CHAPTER

02

Agricultural Resources and Structure

CHAPTER 02

Agricultural Resources and Structure

1. Farmland

Overview

As of the end of 2018, the total national area is 10 million and 38,000 ha. The ratio of farmland is 15.9% (1.59 million ha). The rice paddies amount to 844,000 ha, while the dry fields 751,000 ha. Classifying farmland based on its designation for agricultural development, the land in agricultural development areas is 47.2% or 778,000 ha. The other not in agricultural development areas is 818,000 ha (Table 2-1). While the total farmland area has been on the decrease since the 1970s, the area designated to agricultural development regions increased from 1992 to 2005. However, it turned to decrease after 2005 and saw a significant drop due to the end of the designation.

The arable land per capita is 0.03 ha, much smaller than advanced countries (the U.S. 0.5 ha, France 0.3 ha, Germany 0.2 ha), resulting in a low food self-sufficiency rate. Rice, Korea's major staple grain, is almost self-sufficient due to the government's investment in production base rearrangement and a decrease in rice consumption. However, other grains' self-sufficiency ratios are 21.7% as of 2018. Although food self-sufficiency is low, a significant amount of farmland

Table 2-1 State of farmland in agricultural development areas

(in thousands ha, %)

Classification		2005	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total farmland area (A)		1,824	1,715	1,698	1,730	1,711	1,691	1,679	1,644	1,621	1,596
Ratio (B/A) of farmlands in agricultural development areas (B)		919 50.4	807 47.1	807 47.5	809 46.8	808 47.2	811 48.0	810 48.2	780 47.4	777 47.9	778 48.7
Area	Agricultural development	792	751	751	753	752	755	754	705	700	698
	Agricultural protection	127	56	56	56	56	56	56	75	77	80
Item	Rice paddy	771	710	710	712	711	714	713	679	679	682
	Dry field	148	97	97	97	97	97	97	101	98	96

Source: MAFRA, 2019, *The Statistics on Agricultural and Livestock Products*.

with bad farming conditions has been fallow. Around 60,000-ha land becomes fallow every year and unusable any longer.

Changes in Agrarian System

Article 3 of the Farmland Act specifies as follows: "Since farmland is the foundation necessary for food supply to the nation and for preservation of the environment of national land, and is the limited valuable resources influencing the harmonious development of agriculture and national economy, it shall be carefully preserved and suitably managed for public welfare. The exercise of the rights for the farmland shall be accompanied by the necessary restrictions and obligations." The law also states that "the farmland shall be owned and used enhancement of the productivity of agriculture, and shall not become the object of speculation." Specifically, the qualification certificates for the acquisition of farmland are issued so that land acquisition is allowed to people qualified for

ownership through screening. If the acquired land is used for other purposes rather than farming, its disposition shall be ordered, and a charge for compelling the execution shall be imposed. In other words, the owner farming system following the land-to-the-tiller principle is the basis of land ownership and usage.

The farmland ownership and use framework was established through the land reform in 1949 based on the Farmland Reform Act. Since then, the framework has served as a basis for the farmland system. The same act intended to liquidate harmful effects from the past landlord system and create an owner farming system to build a stable social base. The government purchased land from landlords and distributed 3 ha of land to each farmer for smallholding. Non-farmers' land acquisition and the ownership of more than 3 ha were restricted. Besides, land acquisition was restricted through land transaction certification. The upper limit of farmland ownership and the land transaction certification have been in force until now.

Urbanization and industrialization in the late 1960s caused the diversion of farmland usage. Amid the global oil crisis and food shortages in the 1970s, the government enacted the Farmland Preservation and Utilization Act in 1972 to prevent farmland from being used for non-farming purposes. The law's core was to designate land that needs strong protections, especially rice paddies, as absolute farmland. The other was named as relative land for selective protection. Besides, landowners who intended to divert had to earn permission and paid the cost for substitute land creation to the Farmland Management fund. The government at the time was more eager for land preservation than any other.

However, it was hard to abide by the land-to-the-tillers principle as more non-farmers came to own farmland through inheritance or other reasons. Also, land prices were relatively high compared with farming profitability. There were

opinions for allowing land lease for improving the agricultural structure. Finally, the government enacted the Farmland Lend-Lease Management Act in 1986.[1)]

In the late 1980s, there were discussions for the broad opening of agricultural markets. As a response, it was necessary to develop competitive agricultural corporations. The government enacted the Act on the Special Measures for Development of Agricultural and Fishing Villages in 1990 to allow agricultural corporations to own farmland. As the Farmland Reform Act established in 1949 allowed smallholders to own land, permitting corporations' land ownership was a significant change. The previous farmland conservation system, which was introduced in 1972 to designate absolute and relative land lots, was abolished. Instead, the government introduced a new approach to set agricultural development regions. In other words, the previous system was based on each land piece, but the new principle categorized regions. To respond flexibly to market opening, the government relieved regulations on diversion and changed the upper limit of ownership from 3 ha to 10 ha. Besides, it consolidated the different laws, including the Farmland Reform Act (1949), the Famland Preservation and Utilization Act (1972), the Farmland Lend-lease Management Act (1986), and the Act on the Special Measures for Development of Agricultural and Fishing Villages (1990) to make a comprehensive regulatory framework. So the Farmland Act, established in 1996, is yet in force.

Although the Farmland Act strictly abides by the land-to-the-tillers principle, land ownership regulations have relaxed amid social and economic changes. The revised Farmland Act in 2003 allowed non-farmers to own land of smaller than 0.1 ha for purposes, such as weekend farms. Along with introducing farmland banking in 2005, non-farmers were permitted to own land without

1) However, absentee landowners' strong objection delayed the execution of the law.

an upper limit if the acquired land was commissioned for long-term lease. Such a regulatory relief implied a partial collapse in the strict ownership restriction. The scope of agricultural corporative bodies' land ownership was expanded, and consequently, incorporated firms were permitted to own land. The 3-ha upper limit based on the Farmland Reform Act increased to 10 ha in the agricultural development region in 1993 (up to 20 ha when approved by the mayor/ county governor). In 1999, the upper limit in the agricultural development region was abolished. The upper limit outside of the agricultural development region was expanded to 5 ha in 1999. However, the regulation was removed entirely in five decades in 2002.

Current Farmland System's Composition and Framework

Although different farmland laws were consolidated into the Farmland Act, the farmland system is supported by various regulations (Table 2-2). In principle, the Farmland Act specifies land ownership, use, and preservation. However, they are also covered in the Constitution, the highest law in Korea, and other various laws, such as the Framework Act on Agriculture, Rural Community, and Food Industry (the Framework Act on Agriculture), the Act on the Planning and Utilization of the National Territory (the National Territory Act), and the Rearrangement of Agricultural and Fishing Villages Act (the Rearrangement Act). Therefore, it is impossible to make one comprehensive legal framework for the farmland system. Also, it is not desirable to see land from a fragmented perspective ignoring its multi-sided characteristics.

To sum up, the Constitution and the Framework Act on Agriculture, Rural Community, and Food Industry specify basic ideas and principles concerning farmland. On the other hand, the Farmland Act speculates regulatory vehicles to

Table 2-2 Major acts on the farmland system

Category	Farmland Act	Constitution	Framework Act on Agriculture	National Territory Act	Rearrangement Act	Others
Ownership	○	○	○			
Use	○	○	○			
Preservation	○	○	○	○		△
Diversion	○	○		○		△
Rearrangement	△		○		○	△
Formation					○	

Note: The circle ("○") includes specific regulations. The triangle ("△") partially covers related regulations.

materialize such basic concepts and principles.

As previously discussed, the Farmland Act defines land ownership as follows: "The farmland shall not be owned by any person unless he uses or is going to use it for his own agricultural management." Although farmers and agricultural corporations are qualified to own land, non-farmers can own land through inheritance or for non-farming purposes, such as weekend farms and pick-your-own farms. Land lease and entrusted management are allowed following related acts. The Farmland Act permits the lease of land owned through inheritance and migration. Its revision in 2005 gave the Korea Rural Community Corporation the function of farmland banking. Through the system, landowners can entrust long-term land lease to the organization. As a result, the farmland banking system expanded the permissible scope for land lease.

Concerning land preservation, the agricultural development zoning is in place for protecting farmland rearranged or clustered in large areas. The system is to secure high-quality land for productivity improvement. The designated regions gain investments for renovation so that they will be preserved for agricultural production. Besides, their diversion except for agricultural facilities or infrastructures is strictly restricted. On the other hand, land use outside of

the agricultural development areas is flexible for non-farming purposes, as the government relaxed the regulation.

Farmland Use and Diversion

While the number of farm households dropped sharply, farmland areas diminished at a slow speed. As a result, the farmland area per household expanded: 0.73 ha in 1970, 1.19 ha in 1990, 1.37 ha in 2000, 1.46 ha in 2010, and 1.56 ha in 2018. Nevertheless, the land size per household in Korea is significantly smaller than the U.S. and European countries, including France and Germany. Therefore, the government needs to endeavor to expand the land per household.

The composition of farmland size by household changed remarkably around 1990. From 1965 to 1990, the number of farmers with small and large farming areas continuously decreased, while that of farmers with mid-sized areas increased. However, after the 1990s, the ratio of the farmers with 0.5 ~ 3.0 ha dropped, while the shares of farmers with less than 0.5 ha or more than 3 ha rose, widening the gap between petty and large-scale farmers (Table 2-3). Although the average land size per household has slowly increased, the ratio of large-scale farm households has risen sharply. The proportion of farmers with 3 ha or larger expanded from 4.7% in 1995 to 8.2% in 2015.

Although the Farmland Act prohibits land lease in principle, the ratio of leased land has increased continuously: 17.8% in 1970, 37.4% in 1990, 47.9% in 2010, and 51.4% in 2017.[2)]

2) The percentage of tenant farm households in 2017 was 56.4%. Refer to the survey on land lease by the Statistics Korea.

Table 2-3 Number (share) of farm households by land size

Category	Less than 0.5 ha	0.5 ~ 1 ha	1 ~ 2 ha	2 ~ 3 ha	3 ha or bigger	Total
1995	456,900 (30.4)	432,107 (28.8)	417,960 (27.9)	123,333 (8.2)	70,445 (4.7)	1,500,745 (100.0)
2000	454,775 (32.9)	378,655 (27.4)	351,534 (25.4)	113,790 (8.2)	84,714 (6.1)	1,383,468 (100.)
2005	474,832 (37.3)	330,651 (26.0)	280,685 (22.1)	93,295 (7.3)	93,445 (7.3)	1,272,908 (100.0)
2010	486,213 (41.3)	287,695 (24.4)	228,540 (19.4)	78,240 (6.7)	96,630 (8.2)	1,177,318 (100.0)
2015	486,234 (45.1)	255,365 (23.7)	185,111 (17.2)	62,635 (5.8)	88,695 (8.2)	1,078,040 (100.0)

Source: Statistics Korea.

Land lease increased mainly because of an increase in non-farmers' land ownership through migration or inheritance. Also, farmers expand their cultivation size by leasing land instead of purchasing high-priced land.

Total land increased continuously, starting from the 1950s, thanks to reclamation. However, farmland diversion for urbanization and industrialization shrank the whole land after the 1970s. Along with high economic growth, the population grew. Industrialization and urbanization required more housing, commercial areas, and public facilities, resulting in farmland diversion. Besides, the share of fallow land continued to rise due to bad farming conditions. As a result, total land diminished from 2.19 ha in 1980 to 1.71 ha in 2010 and 1.59 ha in 2018. The ratio of fallow land is 3 to 4 times bigger than that of diverted land. The main reason for no cultivation is insufficient labor force and infrastructure. Recently, agricultural market opening worsens farming conditions and causes the rate of fallow land to rise.

