The Implications of Korea’s Experience for Developing Agriculture Value Chains in Africa
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AFRICAN DEVELOPMENT BANK (AfDB) GROUP
© African Development Bank 2018
African Development Bank
Avenue Joseph Anoma
01 B.P. 1387 Abidjan 01
Côte d’Ivoire
Phone: (+225) 20 26 10 20
Fax: (+225) 20 21 31 00
www.afdb.org
Acknowledgements

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Korea’s economic transformation from a poor country with low per capita income in the 1960s into one of the biggest economies in the world within a single generation is undoubtedly remarkable. Many similarities exist between pre-industrialised Korea and many African countries today in terms of challenges and latent opportunities. As the African Development Bank continues to support its Member States to achieve socio-economic progress, Korea is clearly one of the continent’s most influential and credible advisors on this journey.

A successful green revolution was the precursor to industrialisation in Korea. Transformation could not have been achieved without the focus on agricultural transformation, through its popular village model, Saemaul Undong. This approach increased agricultural productivity to achieve food self-sufficiency through massive support for technologies that escalated production, investments in rural infrastructure, rural electrification and rural telecommunications.

The African Development Bank’s Feed Africa Strategy aims to help end extreme poverty, eliminate malnutrition, end dependency on feed imports and move Africa to the top of the value chains in areas of its comparative advantage. It focuses on increasing agriculture production and productivity, boosting investments in enabling infrastructure and creating an enabling agribusiness environment while ensuring inclusivity, resilience and sustainability.

Given these goals, this study is a timely move by the Bank to deepen the collective understanding and insights into Korea’s agricultural transformation particularly the policy implications, investment, capacity building requirements as well as other lessons learnt that can be implemented in Africa. It provides vital information for informed decision-making by the African Development Bank, its Regional Member Countries and other development stakeholders in the agricultural space.

MARTIN FREGENE
Director, Agriculture and Agro-Industry Department
African Development Bank
ACRONYMS

ACE       Agricultural Commodity Exchange, Malawi
ADMARC   Agricultural Development and Marketing Corporation, Malawi
AHCX      AHL Commodities Exchange, Malawi
ADB       Asian Development Bank
AfDB      African Development Bank
AID       Agency for International Development (United States)
ALRC      Agricultural Land Re-arrangement and Consolidation
AMRI      Agriculture Mechanisation Research Institute (Government of Korea, 1979-2004)
APR       Annual Percentage Rate
aT        Korea Agro-Fisheries and Food Trade Corporation
DSC       Drying and Storage Complex
EPI       Export Promotion Industrialisation
FAO       Food and Agriculture Organisation of the United Nations
GAP       Good Agricultural Practices
GOK       Government of Korea
HMR       Home Meal Replacement
IBRD      International Bank for Reconstruction and Development
IFPRI     International Food Policy Research Institute
ILO       International Labour Organisation
IRRI      International Rice Research Institute
ISI       Import Substitute Industrialisation
KAFACI    Korea-Africa Food & Agriculture Cooperation Initiative
K-Biz     Korea Federation of Small- and Medium-sized Enterprises
KOSIS     Korea Statistical Information Services
KRC       Korea Rural Community Corporation
LAI       Leaf Area Index
LBS       Location-Based Services
MMA       Minimum Market Access
MOAF      Ministry of Agriculture and Forestry (Government of Korea, 1948-1973)
MOAFFRA   Ministry of Agriculture, Forestry and Rural Affairs (Government of Korea)
NFRC      Near-Field Communication
NH, NACF  Nonghyup (National Agricultural Co-operative Federation)
NIAS      National Institute of Agricultural Sciences (Government of Korea)
OECD      Organisation for Economic Co-operation and Development
OECF      Overseas Economic Co-operation Fund (Japan)
OEM       Original Equipment Manufacturing
RDA       Rural Development Administration (Government of Korea)
RMC       Regional Member Country
RPC       Rice Processing Complex
SAP       Structural Adjustment Programme
SME       Small- and Medium-sized Enterprises/Companies/Businesses
SMU       Saemaul Undong (New Village Movement)
SSA       Sub-Saharan Africa
TVET      Technical and Vocational Education and Training
UNDP      United Nations Development Programme
URAOA     Uruguay Round Agreement on Agriculture
Sub-Saharan African countries have been seeking ways to improve their economies, particularly as problems of malnutrition, poverty, and unemployment continue to plague the people. The challenges that most of the countries face on the continent resemble the challenges that some of the Asian countries have faced. South Korea (hereinafter, Korea), in particular, fundamentally faced similar issues in the 1950s and the 1960s. However, Korea was able to overcome these challenges and not only attain self-sufficiency in staple cereals but has developed into an economic powerhouse. This study traces the success factors in the path of Korea’s agricultural development in three chronological stages: the quest for rice self-sufficiency period (1962-1977), the post-rice self-sufficiency period (1978-1994), and the period of the enhancement of global competitiveness (1995-present).

