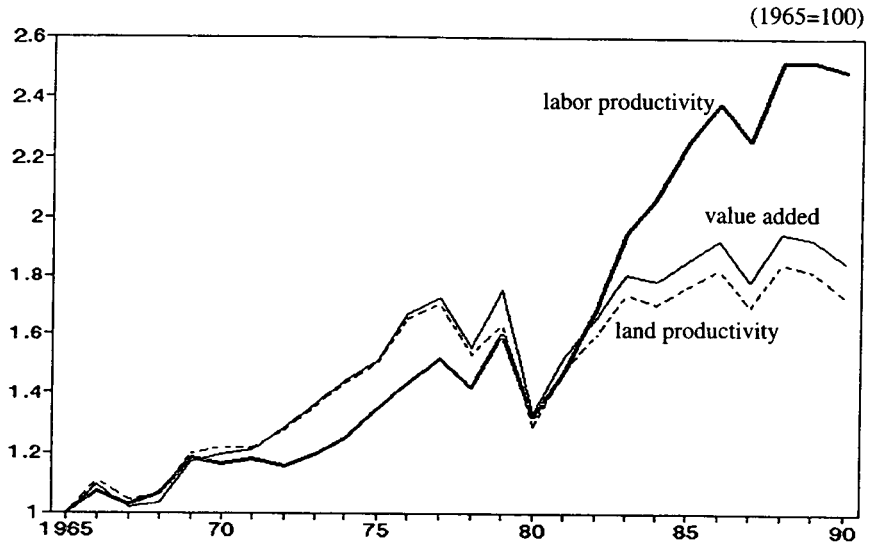
Source : *Major Statistics in Agriculture, Forestry and Fisheries*, MAF, Selected Issues.

growth of value added in agricultural land productivity during 1975-'90, the high growth rate of labor productivity during the period could be explained by the substantial decrease in farm employees.

However, the growth rate of agricultural productivity slowed down since 1989 as in the Figure 2. This may be explained by two factors. One is the unfavorable change of external factor of farm households such as government agricultural policy and the change of global economic environments. The other one is the internal factor of farm households such as the demographic structure of farm population, farm family labor conditions, and the management conditions, has changed unfavorably restricting the growth of agricultural production.

Capital accumulation for family farm operation is one of the reasons restricting the growth of agricultural production. As mentioned before, farm mechanization has been accelerated as the farm laborforce transferred to nonfarm sector. Uprising the price of real estate, particularly the rise in farmland prices increased the

FIGURE 2. The Trends of Real Growth in Agricultural Productivity



capital size in farm operation. Consequently, returns from capital investment became smaller. Under the low level of capital return, the increase in capital accumulation has raised the level of farm household debts. In fact, farm household debt in real terms decreased during 1970-'75 when the value added in the agricultural sector grew rapidly. However, the real farm household debts have increased 22.3 percent per annum during 1979-'90, when there were high rates of capital accumulation in the farm household economy.

Farm household income has increased by 6.1 percent annually during 1965-'90. Compared to the GNP growth, the increase in farm household income was relatively low. Until 1975, farm household income was determined mainly by farm income. Farm income made up 72.3-81.9 percent of total farm household income during 1965-'75. However, this portion has decreased since 1975. In 1990, farm income comprised 56.8 percent of farm household income. Frequent natural disasters, the removal of the import restriction on foreign

TABLE 6. Composition of Farm Household Income

(1,000 won in 1985 prices, %)

