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The Road Ahead for Korean Agriculture:
Soft Landing on a New Plateau in the WTO

Jung-Hwan Lee
Song-Soo Lim

Korea Rural Economic Institute

*Jung-Hwan Lee and Song-Soo Lim are respectively president and research fellow at the Korea Rural Economic Institute. Address correspondence to: Song-Soo Lim (songsoo@krei.re.kr), 4-102 Hoegi-dong, Dongdaemun-gu, Seoul, Korea 130-710.

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Abstract

In the midst of rapid economic growth, the agricultural production structure changed three to seven times faster in Korea than in the cases of many developed countries. As well, the employment structure was also adjusted rapidly to an extent that no other country has ever experienced. As experienced by other countries, the drastic change in the employment structure resulted from a sharp drop in new entrants to agriculture. A major reason is low job mobility among sectors, a common characteristic of labor markets. Accordingly, older farmers have increasingly become the dominant demographic in the sector where more than 50 percent of the agricultural labor force is over 60 years old. Ironically, the current old age-biased structure sheds light on a prospective conclusion that brisk shifts in generations especially for 10 to 20 years, will make the country settle down to the state of developed countries. To achieve a soft landing for this change, it is therefore of extreme importance for Korea to ensure flexible policies for this period in managing or controlling further market openness and reducing domestic support.

A number of structural adjustment policies in the 1990s contributed to significant productivity gains by promoting capital accumulation and farmland concentration toward large-sized farms. Expansion of large-sized farms facilitated by the encouragement of farmland leases has been transforming the structural orientation from owner farmers to tenant farmers. A serious concern, however, is raised that gains in farm incomes have not been realized in tandem with the agricultural growth and productivity gains in recent years. Farm household incomes accounted for no more than 75 percent of urban household incomes and a disparity among the incomes of farm households expanded so rapidly that 33 percent of the total farm households suffered from a persistent decrease in incomes in the last five years and the five-tile income ratios increased to 7.1 in 2002. Such a disparity among farm household incomes is largely attributable to many aged farmers with small-scale operations who suffer from declining incomes in nominal terms, facing few opportunities for job change and productivity boosts.

The simulated results by a sector-wide forecasting model suggest that direct payments required to compensate for farm income losses amounts to 3.03 billion US dollars in 2010, which exceeds the potential ceiling of domestic support (1.36 billion US dollars) proposed by the Doha Development Agenda negotiations.

As developed countries have enjoyed an adjustment to their agricultural problems under border protection and domestic support for a long period, Korea needs some flexibility in the speed of market openness with a view to attain a smooth transformation for its agricultural structure. The Blue Box-type direct payments should be also warranted in at least the short run to accommodate emerging commodity-specific needs for income compensation. This is a parachute for soft landing. It is not fair to take away this parachute which developed countries have used for a long time. This consideration should be relevant to other developing countries.

At the same time, the Korean government should ensure market function and continuity of structural adjustment in agriculture as recommended by the OECD. In the context of multifunctional roles of agriculture, the government may consider an integrated approach under which policy measures address agricultural commodities and public goods provided by farming as a whole, given the fact that transaction costs could be prohibitively high.

I. Introduction

Agriculture is multi-faceted in Korea. As an industry, agriculture provides food and opportunities for employment. As a backbone of the country, agriculture provides multi-functional roles to society such as protection of the environment, preservation of cultural heritage and rural viability (Oh et. al 2001). But, in the midst of the rapidly changing environment, the agricultural sector in Korea has to cope with a number of emerging challenges from domestic and external sources (Kang and Lim 2001).

Among others, the Doha Development Agenda (DDA) and rice negotiations under the World Trade Organization (WTO) are a top priority. Given a relatively high level of border protection and market price support today, the outcomes of the trade negotiations are likely to bring about substantial impact on the agricultural sector (OECD 2003a; KREI 2004).

The high protection for agriculture, especially for rice can be explained by the fact that the self-sufficiency rate for cereals was no more than 30 percent in 2002 and the imperative for food security is of great concern to the country (MAF 2003a). But, a more fundamental cause of such protective measures rests upon the so-called agricultural problem, a phenomenon that emerges from a certain stage of economic development (Lee 1998).

Low labor mobility from agriculture and a sharp reduction in new entrants to agriculture cause disparities in incomes and productivity between agricultural and non-agricultural sectors. As older farmers continuously accumulate in the agricultural sector, sufficient time should be warranted to settle the imbalance between the production and employment structure. Protective measures are the policy instruments needed to secure the periods to complete structural adjustment. Developed countries have long enjoyed their agricultural adjustments through border protection and domestic support. But for Korea and other developing countries, it would not be possible to follow in their footsteps since WTO regulations limit tariffs and domestic support.

Korea has been criticized in the WTO for having high protective measures for its agricultural commodities. However, it should be noted that industrialization started in Korea more than one hundred years after other developed countries but has accomplished a drastic change in industrial structure. It is not fair and relevant to ignore the great differences in industrialization history and to take away the parachute that developed countries used for their soft landing. This consideration is relevant not only to Korea but also to other developing countries following Korea.

The purpose of this paper is to explore the structural transformation process of

agriculture and show the need for flexibility in agricultural policy for a certain period of time. This paper is mainly divided into three parts. Section II shows how production and employment structures evolve over years. Section III analyzes current agricultural situations in terms of trade impact, farmland transfers and incomes. Finally, Section IV addresses emerging challenges from the WTO negotiations accompanied by an econometric analysis and suggests policy alternatives focusing on direct payments.

II. Agriculture in the Korean Economy

1. Transformation of the Industrial Structure

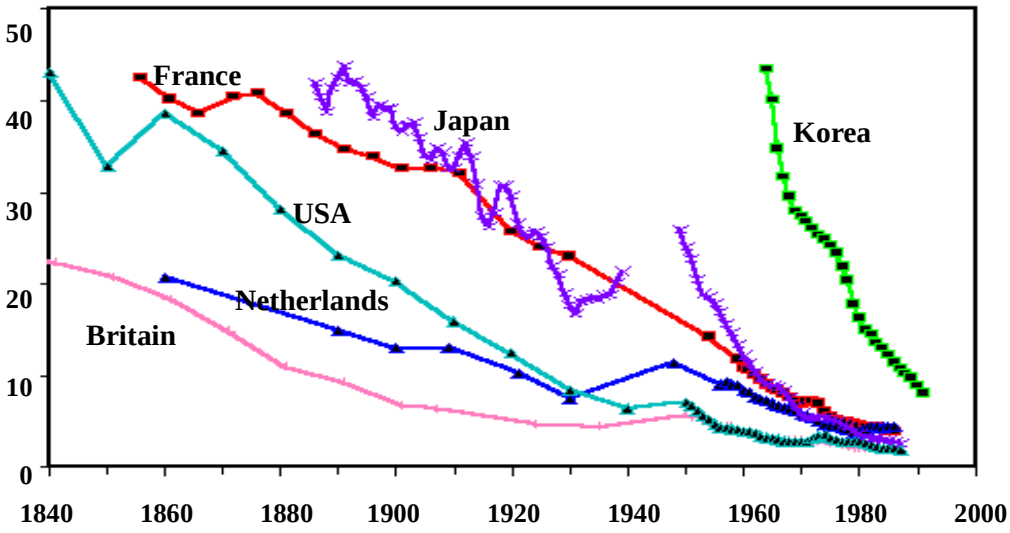
Korea has accomplished rapid economic growth since the early 1960s after the thorough destruction of the economy because of the Korean War. The spurt of economic growth was accompanied by a drastic change in the industrial structure. Agriculture's share of production declined sharply to 3.7 percent in 2002 from 45 percent in the early 1960s. At the same time, the share of the agricultural sector in employment decreased from more than 65 percent in the early 1960s to 9.0 percent by 2002. In the course of this rapid economic development, the agricultural sector has adjusted and transformed substantially to keep up with the pace of economic growth and changes in the international market for agricultural commodities.

Since Clark and Kuznets, it has been a fact that agriculture's share of both production and employment decreases with economic development. Figure 1 shows how industrial structure has been transformed in five developed countries and Korea. We can find in this Figure that Britain and the Netherlands, which initiated industrialization and commercialization, proceeded first in the trend of decline in agricultural share, followed by the United States, France and Japan. Korea has followed suit since the beginning of economic growth. However, it is remarkable that the speed of decline has been much faster than that of any developed countries.

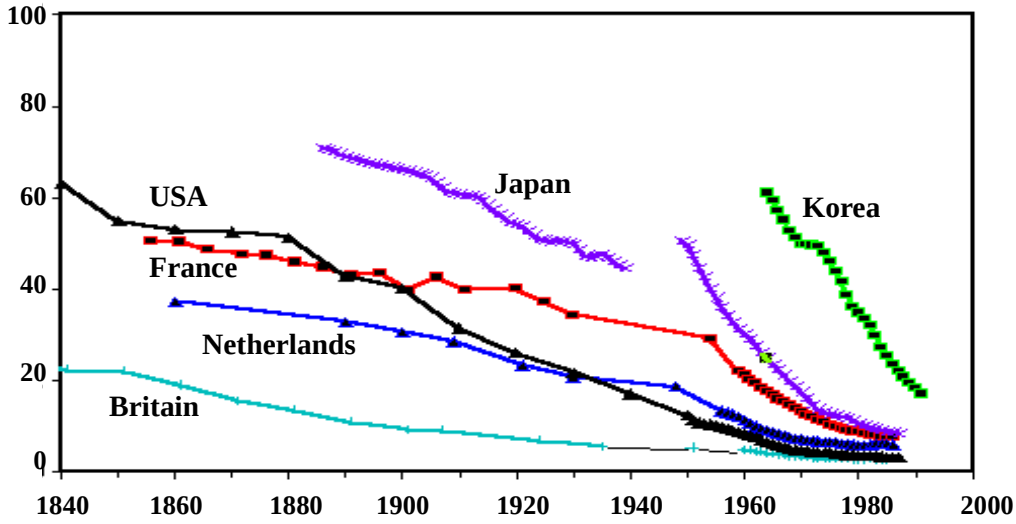
Figure 2 reveals that Korea passed the *first* transformation point in production structure, where the agricultural share began to be less than that of the service sector in 1965 and the *second* transformation point, where the agricultural share fell short of that of the manufacturing sector in 1973. While looking at the transformation of the employment structure, we note that Korea passed the *first* transformation point in 1978 and the *second* point in 1985, lagging twelve to thirteen years after transformation of the production structure. It is worthwhile to note that the agricultural share of the production and employment structure recorded similar transformation points of about 40 percent at the *first* point and about 25 percent at the *second* point. After passing the second point, the agricultural share of production and employment continued to decline quickly to 16 and 7 percent respectively in 1991, and nine and four percent in 2002.