The first stage—the quest for self-sufficiency in rice—was attained through comprehensive collaboration with both the Korean government and institutions that were established each step of the way, and of course, with private sector stakeholders as well as the farmers themselves. Goals of this period were to achieve rice self-sufficiency and to increase rural household income. Highlights of this first stage are:

• The development of a new rice variety by researchers dispatched to the International Rice Research Institute;
• Efforts to breed and distribute this new rice variety, called the Tong-il type;
• Fertiliser subsidy policies and the expansion of local and national fertiliser production;
• The development of strategic 5-year plans with specific agriculture sector policies;
• The development and enhancement of an extension service system, operated by Nonghyup (NH); and
• The Saemaul Undong (SMU) Movement that was created to reform the mindset of villagers in concert with the development of the agricultural sector.

The second stage—the post rice self-sufficiency period—was characterised by fundamental changes in the government policies to address the changes that have taken place in the internal and external environment of the agricultural sector while accelerating the transformation process of the sector. Furthermore, consumers were now concerned with the taste of the rice, finding the Tong-il varieties less palatable than what they were accustomed to with the traditional rice. Thus, the second stage was characterised by the following:

• Increasing importance of consumer demand;
• The opening of the Korean agricultural market to foreign agro-products;
• Decreasing demand for fertiliser forced manufacturers to diversify their production and export fertiliser;
• The government began an agricultural land re-arrangement and consolidation (ALRC) plan to combine dispersed and fragmented properties;
• The promotion of agro-mechanisation;
• The establishment of rice processing complexes (RPCs) in the rural space;
• A significant change in the demographics of the population—the outflow of a young labour workforce from the rural areas to the urban areas as well as an increase in the female population with a decrease in the male population;
• The establishment of SMU factories; and
• The agro-industrial complexes.

The third stage—the period of the enhancement of global competitiveness—is where Korea currently is today. This period is characterised by the following:

• Continued efforts on the strengthening of the agro-value chain activities;
• A declining trend of rice consumption;
• Expansion of vinyl greenhouses to meet the demand for fresh produce, with support for modernisation plans from the government;
• A change in the gravity of value chain activities shifting from manufacturers to consumers;
• The influence of technology in the growth of the market, including access of information; and
• Creating a fund of seed money to grant to start-ups (small- and medium-sized enterprises).

While Korea and SSA countries differ in their political circumstances and while the market certainly is different now than it was 50 to 60 years ago, both Korea and SSA countries share some similarities: small-holder farmers, subsistence farming, poverty, food insecurity and the need for economic and income growth. This study utilised desktop review and analysis of Korea’s experience as well as information gathered from field visits to Malawi and...
Senegal to determine what key transferrable lessons can be drawn from Korea’s experiences:

- Utilise the model of collaboration between NH and the Korean government to come up with a similar model between SSA country governments and an entity such as NH;
- Revamp the fertiliser distribution system;
- R&D and breeding need to focus on more than just yield, and perhaps can use farmers’ input as well as consumer opinions;
- Reform and revamp extension and advisory services;
- Build technical and managerial capacity adapting SMU for SSA countries;
- Ensure that all government sponsored programs incorporate ownership and stewardship of the villagers;
- Encourage the growth of SMEs to participate in agriculture markets; and
- Develop plans to expand arable land areas and land-related policies with respect to infrastructure and irrigation.