	Total income	Farm income	Non-farm Income		
			subtotal	wage	others
1965	1,980.6	1,439.2 (72.7)	541.3 (27.3)	82.6	458.7
1970	2,283.9	1,732.1 (75.8)	551.8 (24.2)	66.9	484.9
1975	3,269.3	2,677.2 (81.9)	592.1 (18.1)	146.1	446.0
1979	4,283.6	2,944.8 (68.8)	1,338.8 (31.2)	252.3	1,086.5
1985	5,736.2	3,698.9 (64.5)	2,037.3 (35.5)	471.7	1,565.6
1990	8,978.7	5,100.9 (56.8)	3,877.8 (43.2)	1,184.4	2,693.4
(annual increase rate)					
1965-'70	2.9	3.8	0.4	-4.2	1.1
'70-'75	7.4	9.1	1.4	15.6	-1.7
'75-'79	6.8	2.4	20.4	13.7	22.3
'79-'85	4.9	3.8	7.0	10.4	6.1
'79-'90	9.0	6.4	12.9	18.4	10.9
'65-'90	6.1	5.1	7.9	10.7	7.1

Source: *Annual Report on Farm Household Economy Survey,* MAF, Selected Issues.

agricultural products, and the withdrawing of price support policy for agricultural products resulted in the low growth of farm income during the period.

On the contrary, non-farm income from various sources such as wage income, transferred income and donations has increased substantially since 1975. Farm household income growth since 1975 was attributable to the increase in non-farm income to some extent. However, non-farm income, particularly the wage income did not rise as much as expected despite the rapid economic development. In 1990, the portion of nonfarm income was 43.2 percent of the total farm household income. Although the wage income has increased 10. 7 percent per annum during 1965-90, the portion of wage income was only 13.2 percent of the total farm household income in 1990. It is hard to say that nonfarm jobs in rural areas have increased substantially as expected in the process of industrialization.

There are several reasons for the scarcity of non-farm job

opportunities in rural areas. Economic development in Korea has been realized through an export-oriented and unbalanced development strategy. Consequently, industrialization has been established mainly in metropolitan areas and major port cities such as the Seoul-Inchon and Pusan-Ulsan-Masan areas. Until a rural industrialization program was introduced in 1985, opportunities for nonfarm jobs in rural areas had been scarce. However, since most young, educated people who have better nonfarm job opportunities left villages for urban centers, the employment of farm population by nonfarm sector became difficult. Considering the demographic change of farm population, the increase in nonfarm income through nonfarm employment of farm family would be limited (Suh et al., 1991).

Although the labor productivity as well as the land productivity has increased substantially, the increase in farm income has been slow, and its portion of the total household income has diminished. Diminishing farm income and the slow increase of nonfarm income, particularly the wage income, would continue to restrict family household income increase in the future. The mass migration of productive young people from farm population would increase the relative poverty for the farm households in rural areas.

VI. The Change of Family Life Cycle and the Size of Farm Family Members

Family size is changed according to the family life cycle. Generally speaking, the family size in a nuclear farm family begins to increase as the married couple begins to have children. And the family size reaches peak when the age of the household head of the family reaches around 45. The family size decreases after that, and finally the family ceases to exist when the married couple dies. Thus, the family life cycle of a nuclear family ends in a generation.

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[6] Korean family system is called a stem family since the family is succeeded by only one son, commonly by the eldest son according to the patrilineal principle. The second son or other sons must leave parents' home after marriage and establish new families to be succeeded by their eldest sons. Therefore, new stem families are created.

However, the family size in a stem family[6] is different from a nuclear family because the family life cycle does not extinct but succeeded by the family household successor, commonly the eldest son of the family. In a stem family, the family size decreases after it reaches peak as it is in a nuclear family. However, the family size ceases to decrease when the family successor gets married and begins to have children, increasing the family size again. Thus, the family life cycle does not end, but makes a recyle.