Figure 1. Changes in Industrial Structure

<Production Share>



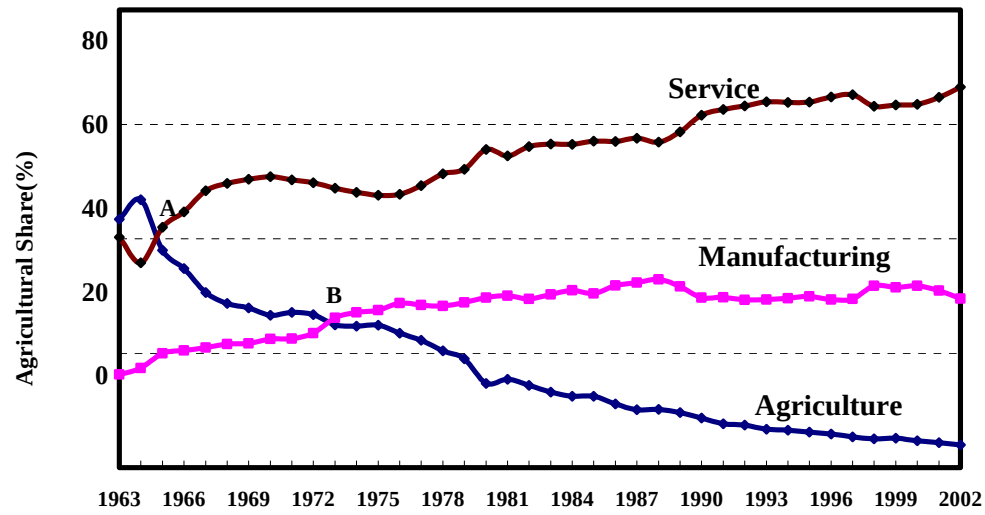
< Employment Share>



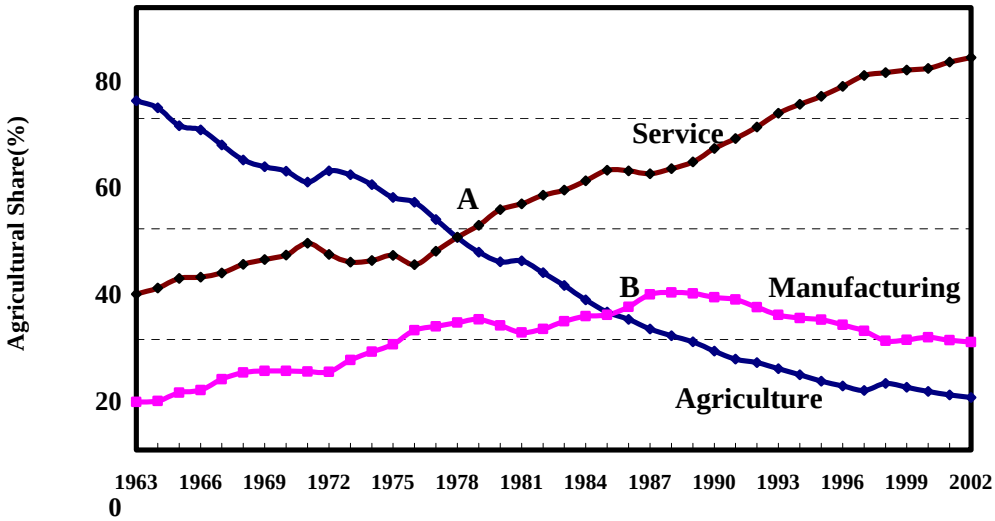
Source: Lee(1998, 24).

Figure 2. Transformation of Industrial Structure in Korea

<Production Structure>



<Employment Structure>



Source: EPB. *Annual Survey Report on the Economically Active Population Survey*.
Bank of Korea, *National Account.*

Table 1. Year When Agricultural Share in Production Reached 40 and 7 Percent

Country	Year of 40%	Year of 7%	Time Length (years)
Britain	1788	1901	113
The Netherlands	around 1800	1965	165
Germany	1854	1950	96
U.S.A.	1866	1958	92
Denmark	1850	1969	119
France	1878	1972	94
Japan	1896	1969	73
Korea	1965	1991	26

Source: Lee (1998, 26).

Table 1 shows the length of time for developed countries and Korea to reduce its agricultural share of production from 40 to 7 percent. The length of the time between 40 and 7 percent is 113 years for Britain, 165 years for the Netherlands, and about 100 years for other countries. As for Korea, the 40 percent of the first transformation point was reached in 1965 and the seven percent in 1991. The length of time was only 26 years in Korea. In other words, the production structure in Korea changed three to seven times faster than that of developed countries. Equilibrium in productivity between sectors can be attained only if the employment structure adjusts as fast as the production structure changes. Since the production structure changed so quickly in Korea, the employment structure was also adjusted rapidly-to an extent that no other country has ever experienced.

Table 2 shows how much earlier developed countries passed the points of 40 and 16 percent in agricultural share of employment. As mentioned in the previous section, the 40 percent is the *first* transformation point above, and the 16 percent is the 1991 level for Korea. Britain reached the 16 percent mark in 1868 (123 years earlier than Korea), followed by the United States in 1942 (49 years earlier), the Netherlands in 1950 (41 years earlier), and Germany in 1957 (34 years earlier). Denmark and France reached that level in the 1960s (about 30 years earlier), and Japan in 1971 (20 years earlier).

Table 2 also indicates the length of the time between the 40 and 16 percent marks for agricultural share of employment. Length of the time was 40 95 years for developed countries, in contrast with only 14 years for Korea. In other words, the employment structure changed three to eight times faster in Korea than in developed countries.

Table 2. Year When Agriculture's Employment Share Reached 40 and 16 Percent

Country	Agricultural Employment Share The Year of		Time Length (years)
	40%	16%	
Britain	before 1800	1868	more than 70
The Netherlands	1855	1950	95
Germany	1897	1957	60
U.S.	1900	1942	42
Denmark	1920	1962	42
France	1921	1965	44
Japan	around 1940	1971	about 31
Korea	1977	1991	14

Source: Lee (1998, 26).

2. Old Age Biased Structure of the Agricultural Labor Force

A decrease in agriculture's share in employment may be caused by three factors: job change, death and retirement, and allocation of new entrants. Let's look into the case of job change first.

Although available data to look into job mobility between sectors is very limited, we are able to take advantage of three sample surveys conducted in Korea. Table 3 gives the survey results along with some international data. During the sample period, the net rate of job change from agriculture to non-agriculture was 1.2 percent in Korea. However, we find that the situation was not much different in developed countries. The net rate was not much higher than one percent in France, Britain and Denmark, while it was much lower in Germany and even negative in Japan. The net rate was highest in the Netherlands but was still only 1.97 percent. The results highlight that the net job change from agriculture to non-agriculture is strictly limited.

Note that the low rate can be partly attributed to the move-in from non-agriculture offsetting the move-out. The rate of the move-out was more than 2 percent, but it was offset by the move-in, resulting in a net rate for job change at around 1 percent. Such a situation was similar in developed countries. Why do they return to agriculture?

To answer the question, one has to understand the characteristics of the non-agricultural labor market. The non-agricultural labor market can be distinguished as both primary and secondary. Increases in schooling and experience lead to higher job positions and pay in the primary market but not in the secondary. These features made the primary labor market relatively closed to an external labor supply; by contrast the secondary one is open. As a result, most of the migrant labor from agriculture can have access only to the secondary market and thus is likely to return to agriculture once they are disappointed or laid-off.

However, note that not only the *net* rate but also the *gross* rate of job change is not high. The low rate is mainly due to negligible job mobility for the aged agricultural labor force. As shown in Table 4, the older the generation, the lower the rate of job change. The rate of job change is less than one percent for the age class of 55 and older.

Since net job mobility in the labor market was so low, most of the decrease in agricultural labor force can be attributed to natural factors such as retirement and death as shown in Table 5. In other words, the decrease of agricultural labor force may be mostly driven by a generation shift which is a long-run process.

As mentioned above, job change in agricultural labor force was strictly limited and thus was mostly ascribed to natural factors. Given low job mobility from agriculture, its share of total new entrants should have been much less than that of production so that agriculture's share in employment could be adjusted in tandem with a decrease in the production share. Furthermore, most of the non-agricultural labor force was provided by new entrants rather than by the agricultural sector.

Table 3. Rates of Job Change from Agriculture to Non-Agriculture

Unit: % per annum

Country	Move-0ut	Move-In	Net-Out
Germany^{+}	4.21	3.86	0.35
France^{+}	3.48	2.38	1.10
The Netherlands^{+}	2.23	0.26	1.97
Britain^{+}	4.29	3.25	1.04
Denmark^{+}	5.70	4.35	1.35
Japan*	0.64	0.78	-0.14
Korea**	2.10	0.89	1.21

Note: + denotes the average of 1972/1973, 1974/1975, and 1976/1977.

* denotes the average of 1959, 1962, 1965, 1968, 1971, 1974, 1977, 1979, 1982, and 1987.

** denotes the average of 1982/1983, 1985/1986, and 1988/1989.

Source: Lee (1998, 72)

Table 4. Rates of Job Change in Agricultural Labor Force by Age

Unit: % per annum

Age	Japan			Korea		
	1962	1974	1987	1982	1986	1988
15 19	5.26	3.87	3.96	3.96	4.55	6.77
20 24	3.50	3.06		3.25	4.78	5.71
25 29	1.87	1.14	1.63	4.27	6.28	4.34
30 34	1.18	0.90	1.43	3.24	3.58	3.42
35 39	0.98	0.65				
40 54		0.61	0.43	1.60	1.01	1.73
55 and older	0.19	0.17	0.20	0.68	0.57	0.61

Source: Korea-EPB, *Report on Employment Structure Survey*.
Japan-Prime Minister's Office, *Labor Mobility Survey*.

Table 5. Sources of Decrease in the Agricultural Labor Force

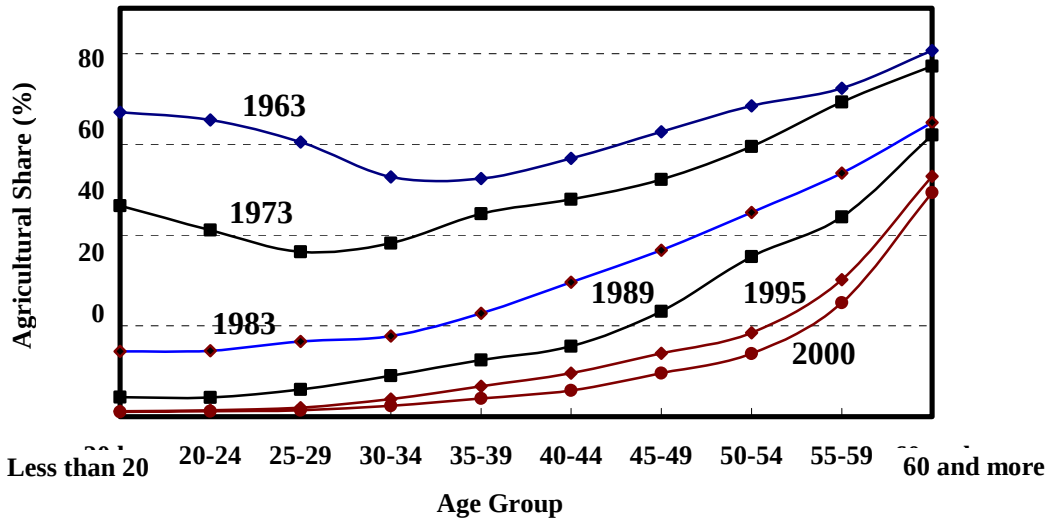
Unit: %

Country	Job Change	Retirement and Death			Total
		Retirement	Death	Sum	
Korea	32.2	27.7	40.2	67.9	100
Japan	-5.2	73.0	32.2	105.2	100
Britain	21.0	n.a.	n.a.	79.0	100
Netherlands	45.2	n.a.	n.a.	54.8	100
Denmark	14.4	n.a.	n.a.	85.6	100
Germany	2.6	n.a.	n.a.	97.4	100
France	10.1	n.a.	n.a.	89.9	100

Note: 1. Job change denotes net job change.
2. Retirement includes joblessness.
3. Retirement and death for European countries was estimated combining the survey data on job changes and statistics on agricultural employment.
4. Korea: the average of 1982, 1986, and 1988.
Japan: the average of 1959 1987.
European countries: the average of 1973, 1975, and 1977.

Source: Lee (1998, 76).