Agricultural development, the attainment of rice self-sufficiency in particular, was the outcome of concerted efforts of all stakeholders involved. The government played an especially decisive role in designing and implementing detailed strategies and policies that private sector actors helped translate into actions. It is important to note, however, that agricultural transformation is an ongoing process as new types of challenges repeatedly arise to pose threats to agriculture and those who work in the industry. Furthermore, climate change calls for environmentally friendly farming techniques and associated technologies.
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Sub-Saharan Africa (SSA) faces such challenges as food insecurity, malnutrition, and unemployment in its path towards economic development, leading to difficulties in income creation for a large share of the population. African governments and the African Development Bank (AfDB) have been working to deal with these challenges and improve food security on the continent by 2025. One area of focus is the agricultural sector, the mainstay of most countries in sub-Saharan Africa. Agricultural productivity is yet insufficient to sustain the rapid expansion of urbanisation and population growth. As a result, net food import—at US$35 billion in 2015—is increasing at a rapid rate.\(^1\)

In 2016, the AfDB launched the *Feed Africa: Strategy for Agricultural Transformation in Africa, 2016-2025* report to improve Africa’s agricultural sector and achieve self-sufficiency as well as develop an improved value chain for export commodities such as cocoa, coffee, cotton, and cashew.\(^2\) Target commodities included rice, wheat, fish, palm oil, horticulture, cassava, maize, and soybean as well as products from the Sahel such as sorghum, millet, and cowpea. These commodities were identified as those that do not simply enhance economic growth but as the key crops that will help transform the countries into export-driven economies from the current net importing positions.

A select number of Asian countries with agricultural economies have been able to overcome economic challenges, progressively raising household incomes and improving not only food insecurity but also their economic conditions. One of these countries is the Republic of Korea (or South Korea, hereinafter referred to as Korea). Korea’s agricultural sector in the 1960s suffered from low productivity and the country was in poverty. However, in the 1960s, the government decided to implement initiatives that transformed the agricultural sector and successfully boosted the country’s economy over the next decade.

The primary objective of this study is to draw relevant lessons from the successes of Korea’s agricultural sector development and to assist in the development of an effective commodity value chain in Africa, with the intent to help ameliorate poverty and associated challenges arising on the continent. The goal will be to reflect on the lessons learned through the Korean experience in addressing the challenges outlined in the *Feed Africa: Strategy for Agricultural Transformation in Africa* report. To be more specific, the study is guided by the following interrelated objectives:

1. To identify and document Korea’s efforts in developing agricultural commodity value chains in light of Africa’s agricultural sector challenges, including the institutional formation, associated policies and action plans/programmes that actually contributed to raising the income level of Korea’s agricultural sector;

2. To elaborate on the Korean experiences that can help develop Africa’s agricultural commodity value chain activities—especially, in terms of the roles of the government and relevant stakeholders (including private-sector actors), policy measures, action plans, practices and programmes that are pertinent to the improvement of the sector’s value chain activities; and

3. To identify areas of the agricultural value chain where the Bank can create meaningful policies and/or programme interventions.

1. **Context and Background**

While the agricultural sector in sub-Saharan Africa employs about 60-70% of the workforce, countries on the continent are largely dependent on external sources, such as imports, food aid, and the like. For example, the total grain import in Africa in terms of total grain consumption increased today to more than 25% from about 5% in 1961. Food aid has also seen a 10% increase in the same amount of time.\(^3\)

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\(^2\) Ibid., p.v.

In the face of challenges such as poverty, food insecurity, as well as the price volatility of natural resources and increasing urbanisation, African countries need to transform their agricultural sector to address these challenges and develop their economies. The AfDB has engaged in analysing the challenges and set forth strategies to address these issues in their *Feed Africa: Strategy for Agricultural Transformation*. The goal is to end hunger and malnutrition, contribute to eliminating extreme poverty, and make Africa a net food exporter by 2025.

Similarly, in the 1950s, agriculture was the mainstay of the Korean economy while the country suffered from low productivity and poverty. Furthermore, like farmers in SSA countries, most Korean farmers were small-holders. As a response to these challenges, in the 1960s, the Korean government engaged in the creation and implementation of initiatives that would promote manufacturing and agriculture in attempts to improve the country’s economy. With these efforts came the introduction of a high-yielding rice variety called Tong-il (meaning “unification” in Korean) along with concomitant policies to support the agricultural sector.