Stem family is the ideal type in Korea. Thus, the eldest son succeeds the position as well as the right of a household head after his father, while the other sons leave parents after marriage and establish new families nearby their parents' houses. However, the selective migration of farm population occurred during the last 30 years has affected the familly type and tradition to change. As indicated in the Table 7, the nuclear type farm households in rural areas have steadily increased. The ratio of nuclear type family, which includes single, one-generation, two-generation family households[7], in rural areas was 69.6 percent in 1970. It increased to 76.8 percent in 1990. The ratio of stem type family has decreased from 30.4 to 23.1 percent during the same period. However, the distinctive changes among nuclear type family are the increase of single family households consisting of mostly old people, and the increase of one-generation family households with mostly aged couples. In most cases, their children left parents' home to settle down in urban areas. The ratio of single family households in rural areas in 1990 was 10 percent, which was not noticed in 1970. The one-generation family type consisting of aged couple has increased to 14.1 percent in 1990 from 4.7 percent in 1970. In the case of farm family, the ratio of aged couple one-generation family households was 20.3 percent in 1990, which was much higher than the ratio of one-generation family households in rural areas, while the ratio of single family households was lower because the old single family households, in most cases, gave up farming as they have labor shortage and some phychological problems such as loneliness.

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[7] One generation family household refers to the household consisting of only a couple without children while two generation family household refers to the household consisting of a couple and their children.

As the family type has changed from stem to nuclear family and in particular, as the number of single, aged couple and one-generation family households has increased, the family size of family farms has decreased substantially. The national average of the family size of family farms has decreased from 5.8 persons in 1970 to 3.76 persons in 1990. A case study (Kim et al., 1991) shows that the farm family size in the village level is even smaller than the national average (Table 8). It is a common sense that the family size of farm households is bigger than the households in urban areas, but this has been reversed in Korea since 1990.

TABLE 7. The Change of Family Type

(percent)

Family Type	Household in Rural Areas (Myun/Eup)					Farm Household
	1970	1975	1980	1985	1990	1990
Single	-	3.8	5.1	7.5	10.3	5.9
One generation	4.7	4.9	7.2	10.6	14.1	20.3
Two generation	64.9	63.6	62.5	58.9	57.1	50.6
Three generation+	30.4	27.7	24.6	22.3	17.4	23.1
Others	-	-	0.6	0.7	1.1	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source : *Population and Housing Census*, National Statistical Office, Selected Years; The figure of farm household in 1990 comes from a survey of 15,163 farm households conducted by Korea Rural Economics Institute in 1991.

TABLE 8. The Change of Family Size per Household

(persons)

Household	1965	1970	1975	1980	1985	1990
Urban Areas	-	5.1	-	4.5	-	3.78
Farms in Average	6.3	5.8	5.6	5.0	4.4	3.76
Farms in Village	-	-	-	-	-	3.20
National Average	5.8	5.4	5.1	4.6	4.2	3.77

Source : *Agricultural Census*, MAF; *Farm Household Economy Survey*, MAF; *A Survey from* KREI(1991); *Urban Household Survey*, NSO, Selected Years

The increase in aged couples and nuclear type families and the decrease in family size mean the increase of instability of the farm family structure. Thus, the sustainability of family farms becomes weak as the number of single and one-generation family farms increases. This also implies that the size of farm family will decrease rapidly in the near future.

VII. The Decrease of Farm Successors and New Entries of Family Farms

The decrease of farm households in number means that the number of newly established farm households is smaller than the number of extinct farm households. In fact, the number of newly established farm households has decreased rapidly during 1970-90. According to the Agricultural Census of 1970, the number of farm household heads whose age is under 30 was 215,812. It means that there were 215,812 newly established or succeeded farm households after their parents during 1960-70. However, the number reduced to 129,673 in 1980. During 1970-80, newly established or succeeded farm households decreased by 40 percent compared to the previous decade. The situation got worse during 1980-90 with only 36,719 newly established or

TABLE 9. Number of Farm Households by the Age of Household Head

(farm households, %)

	1970	1980	1990
under 30	215,812 (8.7)	129,673 (6.0)	36,719 (2.1)
30-39	657,922 (26.5)	367,123 (17.0)	221,177 (12.5)
40-49	662,953 (26.7)	664,794 (30.9)	372,508 (21.1)
50-59	569,564 (22.9)	555,907 (25.8)	583,964 (33.0)
over 60	377,067 (15.2)	437,576 (20.3)	552,665 (31.3)
Total	2,483,318(100.0)	2,155,073(100.0)	1,767,033(100.0)
Ratio of farm Successor(%)	n.a	43.3	16.4