Figure 3. Shifts in the Age Profile Curve of the Agricultural Labor Force in Korea

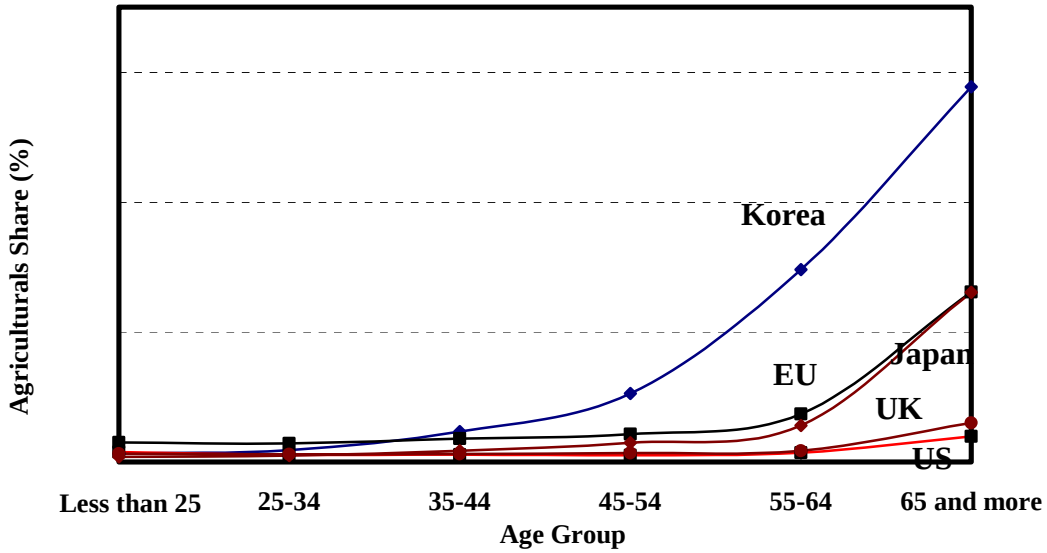


Source: EFB, *Annual Report on the Economically Active Population*.

The relation between agriculture's share in new entrants and in production was investigated through time series data of the seven developed countries and Korea. This result shows that agriculture's share in new entrants decreased 1.3 times faster than its production share. Meanwhile, agriculture's share in a generation changes very little once they get older than 30 years of age as implied by the low rate of job change. As a result, the age profile curve (APC) of the agricultural labor force, which shows agriculture's share in employment by age group, shifted in a biased manner, making the slope steeper year by year as presented in Figure 3 and now much more steeper than developed countries as shown in Figure 4.

It should be noted that 94 percent of total farm operators are now over 40 years old in Korea, whose job change tendency is strictly limited. Even more surprising is that 51 percent of total farm operators are now over sixty years old. In other words, more than half of farm operators started their farming careers before the early 1960s when income per capita was more or less 100 US dollars, and faced difficulty with getting jobs in the industrial sector. As the industrial sector grew to create new jobs, the farm operators were getting too old to take advantage of these opportunities. Economic growth was too fast for them to adjust to the new situation, leaving them no other option but farming.

Figure 4. Comparison of the Age Profile Curves in 2001

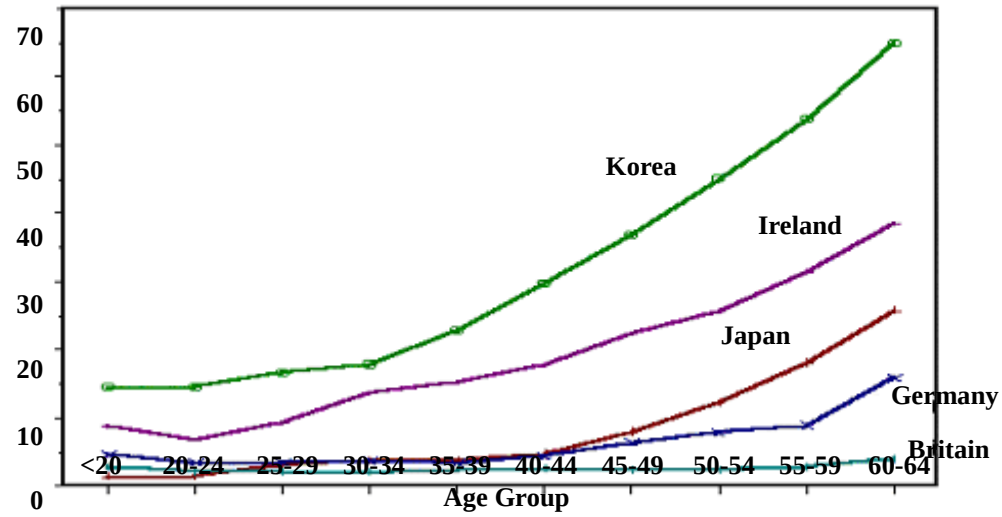


Source: Lim and Kim (2003).

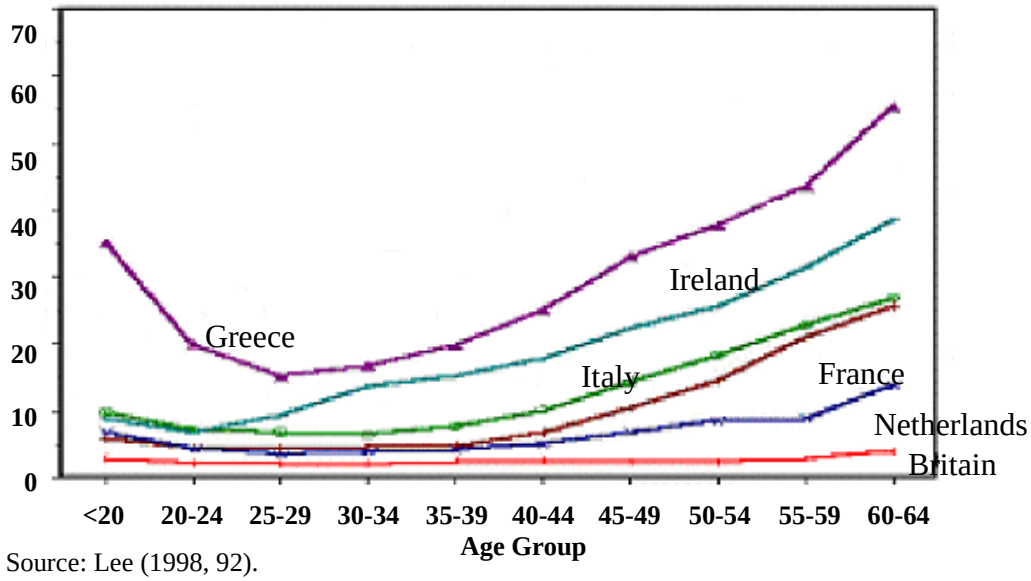
However, as shown in Figure 5 the age profile curves are steeper in Greece, Ireland, France, Germany, the Netherlands, and Britain in that order. This order corresponds to the order of agricultural share of production in such that Britain already reached the stage of a flat APC while the Netherlands is approaching that stage. Meanwhile, Figure 6 also shows that the APC of the agricultural labor force changed less year by year in Britain between 190l and 1977. The above observation leads us to anticipate that the old age-biased change of the agricultural labor force in Korea will gradually diminish and the APC will eventually become flat as generation shifts. As a matter of fact, the APC is already unchanging up to the 45 years old class, as shown in Figure 4. In addition, a cohort analysis says that about 65 percent of farm operators over 60 years old are to retire or pass away in 10 years. Given these considerations, it can be said that Korea may reach the state of developed countries in 10 to 20 years.

Figure 5. Age Profile Curves of the Agricultural Labor Force in 1975

<Panel A>

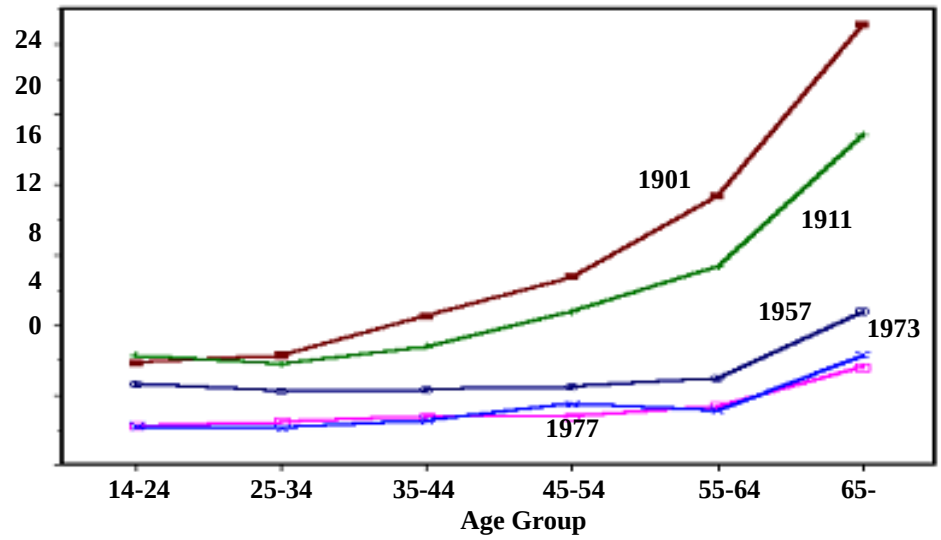


<Panel B>



Source: Lee (1998, 92).

Figure 6. Shifts in Age Profile Curves of the Agricultural Labor Force in Britain



Source: Lee (1998, 93).

III. Current Situations of Korean Agriculture

1. The UR Impacts

The UR Agreement on Agriculture has rendered a significant, specific and special impact on the agriculture sector in Korea. Most of all, market openness was symbolized by rice imports, from which is more than half of the total caloric intake under minimum market access (MMA). The MMA expanded from one percent of total domestic consumption in 1995 to four percent in 2004. In 2002 about 154,000 tons of rice was imported (MAF 2003a). Leading rice exporters include China, Thailand and the United States. The import regime of rice will be negotiated in 2004 with a view to determine whether tariffs should be imposed in place of the MMA.

Other farm products whose imports had been restricted by 1994 were also liberated. More specifically, the import restriction for beef was removed in 2001 thereby replacing it with a 41 percent tariff. Import of pork and chicken meat was allowed from July 1997 with tariffs of 25 and 20 percent respectively in 2004 (KREI 1999). The tariff-rate quota (TRQ) was established for seasoning vegetables such as red pepper, garlic and onion. The TRQ was created for 67 commodities and its average fill rate during 1995~98 was 128 percent, ranking 4th in the OECD countries (OECD 2002). As the UNDP (2003) points out, such a TRQ mechanism has provided real improvements in market access.

The process of tariffication in the UR put out bound rates for 118 items ranging from zero to 854 percent. They included starch, ginseng and agricultural seeds. In addition, bound rates of 10 to 947 percent were set for 108 items such as milk products, seasoning vegetables and fruits that were subject to the Balance of Payment clause. In this regard, the tariffication process itself shaped to a certain extent, Korea's current tariff structure.

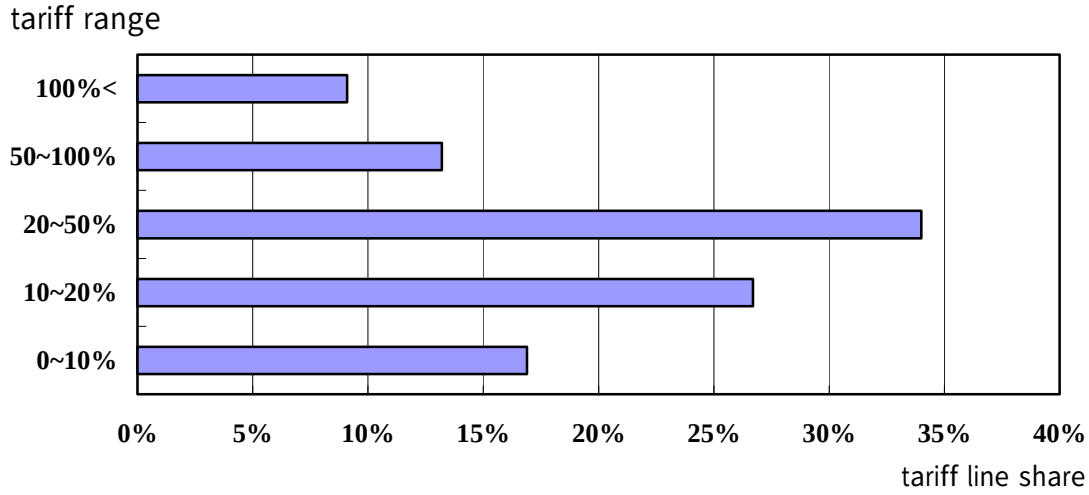
Figure 7 shows tariff distribution of bound rates. High tariffs exceeding 100 percent account for nearly eight percent of the total tariff lines. Products protected by high tariffs include cereals, seasoning vegetables and sesame. They are deemed important in either ensuring food security or keeping farm income. It is noteworthy that Canada, the European Union, Japan and the United States maintain tariff peaks of 300~900 percent on farm products such as rice, sugar, dairy products, meat, fruits and vegetables (Shirotori 2002).[1] Bound rates average 64 percent which is slightly higher than the world agricultural tariffs average of 62 percent (Beierle 2002). Applied tariffs resemble the bound tariffs structure. The

[1] Tariff peaks refer to high tariff, often defined as more than three times the average nominal tariff.

majority of applied tariffs fall in the range of 10~50 percent. The average rate is 56 percent, a bit lower than the bound rate.