Concerning land diversion, the problem is the land in the agricultural development region is also diverted. In particular, in the mid-2000s, a big chunk

Table 2-4 Fallow land and diversion area changes

(in thousands ha)

	1980	1985	1990	1995	2000	2005	2010	2015	2018
Cultivation area	2,196	2,144	2,109	1,985	1,889	1,824	1,715	1,679	1,596
Fallow area	n.a.	20.2	40.4	64.6	16.8	44.2	50.5	40.4	61.0
Diversion area	1.0	2.1	10.6	16.3	9.9	15.7	16.4	12.3	16.3

Source: MAFRA, 2019, *Key Statistics of Agriculture, Food, and Rural Affairs*.

of land in the agricultural development region was diverted for the construction of innovative cities. The trend of land diversion purposes shows that public facilities was the largest in general. On the other hand, the ratio of agricultural facilities was small except for the first half of the 1990s and the mid-2000s. In the early 1990s, the regulation on land diversion in the agricultural sector was significantly relaxed. As a result, large-size farming increased and land diversion for agriculture also expanded. However, the diversion ratio for farming and fishing facilities in 2018 posted 3.4% (Table 2-5). The low figure was partly because of the revised Farmland Act in 2007, which allowed land use for cattle sheds and other related facilities without approval. However, diversion purposes have changed considerably due to changes in social and economic conditions. In particular, new diversion types that do not belong to the existing categories have increased significantly-taking 44.5% in 2018.

Table 2-5 Land diversion by purpose

(in ha)

Year	Diverted area in total	Public facilities	Housing	Mining facilities	Farming & fishing facilities	Others
1980	975 (100)	289 (29.6)	264 (27.1)	125 (12.8)	30 (3.1)	267 (27.4)
1985	2,122 (100)	1,327 (62.5)	296 (13.9)	200 (9.4)	50 (2.4)	249 (11.7)
1990	10,593 (100)	4,474 (42.2)	2,229 (21.0)	2,415 (22.8)	593 (5.6)	882 (8.3)
1995	16,295 (100)	5,252 (32.2)	2,352 (14.4)	1,675 (10.3)	4,687 (28.8)	2,313 (14.2)
2000	9,883 (100)	4,059 (41.1)	1,742 (17.6)	1,142 (11.6)	1,581 (6.0)	1,359 (13.8)
2005	15,659 (100)	7,396 (47.2)	2,340 (14.9)	862 (5.5)	2,245 (14.3)	2,816 (18.0)
2010	18,732 (100)	7,603 (45.9)	4,378 (13.3)	2,766 (13.7)	768 (4.9)	3,217 (22.2)
2015	12,303 (100)	4,648 (37.8)	2,706 (22.0)	1,401 (11.4)	617 (5.0)	2,931 (23.8)
2018	16,303 (100)	4,278 (26.2)	2,315 (14.2)	1,847 (11.3)	547 (3.4)	7,316 (44.9)

Source: MAFRA, 2019, *Key Statistics of Agriculture, Food, and Rural Affairs*.

Implementation of Land Securitization

The land securitization program to improve the agricultural structure through farm holders' business size increase is composed of the farm-scale expansion project and the land banking system. The farm-scale expansion project kicked off in July 1990 to save production costs and raise competitiveness through the land transaction, long-term lease, and subdivision or combination. Afterward, project targets and subsidy conditions were changed. In December 2004, its direction changed to nurture 70,000 rice farming households with around 6 ha until 2013 to share half of the entire rice cultivation area (420,000 ha). From 1990 to 2013, the project provided KRW 6.8 trillion of loans and expanded 167,000-

ha land. As a result, the rice farming size per household expanded from 2.5 ha in 1995 to 5.9 ha in 2013.

The land banking program targeted to utilize farmland efficiently and stabilize farmers' income through land securitization. In fact, land lease entrusting and land transaction contributed to securitizing land. Land lease entrusting is a program to lease the entrusted land to rice farmers for a long-term period. The leasable land consists of the land for farming and facilities attached. The lease period is more than five years, and the land bank decides the rent fee through negotiations with the tenant. The bank pays 5% of the rental fee to the leaseholder. Besides, in the case of entrusting for more than eight years, 10% of the transfer income tax is saved. As the leaseholder has to pay the commission, the land banking program is unfavorable compared with the lease plan in the land securitization program. However, landowners who cannot cultivate rice use the program as a way to lease land legally. The land purchase and stocking program aims to minimize damages to farmers from dropping land prices due to a rise in land sales and a reduction in the number of farm households. The program purchases land in the agricultural development region from retiring or migrating farmers. In principle, the purchased land is saved for long-term lease to rice farmers, start-up farmers migrated from cities. In principle, the lease period is five years and renewable.

Outlook and Tasks

The farming conditions worsened, and fallow land increased due to agricultural market opening. The trend is expected to continue and the farmland area to diminish. Also, relaxed regulations on land ownership and use will increase non-farmers' land ownership and lease. The government

needs to continuously endeavor to expand the land size per household to raise competitiveness. A practical way to achieve the goal is increasing land lease.

In the conditions described above, the challenges to tackle are as follows: First, although the Constitution and the Farmland Act follow the land-to-the-tillers principle, non-farmers' land ownership and land lease have increased in reality. Therefore, to resolve the current farmland system's fundamental issues, there should be a shift from the current ownership approach to a utilization approach. In other words, while ownership regulations are relieved, land diversion should be tightly regulated. It is impossible to shift to the utilization approach without substantial restrictions on land diversion.

Second, as the grain self-sufficiency is lower than 30% and fallow land expands, the government has to seek land preservation measures for stable food supply. The public's agreement on land preservation is necessary, and ways to secure land in a food crisis and manage fallow land should be in place.

Third, as overall management, including land transaction and lease, is not well in operation, the government should set up an organization to improve the agricultural structure and manage land use and preservation through land securitization. The work scope of the new organization should include: i) registering land transaction and lease, ii) promoting land securitization and expansion, iii) managing land use plans, iv) managing preserved land, v) tracking land information.

Fourth, spatial management and the prevention of reckless development become primary targets amid the emphasis on rural areas' plural functions. Rural amenity resources disappear due to buildings placed in rural landscapes, livestock facilities, and various facilities scattered without harmony. As this problem is related to land diversion and space management, the government has to seek ways to manage rural spaces through comprehensive measures. In

other words, it has to prepare thorough plans before development to prevent reckless development.

References

Chae Miok et al, 2007, "Land policy directions and implementation plans (II)," Korea Research Institute for Human Settlements.

Kim Hongsang et al, 2011, "Ways to land banking amid changes in rural conditions," KREI.

Kim Soosuk, 2011, "Farmland disposition order and challenges to tackle," KREI.

Kim Soosuk et al., 2008, "Ways to revise the farmland system amid social and economic changes (Year 1 of 2)," KREI.

Kim Soosuk et al., 2009, "Ways to revise the farmland system amid social and economic changes (Year 2 of 2)," KREI.

Kim Soosuk et al., 2016, "The study on efficient land use through the revision of land banking," KREI.

Kim Sungho et al., 1984, "Research on the farmland system and land preservation," KREI.

Park Seokdoo et al., 2004, "Directions for the revision of the farmland system." Journal of Agricultural Policy Research. Vol 17. KREI.

MAFRA, 2019, *Key statistics of Agriculture, Food, and Rural Affairs*.

KREI, 1999, *50-Year History of Korea Agricultural Policy*. Vol 1. MAFRA.

2. Agricultural Structure

Reason for Changes in Agricultural Structure

In general, the share of agriculture in the gross domestic production (GDP) and in employment tends to decrease along with economic growth. Korean agriculture was not an exception but the pace of agriculture's decline in GDP and employment was unprecedentedly rapid (Table 2-6). The share of farming and fishing in GDP shrank from 14.3% in 1980 to 7.6% in 1990, 3.9% in 2000, and 1.7% in 2019. The percentage of employment in the same period decreased from 34.0% to 17.9%, 10.7%, and 5.1%.

As the production vlue in agriculture shank, "the problem of low income in agriculture compared with other industries" became serious (Lee 2015; timmer 2007: 8-9), and generation renewal in agriculture was delayed. In other words, Korean farmers aged and became poor rapidly. Let us explore the changes.

First, the number of farm households and the farming population declined 1.8% and 3.7%, respectively, on average from 1970 to 2018 (Figure 2-1). During the same period, the number of full-time farmworkers[3] and the number of

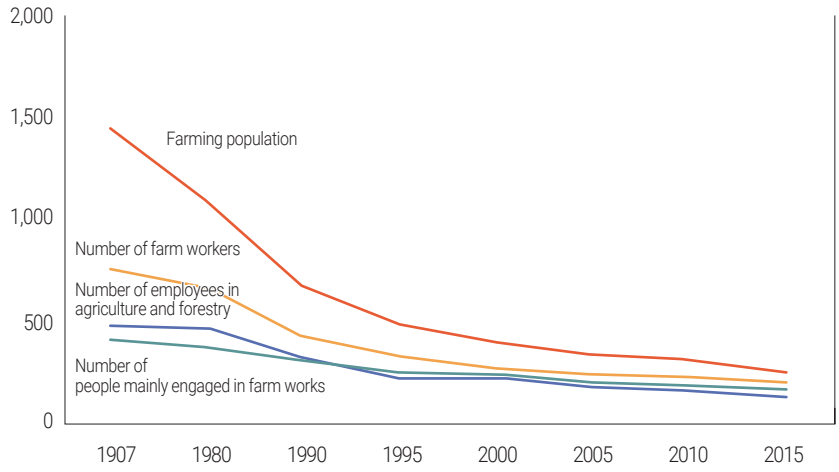
Table 2-6 Agriculture's share in GDP in Korea and other countries

Category	Year when agriculture's share to GDP falls to 40%	Year when agriculture's share to GDP falls to 7%	Period taken (years)
Britain	1788	1901	113
Holland	approx. 1800	1965	165
U.S.	1854	1950	96
France	1878	1972	94
Japan	1896	1969	73
Korea	1965	1991	26

Source: Lee Jeonghwan, 1997: 26.

3) It refers to people aged 15 or older of farm household members engaged in farm works (almost) full-time.

Figure 2-1 Countries in free trade agreements with Korea (as of February 2020)



Note: 1) The starting age for the population of full-time farm workers is 14 years old in 1970 and 1980, and 15 years old in 1990 and afterward.

2) The number of employees in agriculture and forestry is calculated based on the standard industrial classification, each year.

Source: Statistics Korea each year for farming population, population of farm workers, population of full-time farm workers, The Census of Agriculture, Forestry, and Fisheries. Raw data; the number of employees in agriculture and forestry: Statistics Korea, each year. *The Economically Active Population Survey*.

employees in agriculture and forestry decreased 2.9% on average. Although non-farming sectors needed more labor force during the economic growth period, most jobs were taken by young people (Lee 2015). Young farmers migrated to cities, while aged farmers stayed for farm works.

As a result, the farming population has been aging. The comparison of age groups shows the change (Table 2-7). As on-farm income was not sufficient, young people left for cities. Family farm succession was no longer possible in rural areas. The number of family farms with young successors was 109,863 households (9.6% of the total) on average from 2011 to 2014 (Statistics Korea, *The Census of Agricultural sectors, Forestry, and Fisheries*).