A key policy among those was a two-tiered price system designed specifically for the government purchase of Tong-il yields. The government’s purchase of rice from the rural areas increased food security and income levels for the rural population. On the other hand, selling rice at low prices in urban areas maintained low food inflation rates which enabled urban wage levels to be kept low. This supported the growth of Korea’s manufacturing sector as low wage levels were a key component of Korea’s competitiveness in the early days of industrialisation. The following results of these policies in the 1970s was dubbed the “Green Revolution,” and in 1974, perhaps for the first time in Korean history, rural area household income exceeded urban household income.

Despite the inherent differences in factors surrounding the circumstances between Korea’s and SSA countries’ impetus to jump-start agricultural growth, it is worthwhile to examine Korea’s efforts and draw out some lessons that can be applied to the development of the agricultural sector in sub-Saharan Africa. The differences in agricultural conditions such as soil quality, crop species, and climate aside, agricultural support policies, agro-processing technology, financing schemes and models, and other physical and institutional infrastructure elements certainly possess some valuable lessons to consider. Moreover, Korea’s policy experiences in price stabilisation, export promotion, market access enhancement, food safety certification and the like, will also be a helpful source of reference for the development of agricultural support policies in African countries, particularly as Korea’s agricultural policies were fundamentally designed to support small-holders, the prevailing type of farmers in both Korea and SSA countries.

The transformation of the agricultural sector in Korea is still an on-going process, the outcome of which has largely been shaped by the vigorous responses of all stakeholders to each of the formidable challenges that arose. The transformation of the agricultural sector in Korea can be portrayed through three periodical stages. Rice self-sufficiency was the primary challenge in the first period (1964-1977). Increasing rural household income to continue the momentum of agricultural transformation was the main challenge in the second period (1978-1994). Drastic changes in the global trade environment arising from the commencement of the terms and conditions of the World Trade Organisation (WTO) under the Marrakesh Agreement that was accepted and signed by 124 nations including Korea is the daunting challenge in the third period (1995-present). The domestic rice market could no longer be protected but was open to competition as a result of the agreement.

Undoubtedly, the Korean government’s policy and strategic responses changed according to each of the challenges that arose with the changes in the environment. This in turn impacted stakeholders who then had to adjust their goals and behaviours in order to adapt to the concomitant environmental upturns. Consequently, value chain activities changed over time in line with the corresponding time periods of transformation in the Korean agricultural sector.

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4 The Tong-il variety herein refers to a new variety of rice, IR667 (Suwon 213), the first hybrid of the Tong-il varieties. The hybrid was formally named Tong-il and was introduced to the field in 1972. Thus, its yield is expressed as “Tong-il rice.” The cultivars subsequently introduced through cross-breeding—the progeny of the first hybrid—are collectively referred to as the “Tong-il type varieties.”
2. Research Methods

Based on the aforementioned, this research study examined the agricultural sector’s transformation in Korea, mainly the policy, strategy, and institutional changes that shaped the structure of the agricultural value chain and its activities over time. This study conducted a historical analysis of the agricultural sector’s development, beginning in the 1960s, utilising archival information and literature reviews.

Field interviews with key stakeholders were also conducted in Senegal and Malawi to gather information regarding the current development status of the agricultural sector in these countries. The main objective for visiting these countries was to identify the developmental bottlenecks of agricultural value chains and to evaluate the economic conditions and policy directions for comparison with Korea’s experience. Furthermore, these countries were selected purposefully to gather information from countries located in different regions of the continent and also because they would provide a common starting point for comparison and application of lessons learned as consumers of rice, among other staple crops. Research questions focused on the key areas of production, inputs, processing, distribution and sales, and the cross-cutting areas (infrastructure, finance, and farmers cooperatives) of a value chain.