As for domestic support, obligatory reduction of the aggregate measure of support (AMS) has been a binding constraint unlike the cases in most other OECD countries. Public intervention through a rice procurement program must be

Figure 7. Bound Tariff Rates



Source: Choi et al. (2002).

Table 6. A Summary of WTO Notifications for Domestic Support

Unit: 100 million won

	Bound AMS	Current AMS	De Minimis	Green Box	SDT	Export Support	Total
1995	21,826	20,754	2,822	39,902	204	12	63,694
1996	21,056	19,674	3,438	51,829	309	24	75,274
1997	20,287	19,400	6,553	57,962	378	30	84,323
1998	19,517	15,628	7,836	53,607	415	36	77,522
1999	18,748	15,519	4,865	54,566	621	149	75,720
2000	17,978	16,909	5,297	50,541	506	191	73,443

Source: MAF.

scaled down every year since it accounts for over 90 percent of AMS use. As a consequence, the proportion of rice purchased by the government to total production dropped from 29 percent in 1995 to 16 percent in 2002.

Table 6 provides a summary of WTO notifications for domestic support. The largest share in total support is the Green Box, accounting for 68 percent, on average over the 1995~2000 period. Green Box measures have largely been devoted to infrastructure and farmland improvement, and structural adjustment. Current AMS making up 24 percent in average is the second largest utilized mostly for rice programs. Another important category of support is the *de minimis*. Albeit well below the limit of 10 percent of production, they have been useful instruments in addressing product-specific income impacts from rapidly changing market environments.

2. Structural Adjustment Policies in the 1990s

Korea began to open its agricultural markets more rapidly at the end of the 1980s, graduating from the status of a BOP country in 1989. The Korean government set up an ambitious agricultural reform plan, the Integrated Policy for Rural Progress, in order to resolve its serious situation. According to this plan, a series of structural adjustment policies have been implemented and about 35.7 billion US dollars have been invested for the development of agriculture and rural areas since 1991.

First, the Farmland Purchase Support Program was initiated in 1988 to promote owner farmers to purchase farmland and was expanded in 1994 under the name of the Farm Size Optimization Program. This program included three kinds of sub-programs, the Farmland Purchase Program, the Long-term Farmland Lease Program, and the Farmland Exchange and Consolidation Program. The Farmland Purchase Program was the leading one until 1996, but the Long-term Farmland Lease Program became dominant since the purchase program cost too much and might have heated up farmland markets. This change reflects how the government realized the effectiveness of leasing to enlarge farm sizes.

Second, the Farmers' Retirement Program called, the Direct Payment for Farm Size Enlargement was initiated in 1997 to promote farmland transfer from old farmers to young full-time farmers. A farmer who is over 65 years old and wants to retire can get a direct payment of 2.5 million won per hectare if they sell or lease farmland to other full-time farmers.

Third, the discipline of *land to tillers* was amended step by step. The ownership of agricultural land previously limited to those who were engaged in farming is now open to anyone who wants to farm. By purchasing farmland, a

new entrant is able to enter the farming business.

Fourth, a 3-hectare ceiling on ownership of farmland imposed by the Land Reform was abolished in the Agricultural Promotion Area in 1996 and in all areas in 2003.

Finally, three programs were adopted to foster farm enterprises, namely the Full-time Family Farm Fostering Program, the Corporate and Company Farm Fostering Program, and the Education and Training Program. These programs aimed to promote leading farmers with larger farms.

3. Development of Tenant Farms

By the Land Reform Act of 1949 farmland was redistributed to resident farmers on an equity basis and tenant farming was prohibited to protect owner farms from a revival of nonresident landlords. About 92 percent of total farmland was converted to owner farms and more than 80 percent of total farms were transformed to full-owner farms in 1950.

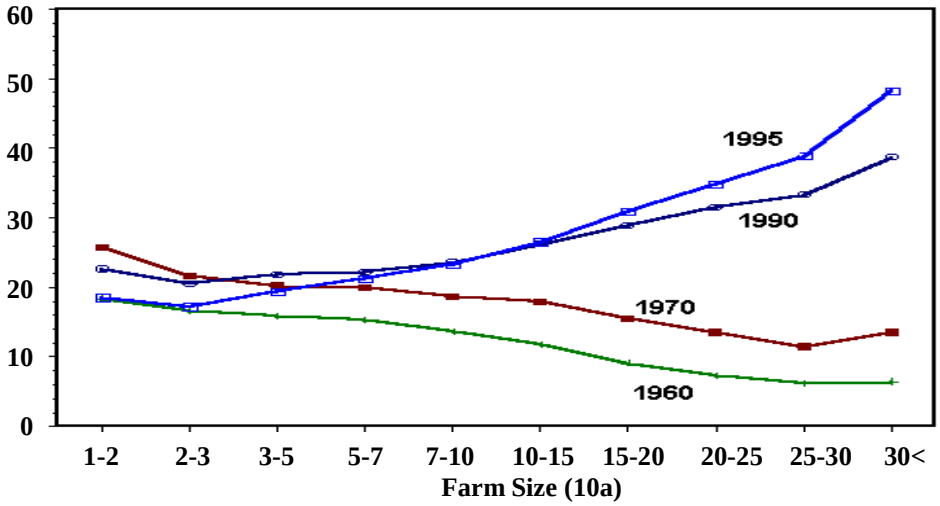
However, tenant farming was legalized in 1986 and promoted in the 1990s. Since then, tenant farming has accounted for 43.5 percent of total farmland areas, and is becoming dominant. As the trend of tenant farming accelerated, land leasing has become dominant in farmland transfers. In the 1990s, as much as 83.4 percent of total farmland transfers depended on leasing.

It is also noteworthy that the correlation between share of leased land and operational farm size is increasing (Figure 8). Land leasing enabled the smallest landholders to obtain a subsistence size before the 1980s, but it began to create large-scale farms in the 1990s.

As a result 63.1 percent of farms with larger than 3.0 hectares are tenant farmers whereas only 28.8 percent of farms with smaller than 0.5 hectare are tenant farmers. In other words, agrarian structure is rapidly changing so that owner farmers are small in scale while tenants are becoming large-scaled. Thus farmland leasing has become the main route for land transfers and large-scaled tenant farming is becoming the prevailing type of farming.

Why has leased land increased so quickly and leasing come to play such a great role? First of all, we should recall that farmland prices have increased to a great extent. This increase in farmland prices in turn raised owners' expected capital gains from their farmland. Farmland prices rose on an average of 6.4 percent per annum in real terms. This means that owners could ensure a 6.4 percent rate of return just by keeping ownership and that farmland was a good investment under inflationary conditions. As a result, farmland owners rented their land even if they could not continue farming. Such behavior by farmland owners appears to be common in developed countries, as well.

Figure 8. Changes in Share of Rented Areas by Farm Size



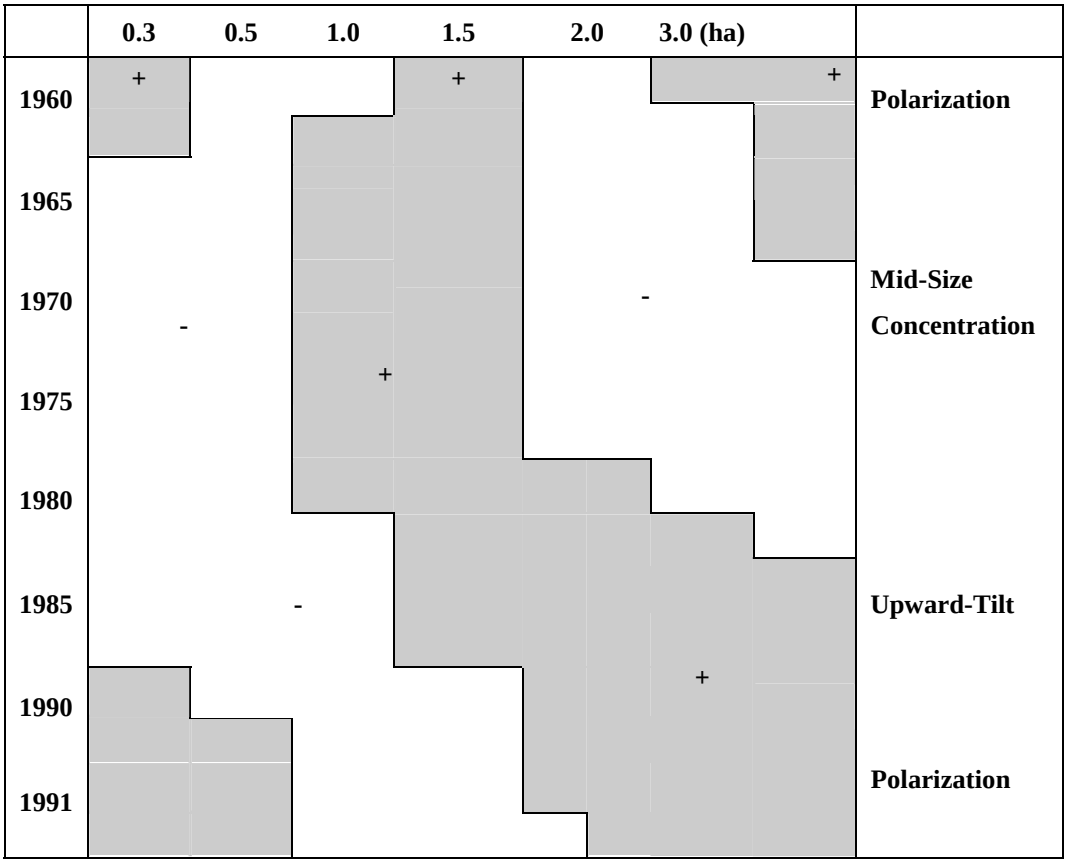
Source: MAF, *Census of Agriculture*.

4. A Biased Transfer of Farmland to Large-Sized Farms

So far we have been able to confirm that farmland transfers have been substantially activated, and leasing has largely expanded to play a dominant role in farmland transfers. Farmland transfers led mainly by leasing must have changed farm size distribution.

Figure 9 shows changes in farm size distribution. By the mid-1960s farms with smaller than 0.3 hectare and those with larger than 1.0 hectare increased while mid-sized farms (between 0.3 and 1.0 hectare) decreased. Such a polarization process had been in progress until the mid-1960s. Farm distribution shifted to favoring a mid-sized concentration in the mid-1960s, which lasted about 20 years. During this period, the number of mid-sized farms increased while that of small and large-sized farms decreased. However, from the mid-1980s, size distribution shifted, moving towards the large-sized end. Farms larger than 1.0 hectare increased whereas farms with smaller than 1.0 hectare decreased. From the end of the 1980s, farms smaller than 0.3~0.5 hectare began to increase again after a long trend of decrease. With this increase in small-sized farms, polarization in the size distribution was revived in Korean agriculture.