Source : *Agricultural Census*, MAF, Selected Years

TABLE 10. The Change of Number of Family Farms by Reason
- the Case of S Village -

	Farms Succeeded	Increase		Decrease		Total no. of households at the end of period
		in-migration	newly established	out-migration	extincted	
1945-55	7	3	2	3	-	31
1955-65	5	1	2	3	-	31
1965-75	2	2	5	1	2	35
subtotal	14	6	9	7	2	
1975-85	5	3	1	5	-	34
1985-92	0	2	0	10	-	26
Total	19	11	10	22	2	

Source : Choe and Oh, 1992

succeeded farm households. The number of newly established or succeeded farm households decreased by 71.7 percent compared to the previous decades.

There are two ways for being a farm household in Korea: one is succeeding a farm household after his farther; the other is becoming a new entry by establishing a new farm through marriage and separation from his father's farm or entering into farming directly from the nonfarm sector. According to the agricultural census, the ratio of designating farm successor has decreased rapidly since 1980. The agricultural census shows that the ratio of designating farm successors has decreased from 43.3 percent in 1980 to 16.4 percent in 1990. A farm household survey (Kim and Chung, 1991) shows that in 1990, among the farms with household heads of over 50 years old, 12. 6 percent of farms had successors. It means that 87.4 percent of farm households whose household heads' age is over 50 do not have farm successors and thus, the farms are possibly expected to become extinct in the near future.

In the case of a village in Chungnam province, the farm households increased mainly through estabilshing new farm households through marriage and separation from their parents until 1975. The out-migration and in-migration of the farm families were

almost equal in number. However, since 1975, the number of farms succeeding and newly established has decreased rapidly, while the farm households out-migrated has increased sharply.

Family farms succeeding and newly established through marriage are the particularity of Korean family farms, which based on the stem family system. However, this particularity has been fading because of the migration of the farm population. The increase in the absence of family farm successors and the rapid decrease of newly establishing family farms will resulted in a decrease in the number of family farms in a relatively short period in Korea.

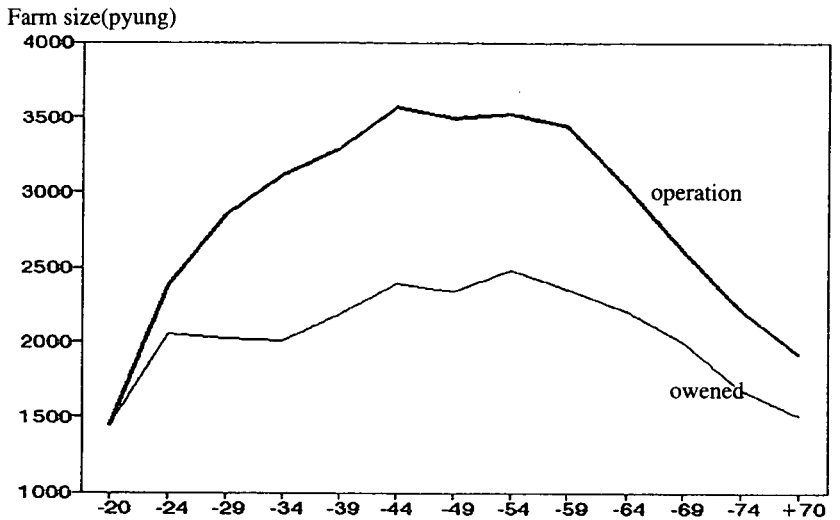
VIII. The Change of Farm Size

It is a primary assumption that the family farm size should increase as the number of family farms decreases. Has the family farm size increased as the number of farm households has decreased? During 1970-'80 and 1980-'90, the number of family farms decreased by 11.9 and 16.8 percent respectively. The family farm size, on the other hand, increased by 5.5 and 12.0 percent during the same period. Although the average farm size of family farms increased steadily during 1970-'90, the average acreage of family farms increased from 87.7a to 104.0a during the same period. Should the family farm size increase as the number of family farms decreases further?