Table 2-7 Farming population trends by age group (1970~2015)

(in ten thousands, %)

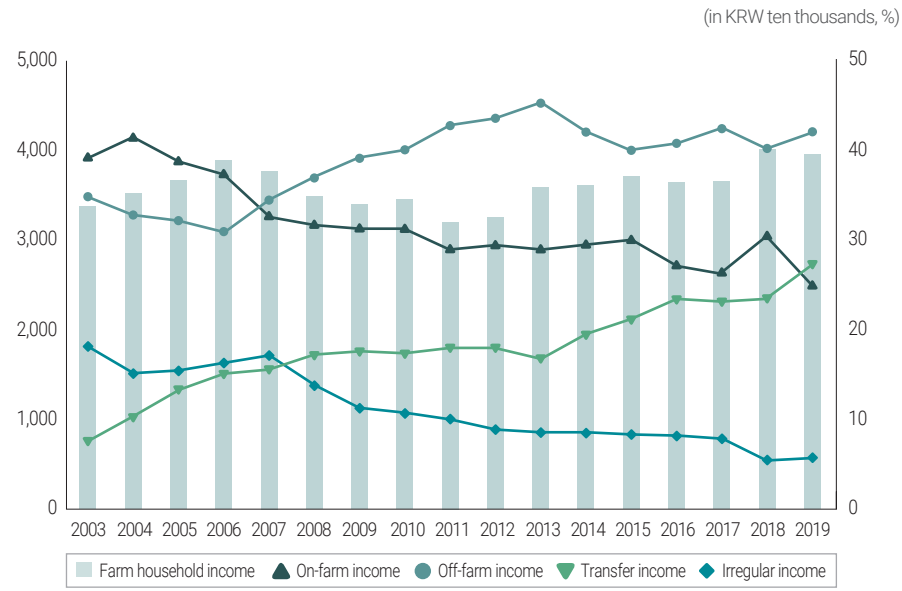
Year	Younger than 30	30- 39	40- 49	50- 59	60- 69	70 or older	Share of 60 or older	Share of 70 or older
1970	21.6	65.8	66.3	57.0	29.6	8.1	(15.2%)	(3.3%)
1980	13.0	36.7	66.5	55.6	43.8	0	(20.3%)	(0.0%)
1990	3.7	22.1	37.3	58.4	40.3	15	(31.3%)	(8.5%)
2000	0.7	8.4	23.8	34.8	47.9	22.7	(51.0%)	(16.4%)
2005	0.2	4.0	18.6	30.3	43.0	46.9	(62.9%)	(32.8%)
2010	0.2	3.1	14.0	28.7	35.2	53.2	(65.8%)	(39.6%)
2015	0.1	1.4	8.4	24.7	33.2	58.7	(72.6%)	(46.4%)

Source: Statics Korea, each year, *The Census of Agriculture, Forestry, and Fisheries*, raw data.

Second, as agriculture's share in the national economy reduced and the farming population became aging, another issue of diminishing income emerged. The real income trends[4] from 2003 to 2019 show a couple of characteristics. First of all, the real income of farm households increased by 1.0% per year, on average, from KRW 33.81 million in 2003 to KRW 39.67 million in 2019. Next, on-farm income's proportion decreased from 41.6% in 2003 to 24.9% in 2019. During the same period, off-farm income's share increased from 35.0% to 42.1% and transfer income from 7.6% to 27.3%. As it is challenging to earn a living from farming activities, farmers have to make up through off-farm works or depend on the government's subsidies.

4) Farm households' income consists of on-farm income, off-farm income, transfer income, and irregular income.

Figure 2-2 Real farm income in total and by source (2003~2019)



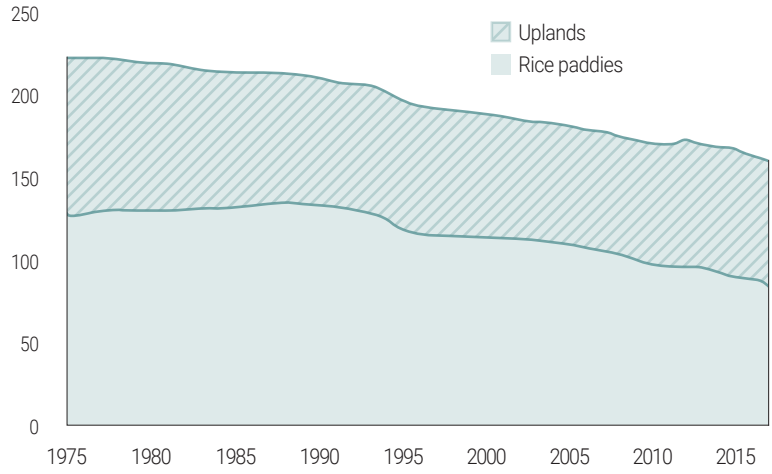
Note: The GDP deflator (2015=100) is used to calculate real income.
Source: Statistics Korea, each year, *The Farm Household Economy Survey*, raw data.

Changes in Key Production Factors in Agriculture

It is also necessary to look into a reduction in farmland size and an increase in industrial input. The entire farmland area decreased by 0.8% per year, on average, from 2.24 million ha in 1975 to 1.60 million ha in 2018 (Figure 2-3). The critical reason for the decrease in the farmland area is the land diversion for public facilities, housing, and other industrial facilities. The size of land diversion increased continuously after the 2000s to pick at 24,000 ha in 2007. Then, the diversion area decreased to 10,960 ha in 2014 and went up to 16,303 ha in 2018 ("Key statistics of agriculture, food, and rural affairs"). The diverted area from 2000 to 2018 was 284,947 ha, which amounted to 97.2% of the entire diversion.

Figure 2-3 Farmland area trends (1975~2018)

(in ten thousands ha)



Source: Statistics Korea, each year, *The Census of Agriculture, Forestry, and Fisheries*.

As the farmland area and the farming population diminished, farm households had to heavily rely on machinery and chemical fertilizers to maintain production. As a result, the capital input (excluding land) increased continuously (Table 2-8).

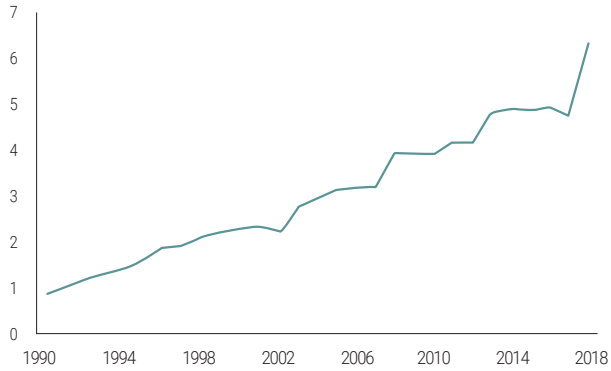
Table 2-8 Tornqvist index by individual production factor

Year	Total input	Labor	Land	Fixed capital	Intermediate inputs
1980	1.272	3.120	1.229	0.630	0.710
1990	1.210	2.214	1.229	0.630	0.710
2000	1.169	1.484	1.101	0.857	1.047
2010	1.000	1.000	1.000	1.000	1.000
2014	0.984	0.903	0.986	1.002	1.044
Annual increase on average	-0.008	-0.036	-0.008	0.036	0.022

Source: Hwang Euisik et al., 2016: 38.

Figure 2-4 Capital intensity trends (1990~2018)

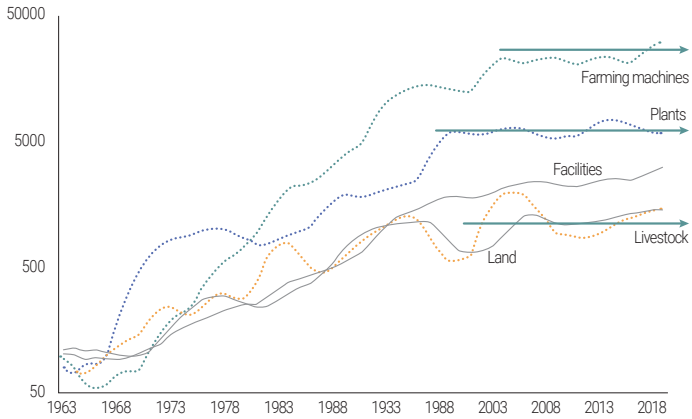
(in KRW millions/ 10a)



Note: Capital intensity refers to agricultural capital input per the unit size of farmland.
Source: Statistics Korea, each year, *The Farm Household Economy Survey*.

Figure 2-5 Changes in fixed assets per farm household (1963~2019)

(in KRW millions/ 10a)



Note: 1) Constant prices as of 2015 are applied. The GDP deflator (1962=100) is used for calculation.
2) Farming machinery prices are calculated based on the prices of 2015. Price indexes for farming machine purchase and farming furniture purchase are reflected for calculation.
3) Yearly index is a 3-year moving average.
Source: Yoo Yeongbong, 2020: 128.

The capital intensity trends from 1990 to 2018 show an increase in capital-intensive farming (Figure 2-4). However, recently, farm households do not invest in agricultural fixed assets as they did in the past. So the effect of substituting for a reduced labor force through capital input is likely to decline (Figure 2-5).

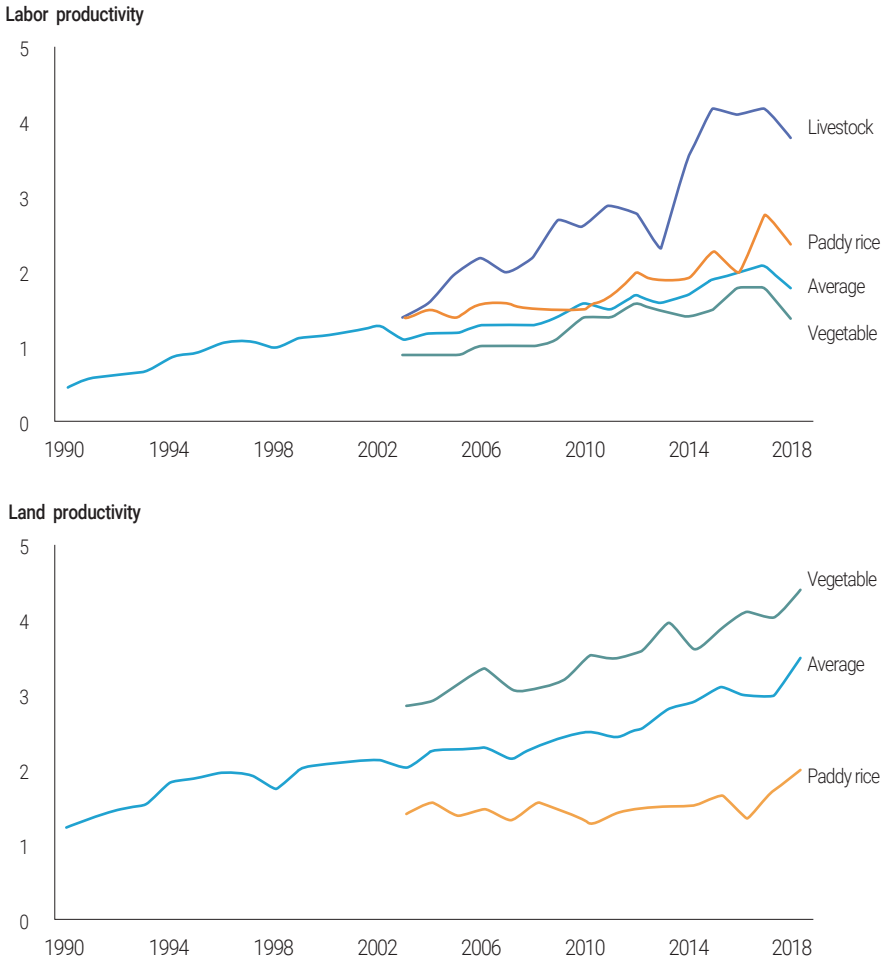
Agricultural Structure in Korea

The agricultural structure can be defined as the combination of major inputs, such as labor force, farmland, and capital (Rhew et al., 2019: 19). Following this definition, the changes in Korea's agricultural structure can be summarized as responses to a chronic shortage in the agricultural labor force by increasing capital input and endeavors to achieve economies of scale to mitigate a shock from market opening after the launch of the WTO regime.

Through the agricultural restructuring regime since the late 1980s, labor and land productivity-for major commodities-expanded (Figure 2-6). The primary reasons for increased productivity are the expansion in farmland per household and the higher dependence on capital input. However, in-depth observation and analysis are required to unmask how individual farm households changed livelihood strategies, including farm management methods. The coping strategies used by farmers include enlargement, intensification, hired labor force utilization, pluriactivity, and collaboration. Table 2-9 summarizes the result of structural changes by commodity.

Figure 2-6 Changes in labor and land productivity (1990~2018)

(in KRW ten thousands/ labor time, KRW ten thousands/ 10a)



Note: 1) The numbers are expressed in nominal prices.

2) Land includes owned and leased ones.

Source: Statistics Korea, each year, *The Farm Household Economy Survey*, raw data.