Figure 9. Changes in the Distribution of Farm Sizes



Source: MAF, *Statistical Yearbook on Agriculture, Forest and Fishery*.

The next question is why has this transformation of farm size distribution taken place in the course of economic development. A polarization process before the mid-1960s deserves to be accessed first.

Before the mid-1960s, non-agricultural employment was very limited and most second or third sons as well as first sons were employed in the agricultural sector. As a result, farmland was partitioned for the second and third sons creating new farms. Alternatively, they turned into either a tenant farm-renting a patch of land, or agricultural laborers without land. This is the process by which the number of total farms and small-sized farms with less than 0.3 hectare increased until the mid-1960s. Meanwhile, farm wages remained at a minimum level for a long time since abundant agricultural laborers were continuously available. By

employing these agricultural laborers, large-sized farms could sustain the process of enlarging their farm sizes transcending the limitation of family labor.

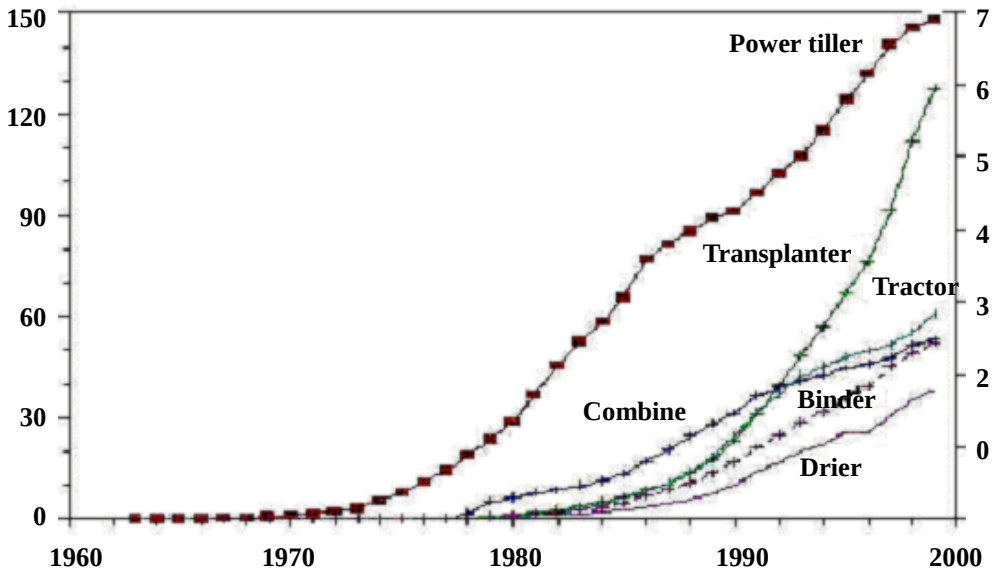
A mid-size concentration occurred between the mid-1960s and the mid-1980s. As non-agricultural employment developed, second and third sons or even first sons did not have to be employed in agriculture. Farms did not have to be partitioned. Meanwhile, as the supply of agricultural laborers declined, large-sized farms had to reduce farm sizes so as to keep within the capacity of family labor. They rented part of their farmland to be converted into mid-sized farms. It was the small-scale farmers who rented farmland previously operated by large-sized farm owners. It was because operators of small holdings could afford to bear the cost of higher rents as long as renting additional farmland would increase total working hours of family labor and thus family income. As a result, many small holdings could move upward to the mid-sized farms.

After the economy passed the turning point in Lewis's sense, agricultural wages rose so fast that farm mechanization took place rapidly in the 1980s as shown in Figure 10. This mechanization raised rents that only large-sized farms could afford and the direction of land transfers shifted to large-sized farms from the mid-1980s. From the beginning of the 1990s, part-time opportunity increased and thus very small-sized farms began to increase, catching the part-time opportunity. This is the polarization now in progress in Korea.

Farmland transfers to large-sized farms were strongly galvanized by the government in the 1990s and acreage share in large farms increased to a great extent. As for paddy farming, for example, farms with less than 0.5 hectare account for 44 percent in total farm households and their share of farmland amounts to only 13 percent. On the other hand, 3.8 percent of rice farms with more than 3 hectares in size account for 20 percent of paddy field, more than three times larger than in 1990 (Table 7).

As shown in Table 8, production costs decrease increasingly as farm size increases. Production in a small farm with less than 0.3 hectare costs 11 percent more than in a farm of one hectare and production in a farm of 5 hectares costs 15 percent less than in a farm of one hectare. It implies that in the future production costs will be reduced with rapidity as farm size expands.

Figure 10. Agricultural Mechanization



Note: Right hand side scale is for power tiller.
Source: Agricultural Machinery Cooperative, *Agricultural Machinery Year Book.*

Table 7. Acreage Distribution by Farm Size

Unit: %

	1990		1995		2000	
	Household	Acreage	Household	Acreage	Household	Acreage
	1,508 (1,000)	1,194 (1,000 ha)	1,205 (1,000)	1,054 (1,000 ha)	1,078 (1,000)	999 (1,000 ha)
Total	100.0	100.0	100.0	100.0	100.0	100.0
0.5 ha and over	59.6	84.3	58.8	85.6	57.8	86.2
1.0 ha and over	25.7	53.1	27.4	59.4	27.2	61.6
1.5 ha and over	10.7	29.9	13.8	40.2	15.4	45.7
2.0 ha and over	4.7	16.9	7.4	27.6	8.4	32.3
3.0 ha and over	1.2	6.2	2.8	14.8	3.8	20.0

Source: MAF, *Census of Agriculture.*

Table 8. Farm Sizes and Production Costs

Farm Size (ha)	0.3	0.5	1.0	2.0	3.0	5.0	10.0
Cost Elasticity	0.924	0.917	0.907	0.897	0.892	0.880	0.875
Cost Index	111	106	100	93	90	85	78

Source: Lee and Ahn (2002).

5. Contradiction between Productivity and Farm Income Productivity

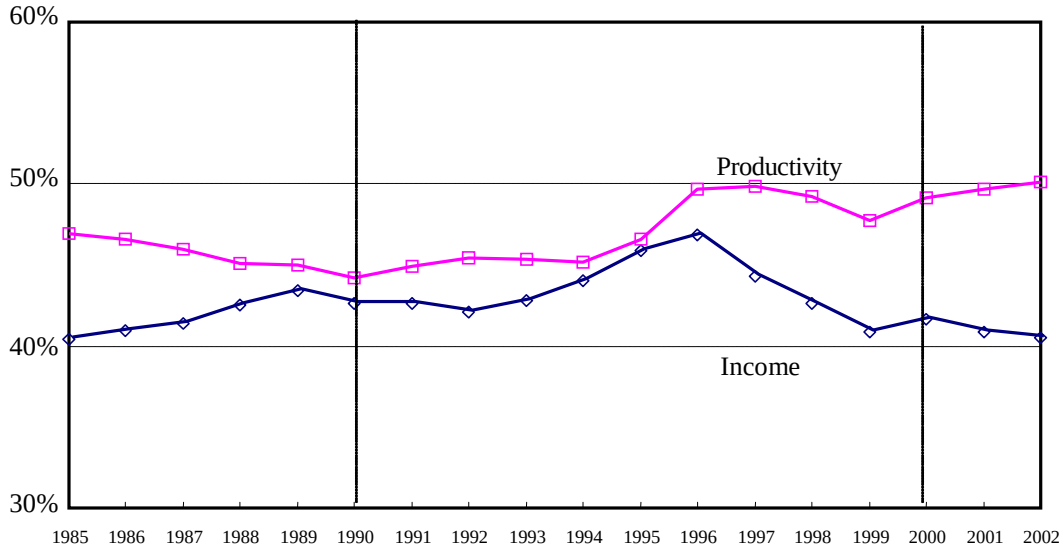
Increased investment and policy drives contributed to rapid growth in productivity. Since the beginning of the 1990s, the annual growth rate of agricultural fixed capital was at nine percent. Subsequently the agricultural growth rate, which had slowed downed to -0.6 percent in the late 1980s, recovered to 2.2 percent in the 1990s as shown in Table 9-in spite of the 1997/98 financial crisis. The table also shows that the performance of the 1990s was ascribed to the growth of the livestock and vegetable sectors. Remarkable growth in the livestock sector could be explained by a sizable decrease in production in the beginning of 1990s and a strong demand for domestic livestock products. On the other hand, greenhouse technology made vegetables available all year round and vegetable consumption jumped in the 1990s helped expand production.

At the same time, rapid development of farmland transfers and labor-saving technologies enabled agricultural employment to be reduced 5.5 percent per annum and thus labor productivity increased by 7.7 percent per annum in the period, which was much higher than that of the non-agricultural sector. Consequently, productivity difference between agriculture and non-agriculture sectors shrank in the 1990s as shown in Figure 11. Agricultural productivity increased by up to 50 percent of the non-agricultural sector in 2002 from 44 percent in 1990.

Farm Incomes

A gain in farm incomes was not realized however by good performance from agricultural productivity. On the contrary, difference in incomes between farm and non-farm sectors expanded in the late 1990s, as shown in Figure 11. Due to production gains and imports, prices for farm products dropped by one percent per annum in real terms. While lowered prices for farm products meant benefits to consumers, farmers suffered from income losses. That is, real farm income decreased nearly 2 percent per annum in the period, a striking drop from the

Figure 11. Productivity and Income Ratios between Sectors



Source: BOK, *National Accounts.*

Table 9. Sources of Agricultural Growth in the 1990s

Unit: %

	Growth Rate	Contribution Rate
Rice	-1.12	-18.9
Vegetable	4.58	50.2
Fruit	5.37	21.4
Livestock	6.73	35.1
Total	2.20	100

Source: BOK, *National Accounts.*

increase before the mid-1990s. Income per farm worker was about 47 percent of non-farm worker's in 1996 but further declined to 41 percent in 2002.

In addition to income differences between sectors, income disparity among farm households expanded remarkably to the extent that 33 percent of total farm households suffered from a persistent decrease in income in the last five years and five-tile income ratios increased up 7.1 in 2002 from 5.5 in 1994. It is important to know that a productivity gain accompanied by lower prices is a due process of improving competitiveness by reducing price gaps between domestic and imported commodities. In this situation, farmers should be provided with income

subsidies for their soft landing process.

Without this compensatory income device, a great loss of farm income resulted in debt problems. At the end of 2002, the average debt per farm household was 19,898,000 won (about 15,900 US dollars). Since the debt-to-asset ratio remains at only 12 percent on average, it appears worrisome. However, about 22 percent of farm households suffer from both income losses and debt increased during the last five years and about 11 percent exceed 40 percent of the debt-to-asset ratio.

Farm debts have been a major issue in Korea. Farmers and farm communities argue that a large farm debt is a *prima facie* case of government policy failure.[2] Among others, they highlight that inappropriate policy measures and directions are to be blamed and thus debt burdens must be shared or pardoned by the government. Whenever the blame game begins, issues of farm debts grab political attention and the government is forced to introduce a series of debt relief measures. Basic policy instruments have been debt pardons and interest rate reduction.

[2] In fact, farmers claim that actual level of farm debts is much larger than actual statistic figures.

IV. The Road Ahead from a Policy Perspective

1. Emerging Challenges from the Doha Round

Subsequent to the UR, the Doha Round yet to be completed will bring forth add-on challenges to farmers in Korea. Since many proposals tabled in negotiations thus far suggest deeper cuts in border protection and domestic support as well as more strict discipline than UR agreements, the Doha impact on farmers would be much harder and more substantial.

An empirical exercise was conducted to estimate potential impacts on agriculture by the Doha Round. Table 10 summarizes two scenarios, a fast reduction scenario, applicable to *developed countries*, and a slow reduction case for *developing countries* on the basis of Harbinson's revised paper.[3] The quantitative model used is the KREI-ASMO, a sector-wide forecasting model developed and used by the Korea Rural Economic Institute. The model incorporates 26 commodities, including rice, red pepper, garlic, and apple, which are deemed most harmed by greater market access.