Stakeholders identified in Malawi were as follows:

- World Bank
- FAO
- National Food Reserve Agency (NFRA)
- Bwanje Agricultural Co-operative
- Agricultural Trading Company, Ltd.
- Ministry of Agriculture, Irrigation, and Water Development
- ADMARC
- AHCX

Stakeholders identified in Senegal were as follows:

- The Africa Rice Centre (ARC)
- Compagnie Agricole de Saint-Louis du Sénégal (CASL)
- Institut Sénégalais de Recherches Agricoles (ISRA)
- Comité interprofessionnel du riz (CIRIZ)
- West Africa Rural Foundation (FRAO)
- Korean International Cooperation Agency (KOICA)
- Ministere de l’Agriculture de l’Equipement Rural
- Centre d’Initiation et de Perfectionnement dans les Metiers de l’Agriculture) de Saint Louis (CIPA)
- African Development Bank
II. THE FIRST PHASE OF AGRICULTURE TRANSFORMATION IN KOREA: ATTAINING RICE SELF-SUFFICIENCY

1. Background of Korea’s Green Revolution

Korea (South Korea) today, with a per capita GDP of US$30,000, is known as a global economic power-house based on its exports of manufactured products whose aggregate output exceeds US$1.5 trillion. However, it was a poverty-ravaged and small agriculture-based economy only 60 years ago. Aggregate output was just about US$2.8 billion and per capita GDP was a mere US$93. The success of industrialisation in Korea, along with the rise of the Korean economy as a whole, is now a well-known developmental legacy and has been analysed by many developmental scholars and policy practitioners around the world.

While various perspectives have been portrayed of Korea’s extraordinary structural change in many studies, it can be claimed, and is often claimed, that the origin of Korea’s successful industrialisation and economic transformation started with the transformation of the agricultural sector—particularly with the attainment of self-sufficiency in the staple cereal, rice.

In the early 1960s, rice self-sufficiency was a national policy of utmost exigency. Domestic production alone was far too short to meet the demand for the cereal due, in the absence of self-sufficiency, to the following reasons:

(1) Limited availability of arable lands: Arable land in Korea was only about 2 million hectares or about 27% of total land availability;

(2) Unfavourable climate conditions: The weather and climate conditions in Korea are generally unfavourable with a relatively long and harsh winter—farmlands lay fallow from November to February—along with drought, flood, and typhoons that often lead to crop failures;

(3) Rapid population growth: Population grew at a rapid pace in the post-independence and the post-war period. The annual population growth was estimated at 4% during the post-independence period (1945-1950), 1% during the war (1950-1955), and 3% during the post-war period (1955-1960);

(4) Predominance of small-holders with low productivity: Most farmers were small-holders relying on small farmlands with extremely low productivity;

(5) Lack of agricultural infrastructure: Most farmlands were rain-fed having no access to an irrigation system; furthermore, the already fragile basic infrastructure for food production, remnants from the colonial era, was largely devastated by the Korean War in the 1950s, engendering the lack of

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5 The figures are 2017 data based on the current US$ term; the data compiled from World Bank (2018) World Development Indicators.
6 As of 1961.
necessary agricultural inputs, such as fertilisers; and

(6) Lack of public finance and investment: Due to the dearth of the national resources—natural, financial or otherwise—the agricultural sector had almost no source of public finance and/or investment.

As a result of food shortage, most rural and urban poor had to endure hunger each year in the spring season—about March to May—until a new harvest of alternative grains, such as barley, was available due to the depletion of food reserves from the previous year’s harvest. It is estimated that more than 900,000 rural households had no food at all during this period of hardship. Thus, the government had to ration relief food to those who were in dire need. In addition, between 1963-1972, it initiated a number of public work projects, such as the Three River-Basin Development, and the Plantation and Anti-erosion Works, where the poor could render their labour and receive about 2.44kg of grain per person per day in return. These relief activities were financed largely by international donor agencies, mainly by the World Food Programme (WFP) and the United Nations Development Programme (UNDP).

Nevertheless, food relief was a band-aid measure. In the absence of alternative instruments, the gap between production and the demand had to be filled by imports. However, food imports significantly deteriorated the nation’s balance of payment position, nor could they be a permanent solution to the nation’s chronic food shortage. For example, Korea’s merchandise exports were a mere US$87 million in 1962 but food imports were about US$126 million—about 145% of the nation’s total merchandise exports (Figure 4).