Table 2-9 Structural change trends by commodities

Category	Rice	Horticulture	Livestock
Total production	Reduced	Slightly expanded	Sharply expanded
No. of households	Reduced	Reduced	Reduced
Farming size per household	Slightly expanded	Slightly expanded	Sharply expanded
(Distribution)	Polarized	Status quo	Upward concentrated
Productivity gap by farming size	Gap expanded	Slight change	Gap expanded
Factors for change (differentiated)	Technology standardization, direct payments	Hired labor force	Technological gap, hired labor force, environmental regulations
Business types	Enlargement, pluriactivity, collaboration	Hired labor force, intensification	Capital intensification

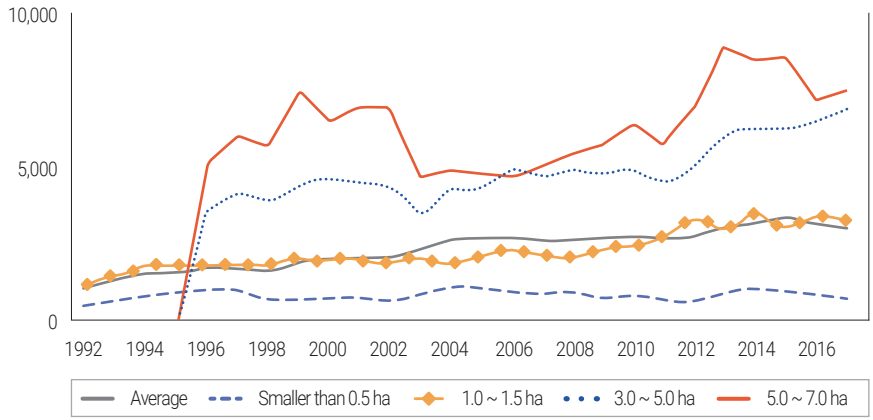
Source: Rhew Chanhee et al., 2019.

Enlargement

Enlargement means expanding a farming size per farm household. When an individual household cultivates more land, it can reduce production costs per unit area and achieve the effect of economies of scale (Table 2-14). Therefore, a household with a large farming size pursues enlargement to further increase farming income. In Korea, paddy rice farmers actively endeavored to scale up their farming size. From 2000 to 2015, the share of farm households cultivating larger than 3-ha rice paddies rose from 25.1% to 48.2% (Table 2-10).

Figure 2-7 Farming income by land size (1992~2017)

(in KRW ten thousands, KRW ten thousands/ ha)



Source: Statistics Korea, each year, *The Farm Household Economy Survey*, raw data.

Table 2-10 Share (%) of rice cultivation by farming size per farm household

Year	Smaller than 0.5ha	0.5~1.5ha	1.5~3.0ha	3.0~5.0ha	5.0ha or larger
2000	9.7	38.5	26.8	13.2	11.9
2005	9.3	31.9	22.7	14.8	21.4
2010	10.9	26.9	19.6	13.6	29.0
2015	10.4	23.6	17.7	14.0	34.2

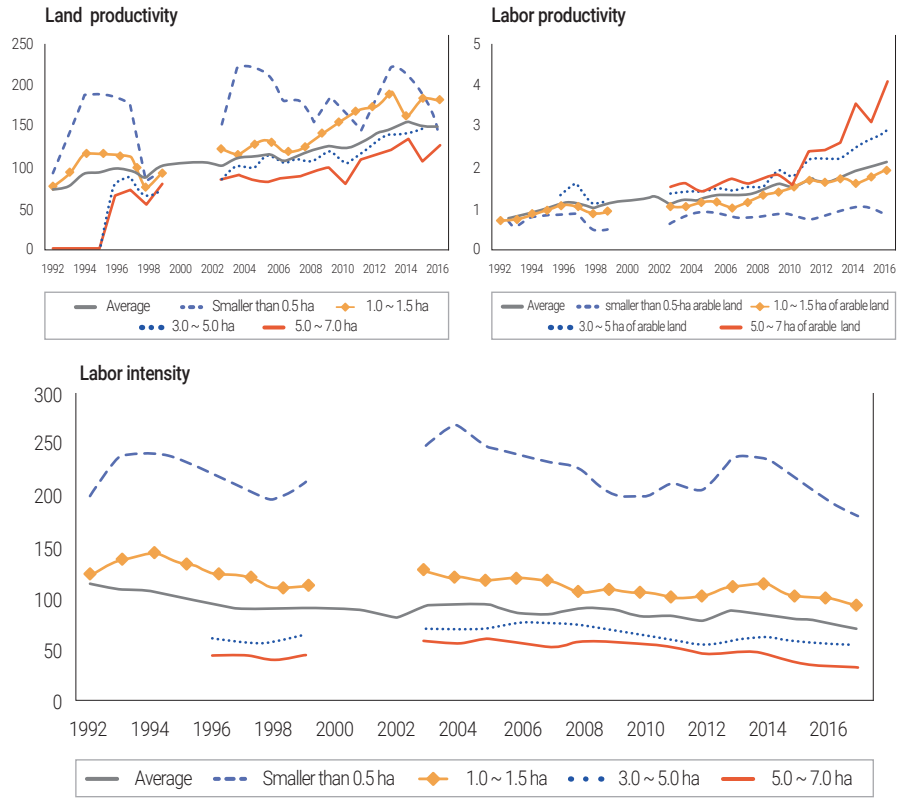
Source: Statistics Korea, each year, *Key Statistics of Agriculture, Food, and Rural Affairs*, raw data.

Intensification

Intensification refers to increasing production values per unit area or head (Jan Douwe van der Ploeg. 2018: 180). Small-scale farmers intend to gain more outputs by putting in more labor force (labor intensification), as they cannot quickly increase farming size or capital investment. In other words, land productivity and the degree of labor intensification are higher for small-scale farms (Figure 2-8). However, their labor productivity is low as the farming

Figure 2-8 Land/ labor productivity and labor intensity by land size (1992~2017)

(in KRW ten thousands, KRW ten thousands/ ha, hours/ ha)



Source: Statistics Korea, each year, *The Farm Household Economy Survey*, raw data.

income is relatively small. On the contrary, livestock and horticulture farm households are likely to hire a capital intensification strategy.

Utilization of Hired Labor Force

When the full utilization of family labor is insufficient to meet the required labor demand or a temporary (seasonal) lack of labor force, farms hire more

Table 2-11 Share (%) of farm households using hired laborers (2015)[5)]

Category		No hiring	Hiring	Up to 1 mo.	1~3 mos.	3~6 mos.
Total		55.1	23.0	16.2	4.7	1.1
Land area	Up to 0.5ha	74.4	13.0	10.5	1.6	0.4
	0.5~1.5ha	48.9	26.0	19.2	4.8	1.1
	1.5~3.0ha	28.7	36.4	23.5	9.5	1.9
	3.0~5.0ha	19.9	41.0	24.3	12.1	2.7
	5.0ha or larger	6.8	48.2	25.7	15.4	3.9
Item	Paddy rice	65.1	17.6	14.3	2.5	0.5
	Food crops	76.1	12.1	9.4	2.1	0.4
	Vegetables/ wild greens	42.0	30.0	18.7	6.8	2.5
	Special crops/ mushrooms	63.9	18.8	12.1	4.1	1.1
	Fruits	28.1	36.1	25.4	9.2	1.1
	Medicinal crops	40.1	30.4	21.1	7.1	1.4
	Flowers/ ornamental crops	47.7	28.0	14.1	7.6	2.6
	Other crops	40.2	31.4	16.2	8.4	3.8
	Livestock	51.6	27.3	14.4	5.4	1.3
Farming type	Full-time farm	53.1	24.0	16.7	5.0	1.2
	Part-time farm type 1	37.8	31.9	20.7	7.7	1.9
	Part-time farm type 2	68.1	16.2	12.9	2.4	0.4

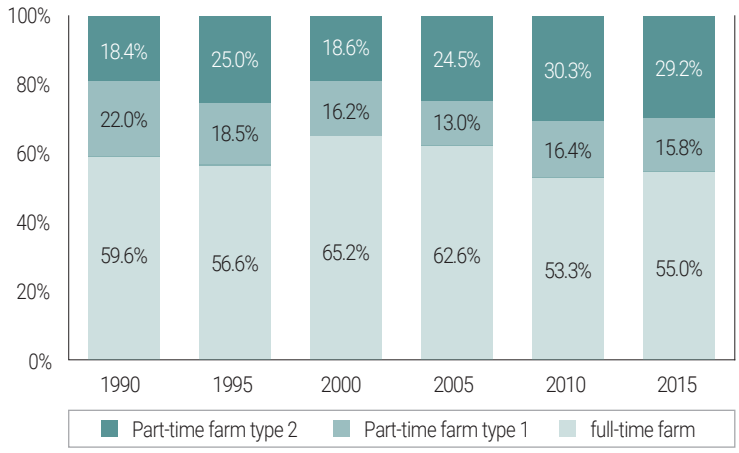
Source: Statistics Korea, each year, *The Census of Agriculture, Forestry, and Fisheries*.

laborers temporarily. As of 2015, 23.0% of the total farm households depended on hired employees (Table 2-10). By item, paddy rice, vegetable, and fruit farm housholds used hired labor forces, and most of them were day laborers. By farming type, full-time farm households' reliance on hired laborers was higher than those holding pluriactivities.

5) Farm types can be defined as follows:
- Part-time farm type 1 refers to farms that work full-time for farming and whose income from on-farm work is greater than off-farm work.
- Part-time farm type 2 refers to farms that do not work full-time for farming and whose income from on-farm work is less than off-farm work.

Figure 2-9 Farming with subsidiary businesses

(in KRW ten thousands, KRW ten thousands/ ha)



Source: Statistics Korea, each year, *The Farm Household Economy Survey*, raw data.

Pluriactivity

Some farmers take a pluriactivity strategy to increase income through other economic activities while doing farming. When farming income is insufficient to support daily lives or households have unused labor resources, they seek other income sources. So there is an increase in farm households with side jobs (part-time farm type 2) (Figure 2-9). The share of full-time households decreased from 59.6% in 1990 to 55.0% in 2015. While the proportion of the part-time farm type 1 rapidly reduced from 22.0% to 15.8%, the part-time farm type 2 increased from 18.4% to 29.2%. In particular, between 1995 and 2000, households with full-time farming increased by 8.6%p, while the part-time farm type 2 decreased by 6.4%p. On the contrary, between 2005 and 2010, the former declined by 9.3%p, while the latter expanded by 5.8%p.

Collaboration

When it is hard to manage farming only with family members in the household, farmers pursue collaboration. Specifically speaking, they utilize machines in cooperation through joint ownership or sharing, farm together to realize economies of scale, and/or co-work to sell products with strong bargaining power. The agricultural corporation system introduced in the 1990s is a representative example of agricultural collaboration in Korea. The initial focus was on corporation enlargement by pursuing individual production and co-marketing (Hwang Eui-sik, Jeong Ho-geun. 2008: 3). However, recently, more agricultural corporations engage in processing and distribution. Since the late 2000s, agricultural collaborations for farming machinery and seeds have formed, and village co-farming movements have emerged. (Chae. 2017).

Policy Implementation for Agricultural Restructuring in Korea

From the 1980s to the early 1990s, the agricultural restructuring policy focused on mitigating expected shocks from agricultural market opening. The comprehensive rural development program set up in April 1989 suggested basic restructuring directions and specific policy alternatives to market opening. In the 2000s, the government came up with plans to scale up commercial farming, provide off-farm income sources to induce 'marginal/subsistent' farms to exit, and renovate rural spaces for pleasant and convenient living. The rural restructuring program, announced in July 1991, specified a plan to invest KRW 42 trillion from 1992 to 2001 to enhance rural competitiveness and reinvigorate rural communities. The core of the agricultural policy between 1994 and 1997 was to improve the agricultural system for strong competitiveness. During the period, main projects were: full-time farming fostering, enlargement, farming

succession, rural industry development, upper limit expansion/ abolition in farmland ownership, farmland ownership for agricultural corporations, and direct payments for business transfer (early retirement). The investment plan for the special rural development tax, announced in July 1994, assigned KRW 9.77 trillion or 60.5% of the total fund (KRW 15 trillion) to enhance rural competitiveness.