Table 10. Scenarios for Policy Simulations

Fast Reduction Scenario				Slow Reduction Scenario			
Current Tariff (%)	Reduction Rates (%)		Period (year)	Current Tariff (%)	Reduction Rates (%)		Period (year)
	Average	Minimum			Average	Minimum	
> 90	60	45	5	> 120	40	30	10
15 ~ 90	50	35		60 ~ 120	35	25	
				20 ~ 60	30	20	
< 15	40	25		< 20	25	15	
				Special Products	10	5	

Source: WTO <http://www.wto.org>

[3] Harbinson is the chairman of the WTO agricultural negotiation committee and drafted the first and revised modality papers in February and March 2003, respectively.

Table 11. Deficient Amounts of Farm Income in 2010

Unit: 100 million won (Million US dollar)

Product	Farm Income (2000~02)	Fast Reduction Scenario		Slow Reduction Scenario	
		Farm Income (2010)	Deficient Amount	Farm Income (2010)	Deficient Amount
Rice	82,059 (6,838)	50,784 (4,232)	31,275 (2,606)	76,339 (6,362)	5,720 (477)
Red Pepper	10,260 (855)	6,988 (582)	3,273 (273)	9,266 (772)	995 (83)
Garlic	5,163 (430)	4,596 (383)	567 (47)	5,038 (420)	125 (10)
Apple	5,405 (450)	4,163 (347)	1,243 (104)	4,525 (377)	880 (73)
Total	102,888 (8,574)	66,530 (5,544)	36,358 (3,030)	95,168 (7,931)	7,720 (643)

Note: 1. The exchange rate is assumed as 1,200 won per US dollar.

2. Figures are calculated by the fixed areas and yields in the period 2000~2002.

Table 11 shows farm income deficiency between 2000~2002 and 2010. The total deficient amount of income is 3,030 and 643 million US dollars respectively for the two scenarios. Surprisingly, the income deficiency is mostly ascribed to rice farming, which accounts for more than half of total agricultural income. The rice sector would need 3,128 billion won or 2,606 million US dollars to keep up with the income level in the period of 2000~2002 under the fast reduction scenario. In short, these results highlight that the income effect of the fast reduction scenario would be too much and a chief concern for Korea to moderate the speed of tariff reduction in the DDA negotiations.

2. The Road Ahead

According to the OECD (2003b), the objectives of agricultural policies fall into two categories. One is concerned with incomes of farm households and the other is to address societal concerns such as food security and safety, the environment, and provision of rural amenities. The OECD research suggests that agricultural incomes should be approached by targeted direct income payments to households with a requirement of decoupling from production. It warns that sector-wide price support is ineffective and increases domestic burdens on consumers and taxpayers. Concerned with societal demands, the OECD recommends they be addressed at the source by compensating social benefits or

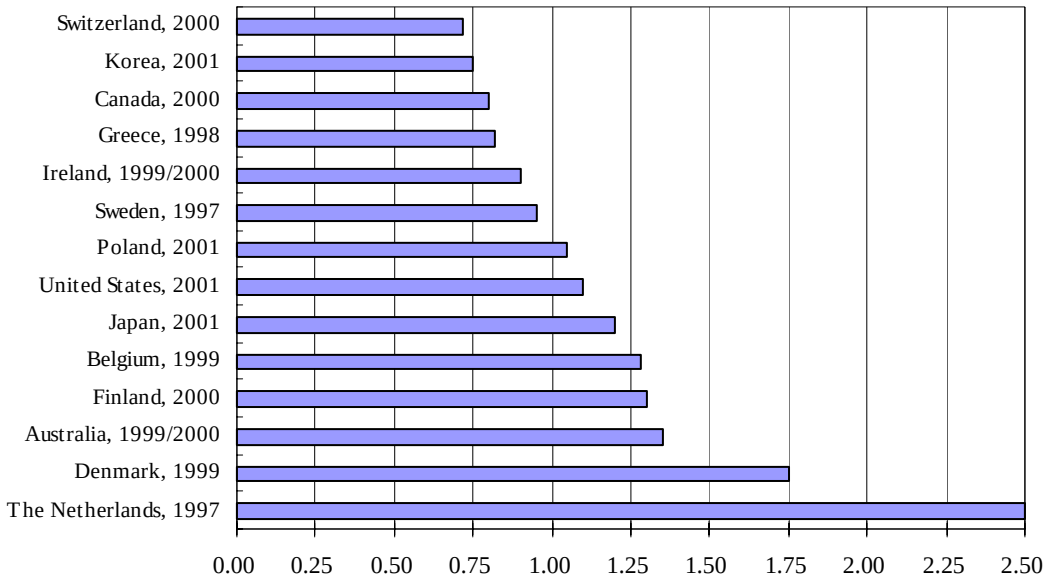
by charging social costs.

Direct Income Payments

The above positive reform agenda should be applied to agriculture in Korea. Foremost, it should address the concerns of low income farm households. As shown in Figure 12, unlike other OECD countries, farm household income in Korea amounts to only 75 percent of urban households, which could be aggravated by fast tariff reduction.

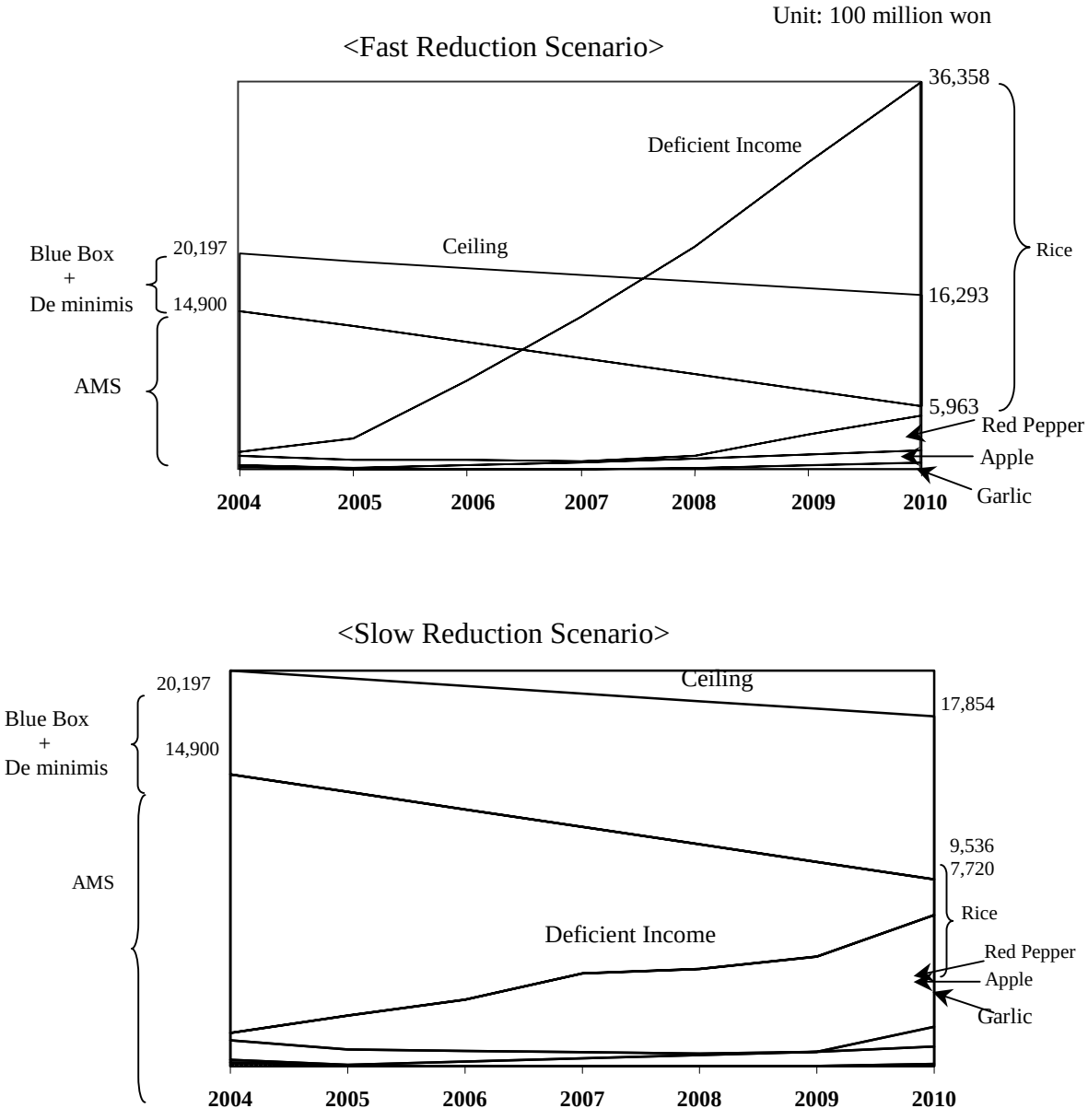
As revealed in the previous section, the direct payments required to compensate for farm income losses would be a great amount under the fast reduction scenario. Panel A of the Figure 13 illustrates how the ceiling of total coupled domestic support would be and the amount of direct support required for sustaining the income level per hectare for four major crops. For the purpose of illustration, let's assume, as proposed in the Harbinson's paper, the AMS ceiling is reduced by 60 percent, leading to a decrease from 1,490 billion won to 596 billion won. Further assume that the total sum of the AMS, the Blue Box and *de minimis* is cut by 30 percent to 1,629 billion won.

Figure 12. Farm Household Income Compared to the Income of All Households



Source: OECD (2003a).

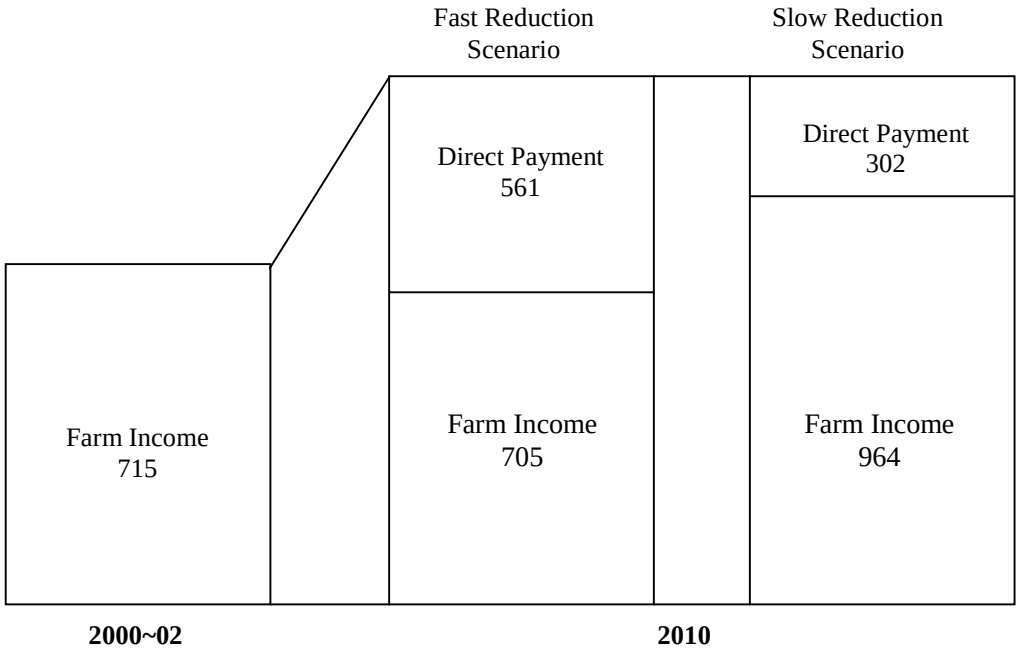
Figure 13. Direct Payments and Domestic Support Ceilings



Source: KREI (2003).