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Figure 3. Arable Land and Population Change

![Figure 3. Arable Land and Population Change](image)

(a) Size of arable land, 1956

(b) Population and population growth rate in Korea, 1945-1965


Table 1. Distribution of Farm Holdings by Farm Size in Korea, 1959-1964

<table>
<thead>
<tr>
<th>Year</th>
<th>Total No. of Farm Households</th>
<th>&lt;0.5ha</th>
<th>0.5-1ha</th>
<th>1–&lt;2ha</th>
<th>2ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1959</td>
<td>2,267,419(100.0%)</td>
<td>968,170(42.3%)</td>
<td>688,303(30.4%)</td>
<td>474,247(20.9%)</td>
<td>146,699(6.5%)</td>
</tr>
<tr>
<td>1960</td>
<td>2,349,506(100.0%)</td>
<td>1,008,624(42.9%)</td>
<td>706,689(30.1%)</td>
<td>485,933(20.7%)</td>
<td>148,260(6.3%)</td>
</tr>
<tr>
<td>1961</td>
<td>2,327,116(100.0%)</td>
<td>946,689(40.7%)</td>
<td>740,999(31.8%)</td>
<td>490,688(21.1%)</td>
<td>148,740(6.4%)</td>
</tr>
<tr>
<td>1962</td>
<td>2,469,453(100.0%)</td>
<td>1,013,335(41.0%)</td>
<td>803,162(32.5%)</td>
<td>505,093(20.5%)</td>
<td>147,863(6.0%)</td>
</tr>
<tr>
<td>1963</td>
<td>2,415,593(100.0%)</td>
<td>1,009,238(40.7%)</td>
<td>761,015(31.5%)</td>
<td>497,398(20.6%)</td>
<td>147,942(6.1%)</td>
</tr>
<tr>
<td>1964</td>
<td>2,450,308(100.0%)</td>
<td>978,787(39.9%)</td>
<td>782,499(31.9%)</td>
<td>525,672(21.5%)</td>
<td>163,350(6.7%)</td>
</tr>
<tr>
<td>Average</td>
<td>2,379,899(100.0%)</td>
<td>985,807(41.4%)</td>
<td>747,111(31.39%)</td>
<td>496,505(20.86%)</td>
<td>150,476(6.32%)</td>
</tr>
</tbody>
</table>

Note: Original data unit used was Jeong, or Jeongbo, a traditional width unit used in Korea. As 1 jeong equals about 0.9917ha, it was treated as 1 hectare.

Source: Re-arranged by the authors; Original data from National Bureau of Statistics (1965) “Number of Farm Households by Size of Cultivation,” Korea Statistical Year Book 1965, Economic Planning Board: Seoul.

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9 Ibid.
2. The Role of the Government in the Promotion of the Green Revolution

As stated, the accomplishment of Korea’s self-sufficiency of rice, later called as Korea’s Green Revolution, was possible due to its comprehensive approach. That is, actors from all levels of the public and private sectors united to achieve this goal set by the government. It was the strategic objective of all branches of the central government—the administrative, legislative and judiciary—as well as all ministries in the administrative branches at the state level. At the local level, farmers, local governments and other private sector actors also participated with fervour. Indeed, there was a nation-wide consensus that rice self-sufficiency was a necessary but not sufficient condition for national development and structural transformation.

The GOK played a pivotal role in attaining this goal by setting overarching strategies and formulating food production policies, including the encouragement of R&D activities, the dissemination and transfer of seeds to farmers along with cultivation techniques for the new rice variety, the setting of an effective nation-wide extension system, the provision of effective channels of input distribution, financial incentives, and market access, and the like.

2.1. National policies and strategies

Although the GOK planned to raise food production to alleviate hunger and poverty in the 1950s and onward, the outcome was disappointing mainly due to:

1. scanty agricultural infrastructure and production base;
2. resource shortfall that, in turn, led to investment shortage in the sector; and
3. backwardness of agro-input industries that led to a shortage of fertilisers, pesticides and insecticides, farm machinery and equipment, etc.