If the external conditions remain steady, the internal conditions affecting the farm size must depend on such factors as the managerial capability of farm household heads, the size of family laborforce, the availability of capital, and the size of family household expenditures... etc. When a family farm is market-oriented, the managerial capability of the farm household head and the capital availability are the important factors affecting the farm size decision. However, if the family farms remain at the stage of subsistence economy, then the size of family laborforce and the family expenditures have priority to the farm size decision for the family living.

Farm size of a family farm in Korea has a close positive relationship with the size of family members. The family farm size begins to increase when the family farm is newly established, and reaches peak when the age of household head reaches around 40-44.

FIGURE 3. The Change of Farm Size by the Change of Age of the Farm Household Head

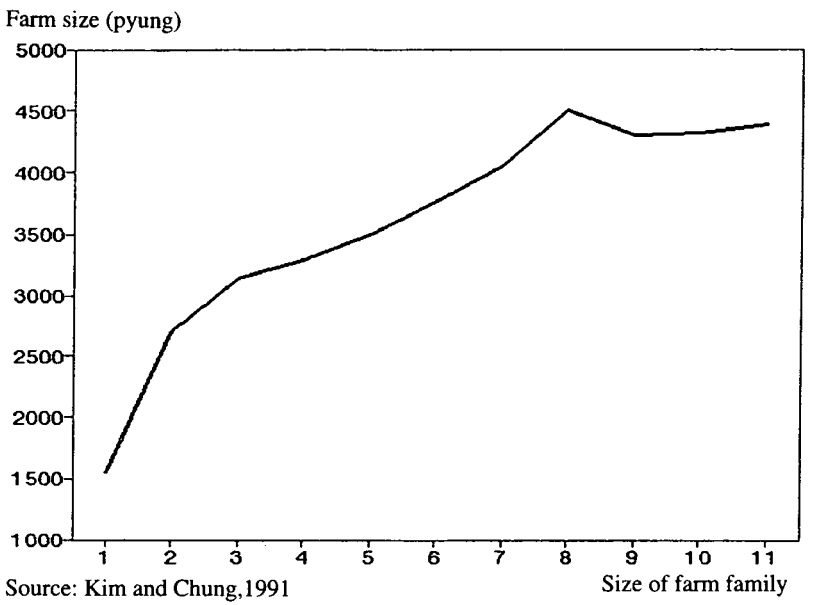


Source: Kim and Chung, 1991

FIGURE 4. The Change of Family Size by the Change of Age of the Farm Household Head

Source: Kim and Chung, 1991

FIGURE 5. The Change of Farm Size by Family Size



Source: Kim and Chung,1991

The farm size is matained until around the age of 60, but it begins to decrease rapidly after the age of 60.

On the other hand, the family size begins to increase right after a couple establishes a farm household. The number of family members reaches peak when the age of household head reaches around 40-44. Since then, the family size decreases steadily. The correlationship between the two variables, the farm size and the family size in a family farm, is 0.96. This means that family size is an important determinant factor for the farm size decision of family farms in Korea. From the above fact, two implications can be drawn: one is that family farms in Korea are based on the subsistence economy, and other one is that the farm size accordingly will be shrink as the household head of a family farm is getting old and the family size becomes smaller.

In fact, the agedness of the household head in a family farm is serious in Korea. Table 11 shows the change in proportion of the age group of the family farm household heads. In 1970, the age group of 35-39 accounted for the highest proportion, and then the highest

TABLE 11. The Change of Age Group Proportion of the Farm Household Head

(percent)