The agricultural policy from 1998 to 2002 continued to strengthen competitiveness to respond to market opening. However, going through the financial crisis in 1997, the focus moved to farm management and income stability. Programs, such as organic farming and the direct payment program, introduced during this period, were necessary measures to stabilize business and income. The government enacted the Framework Act on Agriculture, Rural Community in February 1999, and announced the rural financing plan worth KRW 45 trillion in August of the same year. Its focus was on enhancing agriculture's multifunctionality and nurturing agricultural corporations.

In the early 2000s, the government pursued agricultural restructuring in a perspective different from previous policies. The significant characteristic of the comprehensive rural development program was handling agricultural and income issues differently. The government's agricultural program maintained the restructuring framework focusing on full-time farming. For example, it suggested a target to nurture 70,000 households with larger than 6-ha land fully dedicating to rice cultivation until 2010. The income policy was in line with the previous direction to enhance the direct payment program, safety nets, and off-farm income. The financing plan for the comprehensive rural development program targeted to invest KRW 119.3 trillion from 2004 to 2013. Unlike the previous plans, it emphasized agricultural restructuring and also targeted to finance for income increase, the direct payment program, rural welfare, and

local development.

After three financing plans, the government made no further plans.[6] However, from 2008 to 2012, the government endeavored to attract external capital and resources and revamp the agricultural system focusing on producers (Hwang Soo-cheol et al., 2018: 17). The effort for restructuring and competitiveness continued between 2013 and 2017.

Future Prospects and Tasks

Recently, external and internal conditions for Korean agriculture have significantly changed (Table 2-12).

External factors influencing agriculture include expanded marketing opening, consumption pattern changes, and demand for agriculture's multifunctionality. Besides, COVID-19 impacts Korean agriculture. Yoo Yeong-bong (2020) pointed out significant changes from COVID-19. First, agricultural product import shows no change. However, if the pandemic continues, a reduction in import volumes will impact Korean agriculture. Second, consumption patterns change as eating-out declines. Third, the influx of foreign laborers will decrease (Rhew Chan-hee et al., 2020). Internal factors influencing agriculture include reducing agricultural population and farmland, stagnant production and subsequent income reduction, and the reduced effect of capital input (Table 2-12).

Amid such changes, what would be the direction for agricultural restructuring? The survey result (Table 2-13) shows that reducing human

6) Nevertheless, the government tried to improve competitiveness through the national plan for Korea-Chile free trade agreement (2004), the comprehensive measures for Korea-EU free trade agreement (2010), the comprehensive measures for Korea-U.S. free trade agreement (2011), the complementary measures for Korea-U.S. free trade agreement (2012), and the measures for Korea-the 3 Commonwealth nations (2014).

Table 2-12 External and internal factors for Korean agriculture

Factors		Considerations
External	Market opening	- Restricting local products' prices from rising. - Hard to earn sufficient income through full-time farming.
	Consumption patter changes	- Causing oversupply due to reduced consumption. - Required to pursue the small-quantity production of multiple commodities. - Need to change distribution channels.
	Diversified demand for agriculture	- Specified and enhanced demand for agriculture's multifunctionality. - Emphasizing agriculture's roles to maintain the local economy and the population. - Change in values from COVID-19 may speed up demand diversification.
	COVID-19	- Impacting various aspects, including product demand and non-farming income sources.
Internal	Farmland reduction	- A reduction in farmland areas will diminish the production capacity. Consequently, competition to secure farmland will get fierce. - Possible to impact to farmland use methods, including land lease and facility investment.
	Reduced human resources and population aging	- Human resource shortages will impact co-relations among production factors, and cause productivity in agriculture.
	Capital restriction	- The size of capital investment can change following a reduction in demand or the farming income rate.

Source: Rhew Chanhee et al., 2020.

resources and aging, demand for agriculture's multifunctionality, consumption pattern changes would impact the future agricultural structure. To respond to the changes, Korea should focus on stable human resource supply pluriactivity and collaboration (Table 2-14).

Table 2-13 Results of survey on factors influencing Korea's agricultural structure

Category	Experts	Policymakers	Farmers	Others
Import expansion	7.7%	7.7%	8.7%	9.1%
Consumption pattern changes	17.3%	16.8%	16.3%	16.8%
Demand for agriculture's public functions	24.8%	23.6%	16.4%	19.2%
Farmland reduction	12.4%	12.8%	12.9%	12.4%
Reducing human resources and aging	26.0%	27.1%	27.4%	27.6%
Capital restriction	11.7%	12.1%	18.2%	14.9%

Source: Rhew Chan-hee et al., 2020.

Table 2-14 Results of survey on agricultural restructuring strategy

Category	Experts	Policymakers	Farmers	Others
Farming scale-up	18.6%	38.2%	20.1%	18.4%
Human resource supply	24.8%	17.3%	23.4%	23.8%
Capital intensity	16.5%	23.1%	17.7%	16.9%
Pluriactivities	15.6%	8.0%	15.8%	15.5%
Collaboration	24.6%	13.4%	22.9%	25.4%

Source: Rhew Chan-hee et al., 2020.

References

Chae Jonghyeon, 2017, "Conditions for collaboration: village farming," Korean Rural Sociological Society, 2017 conference presentation material.

Hwang Euisik, Kim Meebok, Kook Seungyong, and Choi Yejoon, 2016, "Investment plans for Korean agriculture's future growth (Year 2 of 2)," R796, KREI.

Hwang Soocheol, Lee Myeonghun, Jang Minki, Yoo Rina, Park Yoonji. 2018. "The Study on agricultural development based on sustainability and multi-functionality." MAFRA .

Jan Douwe van der Ploeg, 2018, *Farmers and Agriculture*, (translated by Kim Jeongseob and Rhew Chanhee), Tabi.

Lee Jeonghwan, 1997, "A shift in agricultural structure: the beginning and the end," Research Series 21, KREI.

Lee Jeonghwan, 2015, "70-year history of Korean agriculture (1): labor market's shocks and responses : aging and beyond aging," GS&J. Vol 202 (Aug 10, 2015), GS&J Institute.

Rhew Chanhee, Kim Jeongseob, Kim Taehoon, Choi Yongho, Oh Naewon, Park Jiyeon, and Lim Joonhyeok, 2019, "Prospects for changes in agricultural structure and countermeasures (Year 1 of 2)" R891, KREI.

Rhew Chanhee, Kim Taehoon, Kim Taehoo, and Ha Inhye, 2020 (to be published), "Prospects for changes in agricultural structure and countermeasures (Year 2 of 2)," KREI.

Timmer, C.P. 2007. "The Structural Transformation and the Changing Role of Agriculture in Economic Development: Empirics and Implications." Wendt Lecture, October 30, 2007, American Enterprise Institute Washington, DC.

Yoo Yeongbong, 2020, "A shift in Korean agriculture after COVID-19: focusing on public security and agricultural stability," Agricultural Policy Research (Quarterly). Vol 74 (Summer 2020):102-142.

MAFRA, "Key statistics of agriculture, food, and rural affairs."

Statistics Korea, each year, *The Economically Active Population Survey*.

Statistics Korea, each year, *The Farm Household Economy Survey*.

Statistics Korea. Each year, *The Survey of Agriculture, Forestry, and Fisheries*.

Statistics Korea. Each year, *The Census of agriculture, forestry, and fisheries*.

3. Farm Household Economy

This section explores the state of the farm household economy from 2000 to today through key indicators, including income, management costs, expenditures, and debts. Besides, it discusses related issues of significance.

The average farmland area per household was 1.5 ha in 2019. The average number of members per household was 2.36, and farm workers per household was 1.99. Most farm households used family resources for farming. The average income was KRW 41.18 million in 2019 and income from farming accounted for 24.9% (KRW 10.26 million) of the whole income.

As rural conditions changed, so did the farm household economy. In the 1970s, the priority was expanding food production and household income. So the emphasis on non-farming income activities encouraged farmers to take up sideline jobs. In the 1980s, commercial farming was introduced. During the period, the government implemented plans for improving farm business management based on performance analysis. In the 1990s, various farming business entities, such as agricultural association corporations and farming corporations, were set up. In the 2000s, the government prepared a scale-up plan, through which corporate farms emerged.

After 2010, Korea concluded free trade agreements with various countries, including the U.S., the E.U., and China. As agricultural market opening expanded, market risks became higher. The government executed income stability measures, such as the direct payment program and agricultural disaster insurance. Nevertheless, the income gap between urban and rural areas, as well as between farmhouses, and farming business risks have been the issues

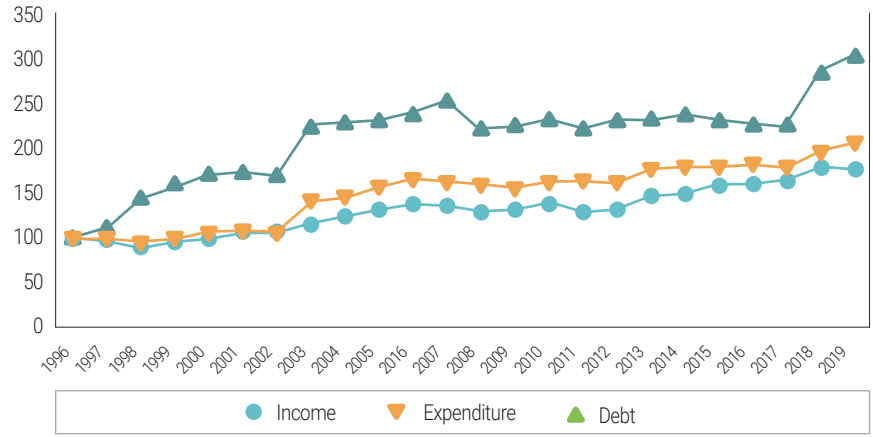
to be resolved. So policymakers have discussed to devise subsidy programs to stabilize income and business management.

Improvement in Key Indicators

Farm household income (nominal) had increased since 1998 and picked at KRW 32.30 million in 2006. Then, it dropped to KRW 30.14 million in 2011. It rose to KRW 42.06 million in 2018 and slightly declined to KRW 41.18 million in 2019. Farming household debt was stagnant due to low expectations on agricultural revenue with concerns on the aging and market opening. However, it sharply increased from KRW 26.37 million in 2017 to KRW 33.26 million in 2018. The reason was the increased investments in agricultural facilities. Farm households' living expenditure surged considerably compared with their income increase in the early 2000s. It stayed at the same level for years but started to rise slightly after 2017.

Between 2003 and 2019, the income (nominal) grew 2.7% per year, but the debt and the living expenditure rose by 1.9% and 2.4%, respectively. As the income increased more considerably than the debt or the spending, key economic indicators for farm households improved slightly. However, the improvement was not from profitability growth but an increase in transfer income, such as government subsidies and family inheritance.

Figure 2-10 Key indicators of farm household economy (1996=100)



Source: Statistics Korea, each year, *The Statistics of Farm Household Economy*.

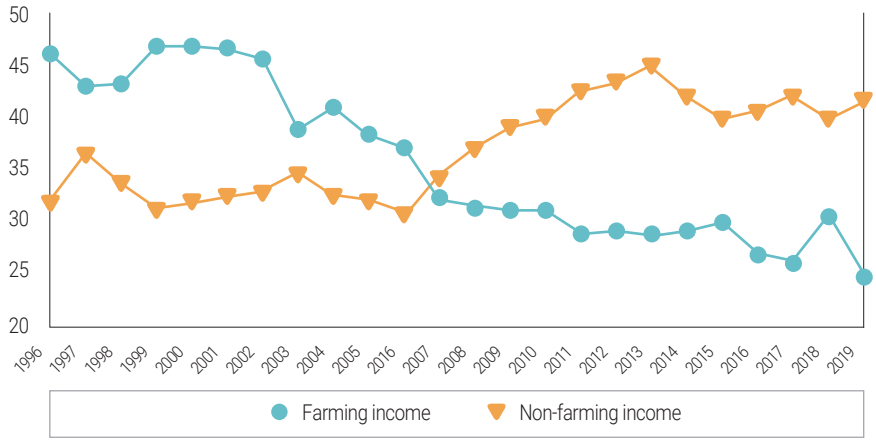
Stagnant Income Growth and Reliance on Transfer Income

The farm households' income peaked at KRW 32.30 million in 2006 and dropped to KRW 30.81 million in 2009. It rose to KRW 41.18 million as trading conditions, which aggravated until 2009, slightly improved after 2010.