It is important to note that the mass amount of US food aid delivered to Korea during the post-war period obstructed the stabilisation of the agricultural sector, despite the noble intentions and affirmative effects. It resulted in cheap food prices, which, in turn, erased the incentive and impetus for farmers to grapple with increasing harvest yields. This, in part, exacerbated a downward cycle of rural area poverty.10

Against this backdrop, rice self-sufficiency was set out as one of the nation’s strategic developmental objectives in 1962 as an integral part of the 1st 5-Year National Development Plan. The objectives of the sectoral strategies for agriculture were (1) the increase of agricultural production and (2) the modernisation of the production process. Specifically, the plan targeted an increase in food production and in agricultural products geared toward industrial inputs and exports. It also set a goal to achieve rice self-sufficiency by 1976.

It is interesting to note that a legal and institutional framework supporting the agricultural sector’s promotion was not aligned until 1967 when the Basic Law for Agriculture was promulgated.11 However, the law was more a declarative and visionary document, and lacked specific legal guidance as to how to achieve the visions proposed for the development of agriculture. In fact, the administration promoted rice self-sufficiency policies for a number of years without any legal coverage or guidance rendered by any type of umbrella laws. This illustrates how desperate

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the GOK was to achieve food self-sufficiency.

2.2. Sectoral policies and strategies

The Ministry of Agriculture and Forestry (MOAF) devised the 3rd 5-Year Plan for the Increase of Agriculture Production, 1962-1966, to attain the strategic objective of increasing food production. This plan was later revised and replaced by the 7-Year Plan for the Increase of Food Production, 1965-1971. The policy objectives centred on the expansion of arable lands and increase of cereal yield per land unit. In the 7-Year Plan, the average increase of cereal yields per annum was set at 6.2%, aiming to achieve rice self-sufficiency by 1968. The expected surplus would then be exported beginning in 1969. A target to increase cereals by 53%, from 4,561,920 metric tonnes (M/T) to 6,985,440 M/T by 1971 was also established. The plan also aimed to increase the production of rice by 29.7%, barley by 43.1%, legume by 53.3%, potatoes by 85.2%, and other cereals by 39.8%. Sectoral-level plans and policies were also devised to support the implementation of the 7-Year Plan as the following:

1. Land development and reclamation plans geared towards the expansion of arable lands;
2. Land preparation and irrigation plans for the improvement of production bases and infrastructure;
3. R&D, agriculture extension services, and dissemination/distribution policies for the augmentation of agricultural productivity; and
4. Improvement and transformation of agricultural sector structure policies.

2.3. Development of new rice varieties

Although Korea’s Green Revolution was achieved through the comprehensive effort of the various actors, the main breakthrough came in 1964 when a small group of Korean breeders were dispatched to the International Rice Research Institute (IRRI) by the GOK. The breeders developed a new semi-dwarf high-yielding cultivar at IRRI, later named as the Tong-il-type variety, derived from the Japonica x Indica hybridisation. Subsequently, the breeders introduced a series of Tong-il varieties, which successfully addressed the deficiencies of the then-prevailing Japonica varieties planted in Korea, such as low fertiliser responsiveness, lodging, vulnerability to such diseases as rice blast, etc.

Above all, the new varieties yielded about 30% more than the yields of the Japonica varieties. Yield increased to 5.13 M/T per hectare in 1972 (Tong-il) and to 6.05 M/T (Joong-won, Tong-il type) from 3.98 M/T total yield of Japonica varieties in 1962. With the distribution of the new varieties to the rural farmers, total production increased from 3.2 million M/T in 1968 to 4.09 million M/T in 1969. It rose again to 5.22 million M/T in 1976 and to 6 million M/T in 1977 at the height of the Green Revolution (Figure 5). Korea had, in about a decade, successfully severed itself from years of recurrent starvation and hunger.

![Figure 5. Rice Yields, 1965-1985](image)

Note: Data based on white rice (92.9%).
Source: Authors’ compilation of data obtained from KOSIS (2018).

2.4. Policies related to agricultural inputs: Self-sufficiency of fertilisers

As stated earlier, Korea’s population density in terms of land unit is high because unfarmable mountainous terrains limit available land for residence. Accordingly, Korea’s agriculture structure is characterised by intensive farming. The resulting challenge has always been the ability to yield maximum crop production to support the population given the limited size of arable land. To this end, fertiliser was one of the essential agricultural inputs that decisively conditioned agricultural productivity (Table 2) and thus, the expansion of a fertiliser production base was also an important agenda for Korea’s agricultural policies.