	1970	1975	1980	1985	1990
- 20	0.9	0.6	-	-	-
20 - 24	2.2	2.5	1.9	0.9	0.2
25 - 29	5.6	5.7	4.1	3.5	1.2
30 - 34	12.0	9.4	7.1	6.0	4.5
35 - 39	14.5	14.4	10.0	8.4	7.2
40 - 44	13.2	15.3	15.1	10.8	8.4
45 - 49	13.5	13.2	15.8	15.7	11.0
50 - 54	12.3	12.8	13.3	16.6	16.8
55 - 59	10.6	11.1	12.4	13.6	17.8
60 - 64	7.8	8.0	10.0	13.1	13.5
65 - 69	4.2	4.6	6.2	7.5	10.0
70 -	3.2	2.4	3.3	3.9	9.4

Source : *Agricultural Census*, MAF, Selected Years

proportion age group has increased by 5 years in every 5 years. Thus, in 1990, the highest proportioned age group was 55-59. If this trend continues, the group of those aged 65-69 will occupy the highest proportion in the year 2000. Accordingly, family size will be smaller than that of 1990, and the farm size will shrink as family size decreases.

However, the farm size may not decrease in absolute terms. If the farm size responds to the family household expenditure, the farm size may increase according to the increase in farm family living standard even though the family size becomes smaller. During 1980-90, the farm household expenditure of the family size of four increased by 1.27 percent annually in real terms, while GNP grew 9. 16 percent per annum.

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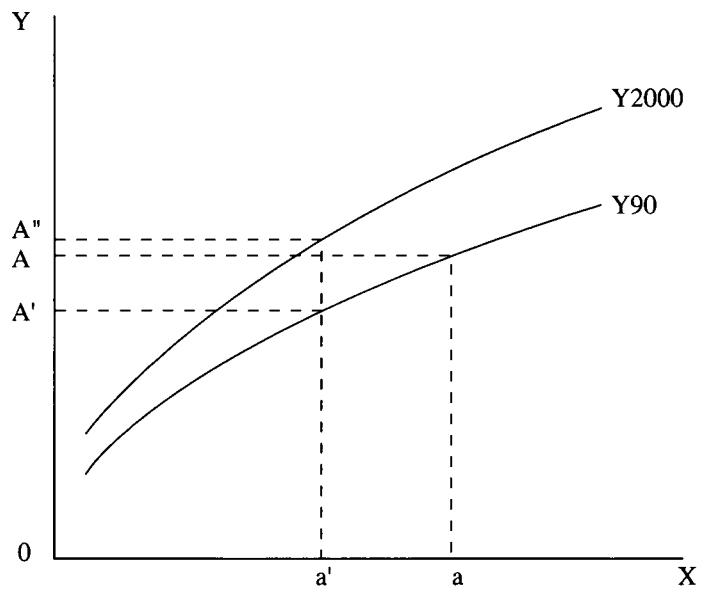
[8] The function Y_{90} is measured as $Y_{90} = e^{7.4391} \cdot f^{0.4063}$, when f is the average family size of family farms. The function $Y_{2000} = e^{7.6356} \cdot f^{0.4051}$ is measured with the assumption that GNP will grow annually by 8 per cent during 1990-2000.

From Figure 5, the function of Y_{90}^{8} could be identified as in Figure 6. From the fuction, the average farm size "A" in the Y intercept in 1990 could be identified by the "a," the average farm family size in the X intercept. Thus, if the family size decreases from a to a' in the X intercept, the farm size must decrease from A to A'. However, if the family size decreases from a to a' in the year 2000, the farm size is not A', but A" because the function shifts from Y_{90} to Y_{2000}. Therefore, even though the family size will decrease in the year 2000, the average farm size will increase as much as the farm household expenditure function shifts.

FIGURE 6. Conceptual Model of the Change of Family Farm Size by the Change of Family Size



From the above conceptual frame, the farm size of A" in the year 2000, when the family size is a', can be calculated. Chung (1991) estimated the average family farm size when the average family size is assumed to be 2.83 and the number of family farms is 1,264 thousand in the year 2000. Under this assumption, the average family farm size shall be 115a and the total farmland acreage under cultivation will be around 1,450 thousand hectare in the year 2000. This means that the family farm size will increase by 10.6 percent during the next decade, while the total number of family farm household will decrease by 28.5 percent. Furthermore, Table 12 shows that the farm population will decrease by 45.9 percent and the total farmland under cultivation will decrease by 26.9 percent in the year 2000 when they are compared to those of 1990.