Concerning income sources, the farming income plummeted from 50% in the early 1990s to 31.5% in 2009. In 2011, the absolute size of farming income decreased from the previous year. The Non-farming income started to rise in 1990 and temporarily dropped in 1997 due to the financial crisis. However, it recovered slightly in 1999, and has recently increased somewhat. Consequently, non-farming income and transfer income make up for the stagnant growth in farming income.

Transfer income took 7.6% of the whole income in 2003, but increased to 27.3% in 2019 because of direct payments for rice income executed in 2005.

Figure 2-11 Farming and non-farming income trends (1996~2019)



Source: Statistics Korea, each year, *The Farm Household Economy Survey*.

Public grants accounted for 5.2% of the farming income in 2003 but the proportion consistently increased after implementing the direct payment program. Smallholders rely on social grants (pension and living allowance), large farm households on agricultural subsidies.

Non-farming income mostly consists of non-business earnings, such as farm work, wage, and rent. The non-business earnings took 68.2% of the non-farming income in 2019 and 28.3% of the entire farm household income.

Non-farming income's proportion in the farm household income continues to rise, contributing to income stability. Agricultural product price hikes are limited due to increasing imports. Also, there is a limitation to income improvement due to rising management costs, such as labor and machinery expenditures. Against this backdrop, improving farming income by expanding non-farming income is gaining attention. To stabilize farmers' income, the government makes efforts

to develop new income sources based on the reappraisal of the previous non-farming income policy.

Aggravation in Terms of Trades

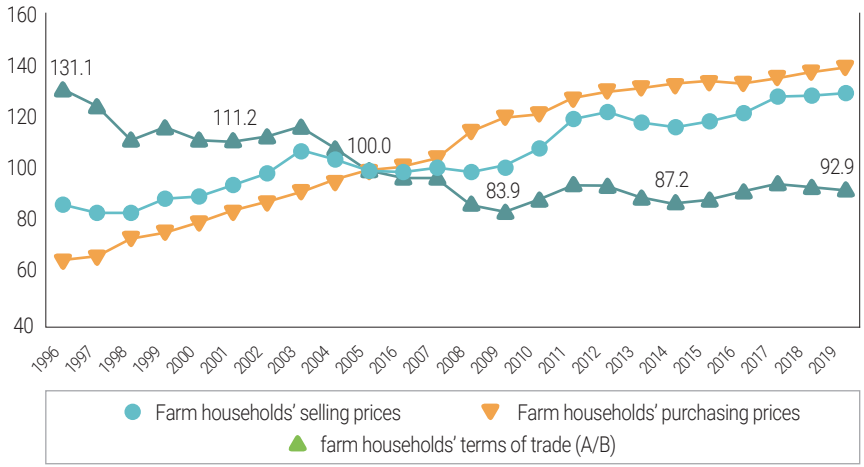
As the agricultural market opening went on and management cost rose, agricultural competitiveness became weaker. Agricultural growth became stagnant as imported products flowed into the local market in the mid-1990s, leading to a decline in product prices. As a result, the terms of trade worsened, and the increase in agricultural values did not occur.

The added value in agriculture, forestry, and fisheries (nominal) exceeded KRW 25 trillion in 2000 and slightly declined in 2008. It again rose continuously to KRW 33 trillion in 2018. However, the added value in the real term (as of 2000) posted KRW 22.58 trillion, 9.2% down from 2000. The ratio of the added value to the entire production in agriculture, forestry, and fisheries rose from 50.8% in 2008 to 60% in 2017. It posted 56.8% in 2018, 3.2%p down from the previous year.

The added value in agriculture decreased because the increase in intermediate inputs was faster than that in agricultural outputs. Also, surging labor costs and agricultural input prices contributed to the trend. The changes in terms of trade (2005=100) show that farm households' selling prices decreased after 2003, temporarily rose after 2009, and declined to 88.6 in 2015. Afterward, there was a slight rise to 94.5 in 2017 but a fall to 92.9 in 2019.

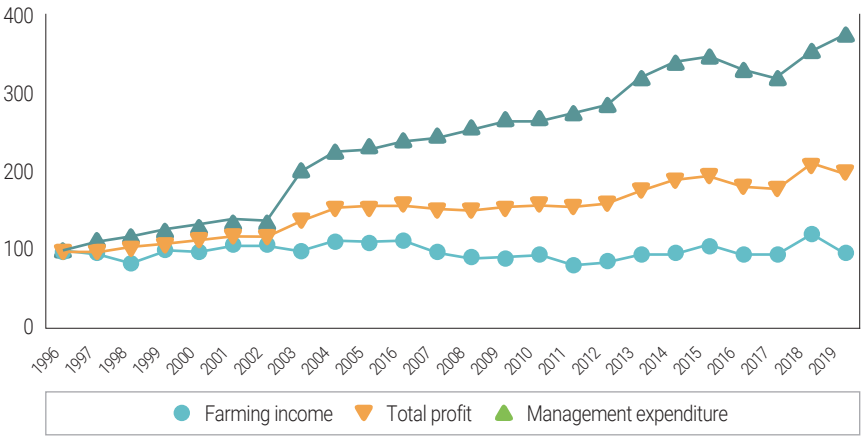
Because of oversupply from stagnant consumption and increasing imports, the real prices of agricultural products turned downward in 1995, and farming income became stagnant. Continuous market opening diminished product prices and farming income did not grow, although agricultural production increased.

Figure 2-12 Trends of farm households' terms of trade (2005=100)



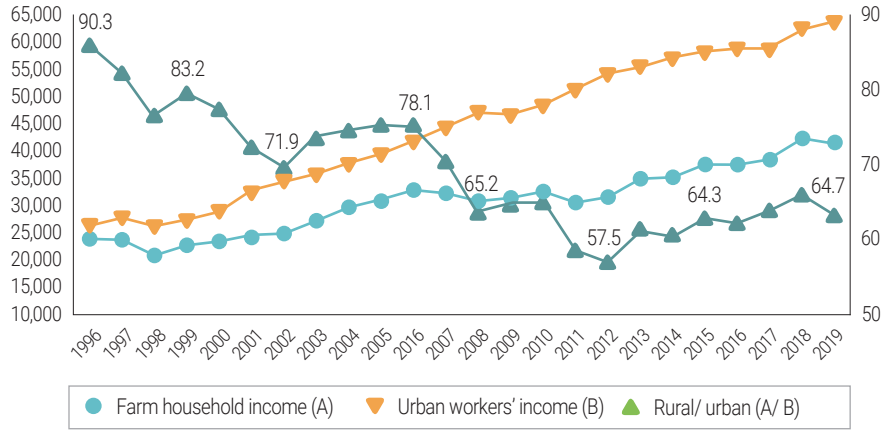
Source: Statistics Korea, each year, *The Survey on Farm Households' Selling and Purchasing Prices*.

Figure 2-13 Farming income, farm receipts, and management expenditures (1996=100)



Source: Statistics Korea, each year, *The Farm Household Economy Survey*.

Figure 2-14 Urban-rural income gap (1996~2019)



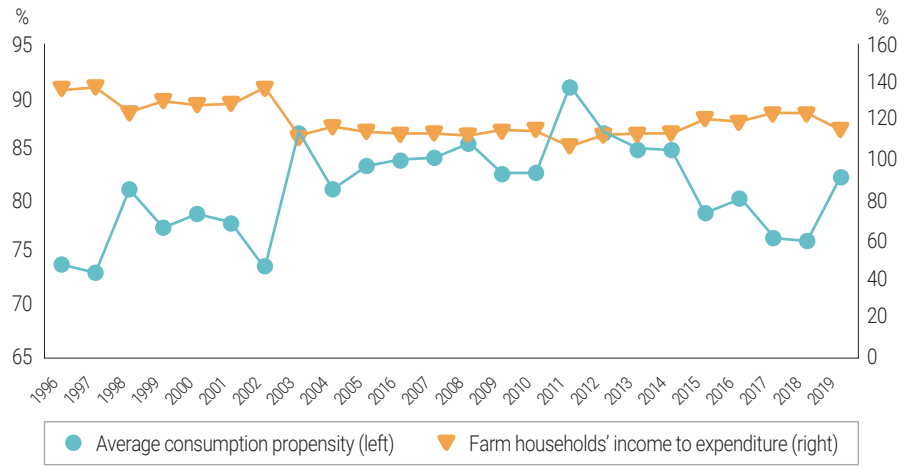
Source: Statistics Korea, each year, The Households Survey, *The Farm Household Economy Survey*.

Although farm receipts increased after 2000, income did not grow further due to a sharp increase in expenses. Recently, an increase in input costs for labor (due to labor shortages) and capital-intensive farming caused a rise in management costs.

Urban-rural Income Gap

The income gap between farmers and urban workers has expanded since 1995. It posted 72.0% in 2002 and 78.2% in 2005. It recorded 65% in 2012 and 64.7% in 2019. The urban-rural income gap worsened as farm households' income decreased amid falling agricultural profitability and aging. On the other hand, urban workers earned more thanks to continuous economic growth.

Figure 2-15 Farm households/ expenditure trends (1996~2019)



Source: Statistics Korea, each year, The Household Survey, *The Farm Household Economy Survey*.

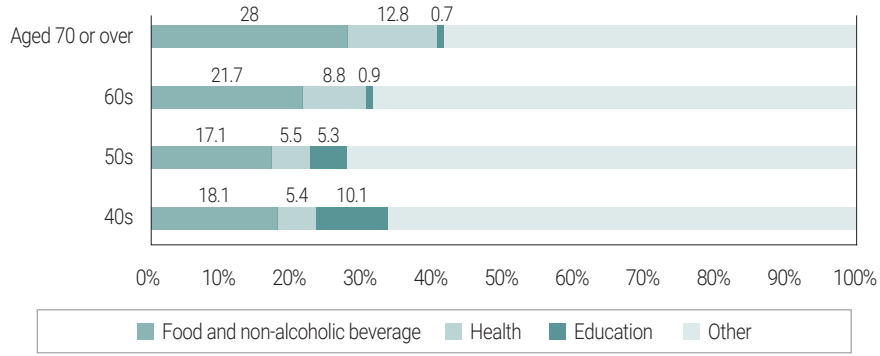
Farm households' Spending

Farm households are producers (business holders) and consumers (households) at the same time. Farm households' income to expenditure increased from 112.9% in 2012 to 121.6% in 2015, and 124.8% in 2017.

On the other hand, farm households' consumption propensity (consumption expenditure to disposable income) rose from 73.8% in 1996 to 83.4% in 2005 and 90.8% in 2011. However, it consistently declined after 2012 and posted 82.3% in 2019. The consumption propensity showed a gap among income brackets. Low-income folks had a high average consumption propensity. For High-income folks, their food expenses were small, but education spending was high.

By age, business owners' consumption expenditure showed that aged business owners spent more on food and medical services, while young farmers in their 40s on education. The trend shows the characteristics of the life cycle.

Figure 2-16 Farm households/ expenditure trends (1996~2019)



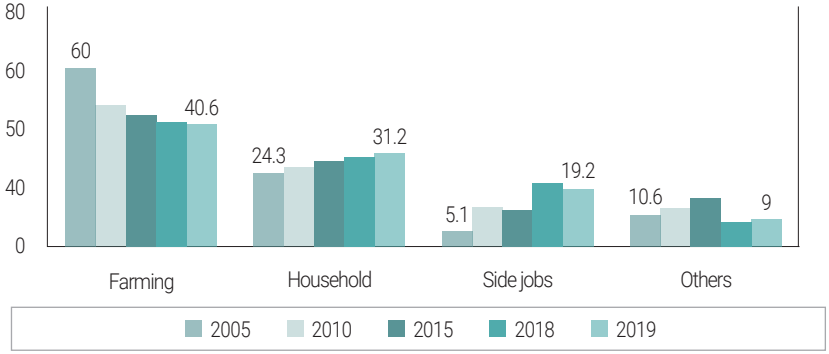
Source: Statistics Korea, each year, The Household Survey, *The Farm Household Economy Survey*.