Figure 14. Equivalent Farm Income with Direct Payments

Unit: 10,000 won per farm worker



Source: KREI (2003).

The deficient farm income under the fast reduction scenario is so huge that direct payment amounting to 2,007 billion won or 1,672 million US dollars will be required for the four major crops even after exhausting the total ceiling of the AMS, the Blue Box and *de minimis*. On the other hand, the deficient farm income could be covered within the AMS ceiling in the case of the slow reduction scenario.

Consequently, in order not to expand the current income disparity with the non-farm sector, the direct payment per farm worker would be 5,610 thousand won (4,675 US dollars) under the fast reduction scenario and 3,020 thousand won (2,500 US dollars) under the slow reduction scenario in 2010 (Figure 14).

Some important policy implications can be drawn from the above results. First, a drastic cut in tariffs such as in the scenario applicable to *developed countries* is likely to require greatly increased direct payments. However, if the total amount of domestic support is reduced from current levels as assumed in the

fast reduction scenario, room for the needed income support would be taken away. In other words, beyond the financial feasibility, direct payments would be barred substantially by the ceiling of domestic support unless a large part of the direct payments could be decoupled so that they could be categorized as the Green Box by WTO rules.[4]

Second, since critical adverse impacts of increased market access are likely to fall on a limited number of high tariff products, a counter-cyclical form of support such as the Blue Box direct payment should be warranted at least in the short or medium run. Up to now, Korea has not used any Blue Box support. As Table 12 highlights, Korea is an abecedarian in taking advantage of any direct payment. The direct payments level including the AMS, de minimis and the Blue Box amounts to only 444 US dollars per agricultural population in 2000, which is far less than those of most other countries. Albeit coupled to price levels income support for rice only appeared in 2002 for the first time.

Among others, such a Blue Box-type of direct payment targeting rice farmers appears to be of great importance in the future. Its rationale can be summarized

Table 12. Direct Payments in Selected Countries

Unit: US dollars per agricultural population

Country	Year	AMS+de minimis+Blue Box (A)	(A)+Green Box
Australia	2000	148	983
Canada	1999	1,758	3,265
EU	1999	3,978	5,144
Iceland	2000	7,131	8,935
Japan	1999	1,639	6,679
New Zealand	2000	-	369
Norway	2001	8,982	10,926
U.S.A.	1999	3,784	11,532
Korea	2000	444	1,436

Source: WTO<http://www.wto.org>

[4] Decoupled support refers to the direct payments that are based on clearly defined and fixed historical measures such that they do not influence current or future production decisions (Baffes and de Gorter 2003).

as follows. First, the vulnerability of rice farms to further market liberalization would be so great that specific and targeted policy response should be ensured. Rice means almost everything to farmers in the country. As of 2002, about 77 per cent of total farm households are engaged in rice farming and 37 percent of gross agricultural receipts come from rice (MAF 2003a). Rice income represents about 25 percent of average farm household income, which is much higher than in Japan's case, less than 5 percent.

Second, beyond its economic leverage, the rice sector weighs heavily in terms of political significance and public sentiment. Rice farming has been a traditional token of agriculture and much of Korea's heritage throughout history. People take for granted that rice farming is the backbone of agriculture. It is therefore important for the government to make efforts to lessen sector-specific financial stress in terms of Blue Box payments.

Finally, Blue Box payments are also useful to smooth the path of structural adjustment in the sector. Rice cultivation is favored by older farmers since they are accustomed to the farming environment and have ample experience. Less labor requirement for rice farming is another advantage. Since about 53 percent of farmers today are older than 60 years, a transitory policy measure such as the Blue Box would contribute to paving the way for the rice sector to embody structural adjustment smoothly and agreeably. The fact that the United States and the European Communities adopted Blue Box payments before introducing fully decoupled direct income payments sheds light on a positive role of the measure during the transitory periods.[5]

Granted that there would be a ceiling on the Blue Box and a sharp reduction in support it would be inevitable for the country to adopt additionally the Green Box-type policy instruments for farm income. Decoupled form of income support is a step into the right direction and can be accepted as a useful means to redress income loss arising from both reduction in coupled support and greater market openness. It should be noted however that fully decoupled and targeted income support can not be a panacea. Depending on the degree of decoupling, decoupled support may even constitute the wide range of mechanisms such as insurance, wealth and expectation effects (OECD 2000; OECD 2001). Further to which, a fully decoupled payment may have to take the form of transitional adjustment assistance for farmers to adopt free markets (Beard and Swinbank 2001).

Korea will have to resolve falling farm income issues sooner or later. It is therefore important to take advantage of flexibility and transition room in

[5] The WTO member countries who have used the Blue Box at least once include the European Communities, the United States, Norway, Japan, the Slovak Republic, Iceland and Slovenia (UNCTAD 2003).

reduction of tariffs and domestic support, at least during the soft landing period. From a policy perspective, a 10 year span from now on will determine if the country is able to make a soft landing, with the parachute that developed countries have used extensively, in agricultural polices against new international environments.

Multifunctionality

Korea put a value on the multifunctional roles of agriculture such as food security, cultural and historical heritage values, environmental services, rural viability and agricultural landscapes (OECD 2001b; Romstad et al. 2000). In particular, food security has been the most important objective in agricultural policies (Lim 2002; Kang and Lim 2002). Park and Kim (1999) shows that 73 percent and 48 percent of 1,000 people surveyed ranked the provision of stable food supplies and environment protection are the most important roles of agriculture, respectively in selecting two priorities. Employing a willingness-to- pay methodology Oh, Kim and Kang (2001) estimated the monetary value of multifunctionality as 4,336 billion won or 3.6 billion US dollars. Eom et al. (1993) presents a monetary estimate of public benefits provided by rice paddy fields as 10,409~13,437 billion won or 8.7~11.2 billion US dollars in terms of a replacement cost method.

A policy response to such a strong societal preference and demand for agricultural multifunctionality has been at most modest-except that the objective of food security has traditionally dealt with price support measures. It was not until 1999 that the government introduced a scheme for environmentally friendly farming.[6] In 2001, direct payments for rice paddy fields were set out to compensate multifunctional services primarily induced by reduced use of fertilizers and pesticides and maintenance of paddy field levees was regarded as an important element of water management (Lim 2003). Another type of direct payment was launched to support farms that complied with environmentally friendly farming. A new pilot agri-environmental measure for the livestock sector is being adopted in 2004 and begins to address the reduction of livestock wastes and control of animal numbers.

Environmentally friendly farming in Korea is more or less on the verge of an upwards trend. The limited number of environmental schemes and lack of

[6] Even before 1999, there were several policy measures to reduce agricultural pollution and livestock waste. However, 1999 was a milestone for the government when they began to effectively introduce an array of agri-environmental measures. Also note that the government proclaimed the year of 1998 as the first of an era of environmentally friendly farming on November 1998.

capacity should not be a bottleneck for encompassing a variety of public goods jointly produced by farming. It is noteworthy that the European Union runs a number of second pillar measures such as rural development and agri-environmental programs promoting the so-called 'the European Model of Agriculture'.

As long as the rule of Tinbergen is valid and acceptable, Korea needs to develop diverse policy instruments to embody the valued multiple features provided by farming activities.[7] One of them would be regional aids for areas with structural disadvantages whose rural viability is of great importance. Ways to preserve agricultural landscapes must be sought with non-governmental options such as market creation and voluntary provision. Greater attention should be given to the polluter-pays-principle as well as the provider-gets-principle that correct market failures and under-provision of public goods. For example, the former could be realized by introduction of environmental taxes on fertilizers and pesticides while the latter by paying farmers for the provision of non-commodity output exceeding the reference level or good farming practice.

In the medium or long run, it is advisable to establish the so-called Regional-based Total Maximum Load System (RTMLS) for agriculture. The RTMLS aims to maintain equilibrium between absorptive capacity of the environment and agricultural pollutants on the basis of regions. Accompanied by a production quota for livestock, if needed, and integrated pesticide and nutrient management practices, the system will pursue to stabilize agricultural eco-systems and achieve a material balance.

A challenging task regarding a pursuit of agricultural multifunctionality is to introduce and implement carefully targeted policies so as to be harmonious with the WTO requirements. However, targeting or increasing precision defined as the degree to which the intended policy goals are attained concurs with transaction costs such as information gathering, contracting, controlling and policing for attaining intended results. In the case of positive transaction costs targeted direct payments can be very costly and even not a rational choice (Vatn 2001).

Although the transaction costs associated with direct payments appear to be a subject of empirical measurement, they deserve to be paid close attention in a practical manner. Many small-scaled farms with diverse jointly produced public goods represent a complex agricultural structure in Korea. In this situation, the transactions costs for a separated approach that creates private markets and focuses on each public good separately would be prohibitively high. Instead, an

[7] The rule of Tinbergen stipulates that that a government must have as many policy instruments as declared policy objectives (Tinbergen 1950).

integrated approach dealing with private and public good as a package would be a better choice (Vatn 2001). Measures with cross compliance could be also encouraged.

To summarize, a viable and rational measure for multifunctionality must contribute to reduction in production and transactions costs upholding the gains of jointness and increased quality of goods. As a type of integrated approach, direct payments for rice paddy in the base year can meet the requirements. A remaining task is to sharpen compliance.

Structural Adjustment

Making a move toward trade liberalization under the WTO has been an important binding pressure for the agricultural sectors to bear with structural adjustment. A series of large public investments have focused on agricultural restructuring and structural improvement. At the same time, farmers themselves played a pivotal role to advance farmland transfer and develop large-scaled capital intensive production systems.

Successful structural adjustment requires a complementary relationship among the markets, governments, and private sectors. Firstly, the government must seek to ensure orderly market functions and address market failures. Attempts by the government to control supply and demand tend to wind up with incurring social costs in many cases. Well established and functioning markets can be an effective driving force for structural adjustment. It is therefore time for the government to examine the possibility of abolishing the rice purchase scheme, minimum price support for vegetables and subsidies for orchard closures.

Secondly, entry barriers attached to farmland must be removed. Once deregulated, farmers would enjoy the freedom to rent or lease their farmland and exit agriculture. Farmland conversion to other purposes can be further facilitated with an abolishment or reduction of conversion fee, amounting to 20 percent of the land price, as far as such a conversion does not deteriorate the area’s environment and landscape. Limits for farmland ownerships and investments by non-farmers must be released, as well.

The creation of a Farmland Bank will further assist farmland mobilization. Under the expectation that about 65 percent of the older farmers who are now over 60 years of age would retire from farming in 10 years, the Farmland Bank can play an important role as a facilitator. The Bank may obtain farmland from farmers who retire or leave from farms and sell or rent it to other farmers. It also may participate in land development activities by converting marginal or abandoned farmland into land suitable for non-agricultural use then sell it.

Finally, the government should endeavor to explore new markets, establish efficient marketing systems and invest in information systems and technology development. Developing new markets call for market research, campaigns and promotions and new value-added products. Innovative marketing systems stem from well-functioning cooperatives and producers' organizations who want to develop local marketing centers. The monitoring and information system is a prerequisite to respond to rapidly changing consumers' demands and market dynamics. As a backbone of agricultural growth, the R&D investments contribute not only to technology improvement but also to new technologies such as new material and biotechnology.

V. Conclusions

A common and fundamental agricultural problem arises from the fact that agricultural production and employment have been structured differently over the path of economic development. As economic development proceeds, shares of agricultural production and employment in the whole economy tend to decline. However, low job mobility from agricultural to non-agricultural sectors renders a skewed agricultural employment structure where older farmers are accumulated and thus its reduction must rely upon mostly natural factors such as death and retirement. Slower adjustment in agricultural employment widens a productivity gap as well as an income disparity between agricultural and non-agricultural sectors.