TABLE 12. The Change of Farm Size and the Number of Farm Households

(household, percent)

	1970 (A)	1980 (B)	1990 (C)	2000* (D)	B/A	C/B	D/C
Farm households(000)	2,415	2,127	1,767	1,264	88.1	83.1	71.5
Farm population(000)	15,812	10,827	6,610	3,577	68.5	61.5	54.1
per farm household							
- Family size	5.97	5.37	3.76	2.83	89.9	70.0	75.3
- Acreage(a)	87.7	92.5	104.0	115.0	105.5	112.4	110.6
Total farmland(000ha)	2,136	1,984	1,823	1,450	92.9	91.9	73.1

* *Estimation*
Source : Chung, 1991

IX. Concluding Remarks

During the process of industrialization, the migration of farm population has been considered desirable for the growth of industry and agriculture. However, the selective migration of farm population generated the sustainability problem of family farms in Korea although agricultural productivity has increased substantially. The

migration of productive young farm population has brought changes in the age structure of the farm population, the agedness of farm household heads, family type, family size, and the family farm succession. These changes will eventually lead family farm to reduce the farm size in relative terms and discontinuity. Thus, a large acreage of farmland will be disposed from family farms in the near future. But the large portion of the farmland disposed by family farms would not be cultivated by other family farms since the capacity of family farms for increasing farm size is narrow. Therefore, most of the farmland disposed by family farms will be either idle or purchased by non-family farm entities in the future.

The structural change of family farms, particularly the agedness of family farm household heads, the decrease in family size and farm laborforce, and degraded farming capability will eventually affect the farm production negatively, although the agricultural labor productivity has increased substantially during 1975-'90. The decreasing trend of agricultural productivity growth rate revealed since 1989 is noticeable from this point of view. This trend would continue unless there is a new equilibrium in family farm.

At the early stage of industrialization in Korea, the industrial sector was weak. Nobody was sure that such industries as steel, automobile, electronics, and computer in Korea are competitive in the world market in the 1960s. However, these industries have grown fast as internationally competitive industries in Korea under government's favorable fostering policies. The Korean government fostered these industries by providing low-interest public loans, exemption of tariffs, protection from outside competition, and through building social infrastructure during the last three decades.

In the process of industrialization, agriculture played a role of supplying food and laborforce for industrial development. Therefore, the policy for food production has been emphasized throughout the period, while family farms disposed laborforce continuously. Eventually the struture of family farms became weak, and the income gap and other infrastructure building between the rural and urban sector became wider. From the policy side, family farms as a farm business have been ignored since they are considered the subject to be diminished. This could be proved by the fact that the migration has been proceeded from all strata in the farm sector, and as a result,

family farms in all classes face a problem of sustainability.

Migration of farm population in Korea, which occurred mainly among the young productive population has contributed to increase in agricultural productivity to a certain extent. However, in other dimension, its impacts affected the growth of family farm as well as the growth of agriculture negatively. The assumption that the family farm size will increase as the number of family farms decreases is too naive. Achieving economy of scale in Korean family farms through the migration of farm population and the decrease in the number of family farms could be a long term policy goal. But under the condition of subsistence farm economy and selective migration, it can not be achieved by only migration and decreasing the number of family farms unless there are some appropriate agricultural policies fostering family farms as competitive market-oriented farm business organizations, as it has been done in the nonfarm sector for industrial development during the last three decades.

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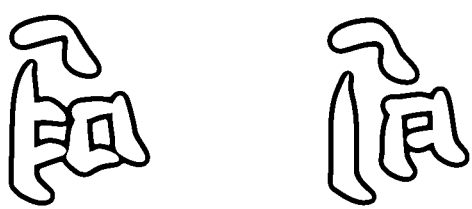

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