Reduction in Farming Debt and Increase in Non-farming Debt

Farm households' debt rose from KRW 19.90 million in 2000 to KRW 29.94 million in 2014. Afterward, it was stagnant at KRW 27.88 million in 2014. However, it rebounded to KRW 35.71 million in 2019. From the business holder's viewpoint, debt is a financial burden due to interest payment. At the same time, it is an asset for new investments. The debt did not rise because farmers were reluctant to make new investments due to sluggish income from productivity reduction. Recently, debt increased because farmers needed money to invest in their side jobs, although some parts of debt were for farming purposes, including machinery purchase.

The purposes of debt show that farming debt decreased continuously after 2005, while debt for household uses increased. The trend implies the reluctance for investment in farming. Debt for agriculture decreased from 60.0% in 2005 to 40.6% in 2019. Debt for household purposes increased from 24.3% to 31.2%, while debt for side jobs from 5.1% to 19.2%. In other words, the debt structure

Figure 2-17 Changes in farm households' purposes for debt



Source: Statistics Korea, each year, *The Farm Household Economy Survey*.

tilted toward non-farming purposes for households or side jobs instead of farming purposes.

The analysis of debt details by farmland size in 2019 shows that smallholders with less than 1 ha held debt more for household or other purposes. On the other hand, large-scale farm households had debt more for farming purposes. Smallholders drew debt because they needed money to make up for insufficient income. If the trend continues, farm households' financial structure will get worse.

Outlook and Tasks

As the trading conditions become aggravated, farm income has decreased due to declining productivity. Worse, debt and household spending are sluggish, worsening the agricultural economy. Tariff rates of agricultural imports continue to diminish due to free trade agreements with economic powers, such

as the U.S., the E.U., and China. Management costs, including labor costs and material inputs, are likely to drag down the trading conditions.

Regarding management size and age, a significant gap shows up related to technology and income. As the ratio of specialized or large-scale farm households grows, they take a large share of the gross production. Therefore, agricultural policy needs to shift to efficiency and performance. In other words, it should focus on welfare, such as medical services and residential environment improvement for smallholders. For large-scale farmers, the focus should move to business risk management and financing services.

Debt for household and side jobs increases more than for farming. Debt causes instability in the agricultural economy but serves for growth if it is used for investments. A rise in debt for consumption is worrisome due to recent profitability reduction. However, as large-scale farmers need funds for investments, the government should seek ways to provide funds for the farming sector. As investments in farming are currently made through mortgage loan programs, they result in increasing debt. Therefore, instead of loaning services, the government has to expand investment-oriented financing plans. By diversifying financing methods, the government needs to widen farmers' access to necessary funds.

For income increase, farm households should shift to eco-friendly organic farming with added values, identify new income sources through the 6th industrialization, and create new markets for export. The government should prepare measures to drive such endeavors. Local product prices become unstable due to rising imports. Labor costs, rental fees, and increasing material prices threaten farm households' income stability. Therefore, the government should come up with plans to expand non-farming and transfer income. Besides, there should be measures to stabilize farmers' income for sustainable

farming and agricultural multifunctionality, as well as to expand business risk management programs.

References

KREI, *The Agricultural Outlook*, each year.

Statistics Korea, *The Farm Household Economy Survey*, each year.

4. Agricultural Cooperatives

Korea's Agricultural Cooperatives

Korea's agricultural cooperatives consist of two categories following the related acts. One is cooperatives called "*Nonghyup*" following the Act on Agricultural Cooperatives, and the other is cooperatives based on the Framework Act on Cooperatives. Nonghyup is Korea's first cooperative established in 1958. Since its foundation, it has enormously influenced the nation's agriculture and its development. The Framework Act on Cooperatives, enacted in 2012, allows any group of five or more members to establish a cooperative in all business fields except insurance and financial businesses. As of August 2020, 1,678 cooperatives in agriculture, forestry, and fisheries are registered following the Framework Act on Cooperatives. In general, in Korea, agricultural cooperatives belong to Nonghyup following the Act on Agricultural Cooperatives. It represents Korea's cooperatives in terms of history, roles, and influence. So this section focuses Nonghyup as Korean agricultural cooperatives. It is an organization with the most substantial influence in rural areas. All towns producing agricultural products have Nonghyup (primary cooperatives), and almost all farm households have their membership. Most cooperatives are operated for sale, purchase, and financial services in collaboration between them[7] and the National Agricultural Cooperative Federation (NACF). Nonghyup's financial service line, NH Bank, is the biggest in Korea in terms of the number of branches and assets[8].

7) Cooperatives consisting of farmers are called primary cooperatives, local cooperatives, or member cooperatives. In the past, regional agricultural cooperatives were called unit agricultural cooperatives.

8) The combined total of deposits received of primary cooperatives and NH Bank, the NACF's financial holding company, amounts to KRW 526 trillion (as of 2018) or USD 470.4 billion.

Nonghyup has unique characteristics different from other countries' agricultural cooperatives as follows:

First, it runs business services for product sale and material purchase and financial services for deposits, loans, and insurance. This characteristic is similar to the Japan Agricultural Cooperatives (JA) and the Farmers Association in Taiwan but different from specialized cooperatives in western countries.

Second, Korea has a two-deck organization composed of primary cooperatives with agricultural producers as their members and the NACF, as an umbrella organization for primary cooperatives. Although the primary cooperative and the NACF are independent corporate bodies but work in strong collaboration for agricultural progress.

Third, the primary cooperative and the NACF run independent businesses. In other countries, in general, their central organizations function for extension programs. However, in Korea, the NACF manages extension and business roles. Besides, the NACF has two different holding companies for Nonhyup businesses and financial services, and such a system is unique only in Korea.

Fourth, Korea's Nonghyup holds two different financial systems: One is mutual finance for the primary cooperative's members, and the other is the NACF holding company's NH Bank targeting general customers. The NACF holding company-Nonghyup Financial Group-also manages insurance, securities, investment businesses. So Korea's Nonghyup has a unique system, which operates mutual and commercial finance businesses.

Fifth, although Nonghyup's membership is not obligatory, all farmers are its members. As its members are the government's rural policy targets, Nonghyup can effectively implement policy programs on behalf of the government. Historically, the government established Nonghyup as a vehicle for economic development, and the organization is on track for that purpose.

Organizational Structure

Nonghyup has a two-deck system: primary cooperatives composed of farmers and the NACF representing primary cooperatives. The primary cooperative has two types, including regional cooperatives and special commodity cooperatives. The former is for farmers in the same administrative zone, while the latter is for producers of an identical commodity.

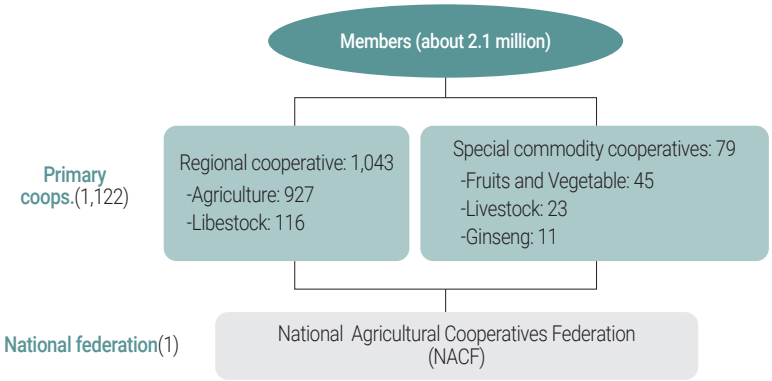
The regional cooperative has two categories: agricultural cooperatives for (towns) and *myeon* (townships) and livestock cooperatives for counties. All farmers can sign up for the agricultural cooperative in their residential area. All livestock farmers can subscribe to the regional livestock cooperative if they fulfill some livestock farming criteria. The regional agricultural cooperative was first organized for each village unit. However, through revamping in the 1970s, each *eup* or *myeon* came to have one cooperative. The framework is still in place, but its number has decreased through merge in response to socio-economic changes.[9] Regional agricultural cooperatives have to hold at least 1,000 members.

Special commodity cooperatives can zone areas. For a commodity with many producers, it has many cooperatives nationwide. On the other hand, an item with a few producers has one or two cooperatives covering the entire nation. The special commodity cooperative has three types: fruit and vegetable cooperatives, livestock cooperatives, and ginseng cooperatives.

The number of primary cooperatives is 1,122 as of the end of 2018. 82.6% (927 units) is regional agricultural cooperatives with 10.3% for regional livestock and 7.0% for special commodities.

9) 1,549 regional agricultural cooperatives were in operation in 1973, but the number declined to 927 (40.2% down) in 2018.

Figure 2-18 Organizational structure of Nonghyup



The NACF manages business services and extension programs[10]. The central headquarters is in charge of extension programs and mutual finance. The two holding companies-Nonghyup Marketing Holding Company and Nonghyup Financial Group-are 100% invested by the NACF and run agricultural produce marketing and financial services. The former has 18 subsidiaries, while the latter has nine. The NACF's mutual finance department functions as a central bank for mutual finance. It is in charge of deposits, loans, risk management, and the operation of deposit insurance funds.

The NACF has 16 provincial and 158 municipal offices, which work for extension programs and its networks with primary cooperatives. The NACF operates ten facilities for agricultural extension, including the Agricultural Cooperative University and training centers.

Nonghyup has 2,146,585 members as of the end of 2018, more than two

10) The Japan Agricultural Cooperatives (JA) operates credit, mutual-aid, and welfare services through its prefectural or national associations. Its central organization functions only for agricultural extension.

times larger than the number of nationwide farm households (1,021,000) (NACF, 2019). One farm household can sign up for multiple cooperatives, and different members of a family can subscribe to the same cooperative. Also, the number of associate members who do not have voting rights but use Nonghyup is 17.76 million. The average number of members per regional agricultural cooperative is around 2,000, while the average number per commodity livestock cooperative is about five hundreds.

The number of Nonghyup employees is 89,489: 62,783 hired by primary cooperatives and 26,706 hired by the NACF and its subsidiaries. The average hired by regional, livestock, ginseng cooperatives is 49, 181, and 27, respectively. The number of NACF employees for non-financial, financial, and extension sectors is 6,421, 17,693, and 788, respectively.

Businesses and Activities

Local food store

Nonghyup runs education, marketing, and financial business nationwide for agriculture and rural life. Its extension program is non-profit activities for its members and employees' education/ training, research, and information. Its marketing program includes agricultural product sales, farming material/ daily commodity purchases, product storage/ processing, and transportation. The financial program covers mutual finance, banking, insurance, investment, and securities.

Primary cooperatives are responsible for businesses in production areas, while the subsidiaries of the Nonghyup Marketing Holding Company are in charge of distribution and marketing. For example, the member cooperatives' marketing business focuses on sales in producing areas, while the marketing holding company's subsidiaries take charge in sales through consumer markets. Concerning purchasing business, the marketing holding company buys farm inputs and livelihood goods and supply to farmers through the member cooperatives. However, for small primary cooperatives which cannot cover nationwide demand, the marketing holding company uses its large-scale subsidiaries for face-to-face transactions with farmers, resulting in a conflict with the cooperatives.

The banking business has a complicated structure. Concerning mutual finance for members' deposits and loans, each cooperative functions as an independent corporate body (cooperative bank) and the NACF's mutual finance department as a central bank. If a cooperative has excess funds from its deposits, it deposits them in the NACF's mutual finance department. On the other hand, a cooperative, suffering from fund shortage, borrows from the NACF to lend to its members. The mutual finance department also manages the deposit insurance for a cooperative's failure to return deposits to its members. It also supervises risks in mutual finance.

NH Bank, a subsidiary of the Nonghyup Financial Group, serves general customers in cities and rural communities. It functions as a channel for the government's concessionary loans. The financial holding also has life and non-life insurers, and the primary cooperative is in charge of selling insurance. Besides, the financial holding has affiliates for asset management, securities, REITs (real estate investment trusts) management, and venture investment.