Facing this agricultural problem developed countries have tailored different policy instruments over the stages of economic development. In the early years of economic development agricultural protection and market price support were adopted to overcome lagging productivity in agriculture. Partly because of a positive influence by the growth of non-agricultural sectors, developed countries were able to enhance agricultural productivity during the course. When domestic policy disciplines set their ways through the trade agreements of the 1990s, developed countries managed to change their border protection and market price support regimes into various schemes of direct payment including the Blue Box type. Since they pursued structural adjustment in agriculture over a long period, policy transformation resulted in modest costs.

This is not the case for developing countries being inclusive of Korea. Prohibition of agricultural protection and domestic support by the WTO regulations is imposing substantial costs on developing countries in the sense that they have to bear with drastic changes in agricultural structure in a relatively short period. As highlighted by the econometric analysis for Korea, the lagged productivity and the skewed form of demographic distribution in the agricultural sector would hardly lead the country to accommodate fast reduction of tariffs and domestic support.

This is why Korea needs room for policy flexibilities and adjustment periods. As developed countries have enjoyed a privilege in adjusting their agricultural structure under border protection and domestic support for a long period in the past, Korea needs a period of transformation for its soft landing. It is therefore suggested that Korea have additional policy cushions for a period of 10 to 20 years with a slower reduction of protection and domestic support to be warranted

under the WTO agreements. This would be a way to create a level playing field in the international trade regime.

Finally, the Korean case would be seen as exemplary for other developing countries in pursuit of economic growth and development. It underlines the emergence of the agricultural problem at a certain stage of economic development, such as accumulation of older farmers and productivity and income disparities between agricultural and non-agricultural sectors. To ensure a soft landing, they should be ready to exercise prudent policies with secured adjustment periods. It is not fair to take away the parachute which developed countries used for their soft landing for such a long time.

요 약

빠른 경제성장 속에서 한국농업은 커다란 변화를 겪어 왔다. 다른 선진국과 비교하면 생산구조는 3~7배나 빠른 속도로 변해왔으며, 고용구조 또한 외국과 비교할 수 없을 만큼 급격하게 진행되었다. 노동시장의 특성상 다른 나라에서와 마찬가지로 농업취업자의 전직이 매우 제한적이어서 이러한 급격한 고용구조의 변화는 주로 신규취업자의 급격한 감소에 의하여 이루어질 수 밖에 없었으므로 농업취업자의 50% 이상이 60세 이상일 정도로 고령층이 누적된 형태로 나타났다. 그러나 이러한 연령구조는 앞으로 세대교체가 빠르게 이루어질 수 있음을 의미하므로, 10~20년 사이에 우리나라도 선진국 수준의 농업구조에 안착할 수 있을 것으로 전망된다. 이러한 연착륙이 가능하도록 시장 개방과 국내보조금의 감축 속도를 조절하는 것이 매우 긴요하다.

1990년대에 시행한 다양한 농업정책은 자본축적과 대농 계층으로의 농지 집중 등 구조개선을 촉진시켜 생산성을 큰 폭으로 향상시켰다. 대농의 규모확대는 대부분 임대차를 통해 이루어져 자작농 중심 구조에서 차지농 구조로 빠르게 전환되고 있다.

투자와 생산성 증대로 농업부문이 성장하고 있지만 농업소득이 신장되지 못하는 이른바 성장과 소득의 괴리 현상이 나타나고 있다. 농가소득이 평균 가계소득의 75%에 그치고 있고, 33%의 농가가 지난 5년 연속 소득감소를 겪고 있는 가운데 5분위 소득 격차가 7.1배에 이르고 있다. 이 같은 계층 격차는 전직은 물론 생산성 향상을 이루기 어려운 노령 영세농의 소득이 명목으로 감소하고 있기 때문이다.

한국농촌경제연구원의 KREI-ASMO 모형에 따르면 WTO 협상결과 선진국 수준의 감축 의무를 이행할 경우 2010년에 가서는 3조 6,583억 원의 소득 보상 직접지불이 필요할 것으로 추정됐다. 곧 블루박스와 그린박스 형태의 직접지불에 대한 엄청난 수요가 발생한다. 농업부문이 이처럼 급진적인 시장개방에 노출되고 소득보조에 엄격한 제한이 가해진다면 농가경제가 붕괴될 위험에 놓일 수 있다.

선진국은 농업에 대한 국제 규범이 마련되지 전에 이미 국경조치와 가격보조 정책을 통해 농업구조를 개선해 온 반면에 우리나라는 이러한 농업보호 조치들이 규제되는 가운데 농업구조를 전환해야 하는 어려움에 직면해 있다. 이에 따라 우리 농업부문의 연착륙을 위해서는 블루박스 형태의 직접지불을 통해 품목 특정적인 소득 보상이 필요하다. 이는 지금까지 선진국이 누려왔던 농정 신축성을 우리나라와 같은 개도국들에도 보장함으로써 공정한 WTO 규범을 설정하고 이행하는 것이 될 것이다.

끝으로, OECD의 권고처럼 시장기능의 확충과 농업의 구조조정이 지속돼야 할 것이다. 또한 다원적 기능의 틀 안에서 농산물과 영농활동을 통해 제공되는 농업의 공공 서비스를 대상으로 통합적인 정책 조치를 도입함으로써 거래비용을 줄이고 정책 효과를 높이는 접근방식이 필요하다.

REFERENCES

Baffes, John and H. de Gorter. 2003. 'Decoupling Support to Agriculture', Paper presented at the Annual Bank Conference on Development Economics-Europe, Paris, May 15~16.

Beard, N. and A. Swinbank. 2001. 'Decoupled Payments to Facilitate CAP Reform' *Food Policy* vol. 26: 121-145.

Beierle, Thomas C. 2002, 'From Uruguay Round to Doha: Agricultural Trade Negotiations at the World Trade Organisation', Discussion Paper 02-13, Resources for the Future, Washington, DC.

Choi, S.K., S.S. Lim and M.K. Eor. 2002. 'Comparison of Agricultural Tariff Structure and Impacts of Tariff Reduction', Research Report R-448, Seoul: Korea Rural Economic Institute (in Korean).

Eom, K., S.H. Yoon, S.K. Yoon, D.S. Kim. 1993. 'Public Services of Rice Paddy Fields,' *Journal of Korea Soil and Fertilizer* 26(4):314~33 (in Korean).

Kang, J.I. and S.S. Lim. 2001. 'Korean Agriculture into the New Millennium', In *Korea's Economic Prospects: From Financial Crisis to Prosperity*, edited by O.Y. Kwon and W. Shepherd, Edward Elgar Publishing, Inc., Cheltenham.

Kim, C.G. and J.H. Kim. 2002. 'Development Strategies for Sustainable Agriculture', Research Report C2002-13, Seoul: Korea Rural Economic Institute (in Korean).

Korea Rural Economic Institute [KREI]. 2004. Agricultural Outlook 2004, Research Report M54, Seoul: Korea Rural Economic Institute (in Korean).

KREI. 2003. 'Vision and Policy Directions for Agriculture and Rural Societies', Research Policy Report P-62, Seoul: Korea Rural Economic Institute (in Korean).

KREI. 1999. *Agriculture in Korea*, Seoul: Korea Rural Economic Institute.

Lee, Jung-Hwan. 2002. 'Korean Experience with Structural Adjustment in Agriculture: Issues and Prospects,' in *Structural Adjustment in Agriculture in Asia and the Pacific*, Tokyo: Asian Productivity Organization.

Lee, Jung-Hwan. 1998. 'Transformation of Agricultural Structure: From Beginning to End', Research Monograph No. 21, Seoul: Korea Rural Economic Institute (in Korean).

Lee, Jung-Hwan and B. I. Ahn. 2002. 'Scale Enlargement in Rice Farming: Is This an Effective Alternative to Market Opening', *Korean Journal of Agricultural Economics* 43(3):57-75 (in Korean).

Lim, Song-Soo. 2003. 'Indicators for Agricultural Landscapes and Policy Implications: A Korean Perspective', In *Agricultural Impacts on Landscapes: Developing Indicators for Policy Analysis*, edited by the Norwegian Institute of Land Inventory, NIJOS rapport 7/03, Oslo.

Lim, Song-Soo. 2002. 'Non-Trade Concerns in the WTO Negotiations', Research Report C2002-39, Seoul: Korea Rural Economic Institute (in Korean).

Lim, Song-Soo and S.H. Kim. 2003. 'Debates and Rationale for Developing Country Status in the WTO', Research Policy Report P-60, Seoul: Korea Rural Economic

Institute (in Korean).
Ministry of Agriculture and Forestry [MAF]. 2003a. *2003 Key Agricultural Statistics*, Gwacheon: Ministry of Agriculture and Forestry (in Korean).
MAF. 2003b. *2003 Annual Report for Agricultural Policies*, Gwacheon: Ministry of Agriculture and Forestry (in Korean).
OECD. 2003a. *Agricultural Policies in OECD Countries: Monitoring and Evaluation*, Paris.
OECD. 2003b. Agricultural Policies in OECD Countries: A Positive Reform Agenda, *Policy Brief*, June 2003, Paris.
OECD. 2003c. *Farm Household Incomes: Issues and Policy Responses*, Paris.
OECD. 2002. *Agriculture and Trade Liberalization: Extending the Uruguay Round Agreement*, Paris.
OECD. 2001a. *Agricultural Policies in OECD Countries: Monitoring and Evaluation*, Paris.
OECD. 2001b. *Multifuctionality: Toward an Analytical Framework*, Paris.
OECD. 2000. 'Decoupling: A Conceptual Overview', COM/AGR/APM/TD/ WP(2000)14/FINAL
Oh, S.I., S.S. Kim and C.Y. Kang. 2001. 'Valuation of Multifunctionality of Agriculture', Research Report, Seoul: Korea Rural Economic Institute (in Korean).
Romstad, E., A. Vatn, P.K. Rorstad and V. Soyland. 2000. Multifunctional Agriculture: Implication for Policy Design, Report No. 21, Department of Economics and Social Sciences, Agricultural University of Norway.
Shirotori, Miho. 2002. 'WTO Negotiations on Agriculture: The 13th Special Session on Agriculture-Market Access: Chairman's Oral Summary', Report to the United Nations Conference on Trade and Development, September 6, Geneva.
Tinbergen, J. 1950. *On the Theory of Economic Policy*, Amsterdam, North-Holland.
United Nations Development Programme [UNDP]. 2003. *Making Global Trade Work for People*, London: Earthscan Publications Ltd.
United Nations Conference on Trade and Development [UNCTAD]. 2003. An Analysis of the Agricultural Domestic Support under the Uruguay Round Agreement on Agriculture: The Blue Box. UNCTAD/DITC/COM/2003/6.
Vatn, Arild. 2001. 'Transaction Costs and Multifunctionlity', presented in the Workshop on Multifunctionality, Paris, 2-3 July.

[i] Tariff peaks

[4] Decoupled support refers to the direct payments that are based on clearly defined and fixed historical measures such that they do not influence current or future production decisions (Baffes and de Gorter 2003).

[iii] The WTO member countries who have used the Blue Box at least once include the European Communities, the United States, Norway, Japan, the Slovak Republic, Iceland and Slovenia (UNCTAD 2003).

[iv] Even before 1999, there were several policy measures to reduce agricultural pollution and livestock waste. However, 1999 was a milestone for the government when they began to effectively introduce an array of agri-environmental measures. Also note that the government proclaimed the year of 1998 as the first of an era of environmentally friendly farming on November 1998.

[v] The rule of Tinbergen stipulates that that a government must have as many policy instruments as declared policy objectives (Tinbergen 1950).

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THE ROAD AHEAD FOR KOREAN AGRICULTURE
Soft Landing on a New Plateau in the WTO

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발행인 이정환
발행처 한국농촌경제연구원
130-710 서울특별시 동대문구 회기동 4-102
전화 02-3299-4000 팩시밀리 02-965-6950 http://www.krei.re.kr
인쇄처 (주) 문원사 02-739-3911～5