Nonghyup provides rural business holders-farmers and fishermen as well-

Table 2-15 Primary cooperatives' assets and debts (nationwide total)

(in KRW 100 millions, %)

Category	2017		2018	
	Amount	Ratio	Amount	Ratio
Total asset	3,563,930	100.0	3,776,316	100.0
Financial asset	3,262,396	91.5	3,452,159	91.4
Loan	2,321,624	65.1	2,496,503	66.1
Deposit	850,718	23.9	863,342	22.9
Others	90,054	2.5	92,314	2.4
General accounting	301,534	8.5	324,157	8.6
Debt and equity	3,563,930	100.0	3,776,316	100.0
Deposit	2,993,956	84.0	3,154,929	83.5
Capital	259,514	7.3	279,352	7.4

Source: NACF, 2019, *Agricultural Cooperative Yearbook*, p. 87. Table 3.

Table 2-16 Primary cooperatives' business performance (2018)

(in KRW 100 millions, %)

Category	Nationwide total	Avg. per cooperative
Marketing businesses	520,385 (100.0)	464
Sale	250,722 (48.2)	223
Purchase	105,005 (20.2)	94
Mart	96,192 (28.5)	86
Processing	54,432 (10.5)	49
Others	140,34 (2.7)	13
Financial businesses		
Avg. balance of deposits in mutual finance	3,082,815	2,748
Avg. balance of loans in mutual finance	2,367,423	2,110
Insurance premium	73,506	66

Source: NACF, 2019, *Agricultural Cooperative Yearbook*, p. 85, Table 1 and p. 86, Table 2.

with the credit guaranty service entrusted by the government. The service, introduced in 1972, provides credit guaranty to those who are not qualified to draw loans from banks due to a lack of assets to pledge.

Although Nonhyup carries out various programs for its members and rural areas, their income vary significantly. Although the marketing business is in

Table 2-17 Primary cooperative's income and loss

(in KRW 100 millions, %)

	Amount	Ratio
Gross income (A)	127,533	100.0
Financial business	83,498	65.5
Marketing business	44,035	34.5
Extension expenditures (B)	112,233	100.0
Education expenses	10,322	9.2
Sales management expenses	101,911	90.8
Non-operating gains and losses (C)	7,288	
Corporate tax (D)	2,851	
Net income (E=A-B+C-D)	19,737	

Source: NACF, 2019, *Agricultural Cooperative Yearbook*, p. 88, Table 4.

deficits, the financial business is in considerable surplus to make up for the former's deficit, distribute dividends to its members, and make reserves.

The primary cooperative's marketing business achieved KRW 52.04 trillion in 2018, while its financial business posted KRW 308.28 trillion in deposits (average balance) and KRW 236.74 trillion in loans (average balance) (NACF, 2019). Based on these performances, it achieved KRW 12.75 trillion in gross margin and its net profit except costs posted KRW 1.97 trillion. When calculated per individual cooperative, gross profit was KRW 11.37 billion and net profit KRW 1.76 billion. The marketing business area's ratio in gross margin posted 34.5% and the financial business area too 65.5%. Dividends on investment was KRW 388.9 billion (3.57% of dividend rate) with partronage refund in proportion to use KRW 518.7 billion.

The Nonghyup Marketing Holding Company earned KRW 27.88 trillion in 2018-KRW 21.44 trillion in agriculture and KRW 6.43 trillion in livestock. NH Bank, the biggest subsidiary of the financial holding, raised KRW 279.59 trillion, including deposits of KRW 217.48 trillion and borrowings of KRW 7.87 trillion. It

managed KRW 200.48 trillion out of the total as loans. The amount supplied as agricultural funds was KRW 36.17 trillion, 13.1% of available funds[11].

Nonghyup's extension program includes income increase support, farming consulting, legal counseling, welfare facilities, female farmers' education and welfare support, young farmers' training, and scholarship funds. The NACF holds KRW 5.65 trillion for the extension program.

Brief History

Founding Background

Korea, independent from Japanese colonial rule in 1945, put a priority on agricultural development, and needed to establish an agricultural cooperative.

The nation suffered from low income, poverty, high inflation, and political chaos. Food shortage was the biggest challenge to tackle, and the market system did not work well[12]. The rural areas, taking 70% of the population, were in a vicious cycle of poverty, trapped in high-interest private loans. The government targeted production increase for food self-sufficiency, market stabilization through supply and demand management, poverty relief, and social stability. Against this backdrop, Nonghyup was required to play a crucial role in achieving those goals.

Foundation and Growth

In 1948, the Mistry of Agriculture and Forestry (currently, MAFRA) designed

11) The amount raised excluding payment reserves and cash.

12) The U.S. Army tried to abolish the food rationing system, implemented under the colonial rule, and put supply and demand under the market's control. However, the market went into chaos and the U.S. Army turned back to the food rationing system.

a cooperative model after Germany's Raifeisen Cooperatives, which carried out financial and non-financial businesses simultaneously. However, the Finance Ministry thought non-financial businesses were risky and did not agree to have one organization run both of them. Because of the ministries' conflict, the establishment of legal frameworks was delayed. Finally, in 1958, a decade later, the government followed the Finance Ministry's direction and opened the Agricultural Cooperative and the Agricultural Bank.

The two organizations-the former for marketing businesses and the latter for financial services-were founded to contribute to agricultural progress in collaboration. However, they failed to do so. The Agricultural Cooperative did not have funds to carry out businesses, and the Agricultural Bank did not lend money out of a concern about credit risks. Finally, the government integrated the two organizations to make Nonghyup in 1961.

The government's initial idea about Nonghyup followed a typical cooperative model. However, its focus moved to Nonhyup's role as a policy executor. The government enacted law to apply an appointment system to Nonghyup's leadership to control the organization.

Initially, Nonghyup had a three-deck organizational structure: primary cooperatives (village), county cooperatives, and the national federation, the National Agricultural Cooperatives Federation (NACF). However, the village cooperatives were too small to carry out businesses. County cooperatives implemented businesses, but they were too big to closely communicate with each of the members. It was necessary to give more functions to primary cooperatives. Nonghyup carried out two campaigns to consolidate village cooperations from 1964 to 1972. As a result, the number of primary cooperatives shrank from 21,518 in 1962 to 1,549 in 1973. After the consolidation, primary cooperatives, serving *eup* (towns) and *myeon* (townships), were finally ready to

carry out businesses. They managed materials, such as fertilizers and chemicals, provided by the government. They ran shops to sell daily necessaries and products entrusted by their members. The mutual finance, introduced as a pilot, became in full swing nationwide in 1973. Primary cooperatives grew fast and Nonhyup functioned effectively. On the other hand, as primary cooperative grew, there was a conflict in roles between them and county cooperatives.

In 1981, the government disbanded county cooperatives and transferred their roles to primary cooperatives, resulting in the two-deck organizational structure. Also, as there was a need to specialize cooperatives amid agricultural progress, the government separated the livestock sector and created livestock cooperatives. However, livestock cooperatives, along with ginseng cooperatives, were merged into Nonghyup through the public sector restructuring in June 2000.

The government entrusted Nonghyup with various works, including the agricultural material provision and the government's procurement. As agriculture was not commercialized yet, agricultural product sales took a small portion of Nonghyup. In the 1960s, the NACF led businesses with county cooperatives in supporting roles. More than 80% of Nonghyup's purchasing was fertilizers provided by the government. 70% of sales were through joint markets. Also, 70% of Nonghyup's funds came from the government or the central bank's loans.

The NACF-led operation changed in the 1970s, as primary cooperatives grew gradually. In particular, the primary cooperative's mutual finance absorbed the informal financial markets in rural communities through savings campaigns. Table 2-18 shows the growth of Nonghyup's businesses with a remarkable increase in the 1970s and the 1980s. Its businesses grew in double digits until the 1990s but reduced to single-digit growth in the 2000s, implying that they were

Table 2-18 Annual growth rate (%) of Nonghyup businesses (in nominal prices)

Period	Marketing businesses			Financial businesses		
	Purchasing	Sale	Sub-total	Deposit	Loan	cooperative insurance
1965~1970	5.2	19.6	10.3	56.0	39.1	76.2
1970~1980	38.7	34.7	37.0	35.2	31.8	32.3
1980~1990	11.9	15.8	13.5	26.7	25.5	27.8
1990~2000	9.1	14.0	11.6	20.0	18.9	27.2
2000~2010	9.4	5.2	7.2	9.2	10.4	3.1

Note: 1) The numbers are the total of primary cooperatives and the NACF.
2) Deposit and loan are year-end balance.
Source: NACF (1991; 2011), Park Seongjae (2016).

in the maturity stage (Park, 2016).

Nonhyup's businesses grew continuously. However, profits came from the finance lines and made up for deficits in the marketing businesses. The problem in this structure is a reduced investment in the marketing businesses and negligence in inefficiency. As the Uruguay Round negotiations on the agricultural sector began in the late 1980s, there was an opinion to separate Nonghyup's financial and marketing businesses. Revitalizing the marketing part gained attention amid market opening discussions. There was a call for efficiency, but the opinion faced a strong objection that the existing comprehensive model (Nonghyup) was optimal for Korea's smallholding structure. The NACF prioritized efficiency improvement instead of the smallholding structure and implemented the restructuring to separate banking and marketing businesses in 2012.

Contribution to Rural Progress

Korea's Nonghyup followed a different path from cooperatives in advanced countries. When the nation's priority was in economic development, Nonghyup

functioned as a national organization for the government's rural development rather than a cooperative for farmers. Nonghyup fulfilled its duties and contributed to rural progress.

When private financial institutions were reluctant to provide funds due to low profitability and high risks, Nonghyup was a pipeline to supply funds to farmers. It mobilized savings resources in rural communities and invested funds raised in cities. It delivered the government's policy funds to promote investments in agriculture. Nonghyup improved agricultural productivity by supplying materials, such as fertilizers, chemicals, and machines. It helped to increase farmers' income and modernized product distribution platforms. It functioned as a center for rural communities, where residents received education and gained information. Now, Nonghyup faces a new challenge to expand its role to provide various services to all urban and rural communities nationwide.

Future Outlook

Nonnghyup has grown continuously but faces challenges amid the rural population aging and decline and stagnant growth in agriculture. The rapid aging in rural communities can cause massive deposit withdrawals for post-retirement. If tariffs become almost zero due to free trade agreements with other countries, Nonhyup will face harsh competition.

Nonghyup's banking business-its growth engine-does not have a bright future ahead amid declining national growth potential and low profitability in banking businesses due to low-interest rates. Rural financial markets are in excessive competition. Even member cooperatives and NH Bank branches are in competition with each other. Against this backdrop, there may be a call for merging primary cooperatives and restructuring banking businesses.

Conflicts among its members may cause an argument on Nonhyup's identity. Currently, Nonghyup believes that its vital mission is to secure channels for selling agricultural products produced by its members. However, most members are smallholders, and their interests are not necessarily in line with Nonghyup's mission. They may be more interested in welfare services demanded for the population aging.

Although the internal and external challenges Nonghyup faces are not small, it will manage to tackle them. Its history proves that its resources and capabilities will be enough to overcome those challenges. However, Nonghyup needs to change. If it is complacent with its current role, it will miss opportunities. It needs to create values through R&D investment and value chain management to respond to the consumer's demand and protect its members' interest.

Through endeavors to tackle challenges and respond to new demands, Nonghyup will become transformed from today. It may follow a path between the specialized model of Germany's Raifeisen Cooperatives and the comprehensive model of the Japanese Agricultural Cooperatives. Otherwise, Nonghyup will create a new development model unique to Korea.

References

Kim Yongtaek, 2013, *Establishment History of Nonghyup after the National Liberation*, Agricultural Cooperative University.

Park Seongjae, 2016, "Nonghyup's Transformation and Outlook after the National Liberation," Agricultural Economic Research, Vol. 57-1, Korea Agricultural Economics Association.

Park Seongjae, Park Joonki, and Shin Kiyeop, 2011, *Operation of Cooperatives for Rural Progress*. KREI.

NACF, 1963, *Korea's Agricultural Finance*.

NACF, 1981, *20-year History of Nonghyup*.

NACF, 1991, *30-year History of Nonghyup*.

NACF, 2011, *50-year History of Nonghyup*.

NACF, 2019, *Agricultural Cooperative Yearbook*.