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12 The MOAF has undergone a series of re-organisation with government and regime changes in addition to the changes in its mandates; Today, it is known as the Ministry of Agriculture, Food and Rural Affairs (MOAFA).
13 National Archives of Korea (2006c).
15 Chosun Ilbo Daily (1977) “Actual Rice Yield 41.17 million seom,” in Korean, Tuesday, 06 December 1977, p.1. Seom, or Seok, is a traditional Korean unit of volume. Whole rice (with hull) is about 200kg; milled rice 144kg, and barley about 138kg.
In the 1950s, fertilisers were sourced entirely through foreign aid extended mostly by the U.S. This was due to the fact that the only fertiliser factory in Korea at that time—Heungnam Fertiliser—accounting for about 90% of the nation’s total chemical fertiliser supply, was located in the northern part of the country and now inaccessible as a result of the war. Most of the small-scale fertiliser factories located in the southern part of the country were destroyed during the Korean War (1950-1953). This led to much reliance on imported fertilisers. During this time, fertiliser imports accounted for about 40% of the total agricultural imports in terms of the total concessional loan account. This caused not only an outflow of the already short forex, but it also increased input costs for farmers.

In the 1960s, the expansion of Korea’s fertiliser production capacity continued with Gyonggi Chemical and Poongnong Fertiliser, which were built in the 1960s through concessional loans and domestic investment. Simultaneously, factories built earlier continued to improve and increase production. Fertiliser self-sufficiency was achieved in 1975 when total supply, at about 901,000 M/T, exceeded total demand, at about 886,000 M/T.

The total production capacity increased rapidly to more than 3 million M/T per annum in the late 1970s, as Namhae Chemical, a subsidiary of NH (National Agricultural Co-operative Federation), began operating as the largest fertiliser production facility in Korea. This added an annual production capacity of 330,000 M/T of urea, 700,000 of composite fertilisers, 600,000 of ammonium, 694,000 of sulfuric acid, 210,000 of phosphoric acid, and 60,000 of nitric acid.

### Table 2. Changes of Fertiliser Application and Rice Production by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Fertiliser Application (kg/ha)</th>
<th>Rice Production (MT per ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nitrogen</td>
<td>Phosphorus</td>
</tr>
<tr>
<td>1910-1931</td>
<td>-</td>
<td>33</td>
</tr>
<tr>
<td>1932-1963</td>
<td>26-40</td>
<td>21-55</td>
</tr>
<tr>
<td>1971-1977</td>
<td>100-120</td>
<td>50-60</td>
</tr>
<tr>
<td>1978-1979</td>
<td>150</td>
<td>90</td>
</tr>
<tr>
<td>2006-Present</td>
<td>90</td>
<td>45</td>
</tr>
</tbody>
</table>


Table 3. Fertiliser Manufacturers Established in the 1960s in Korea

<table>
<thead>
<tr>
<th>Year Built</th>
<th>Manufacturer</th>
<th>Product Type</th>
<th>Annual Capacity (M/T)</th>
<th>Funding Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>Chungju Fertiliser</td>
<td>Urea</td>
<td>85,000</td>
<td>USAID loan</td>
</tr>
<tr>
<td>1963</td>
<td>Honam Fertiliser</td>
<td>Urea</td>
<td>85,000</td>
<td>Domestic investment, foreign loan</td>
</tr>
<tr>
<td>1967</td>
<td>Youngnam Chemical</td>
<td>Urea, Composite</td>
<td>264,700</td>
<td>Domestic investment, USAID loan</td>
</tr>
<tr>
<td>1967</td>
<td>Jinhae Chemical</td>
<td>Urea, Composite</td>
<td>264,700</td>
<td>Gulf Oil, USAID loan</td>
</tr>
<tr>
<td>1967</td>
<td>Hankook Fertiliser</td>
<td>Urea</td>
<td>330,000</td>
<td>Commercial loans from Mitsui Corp.</td>
</tr>
<tr>
<td>1966</td>
<td>Gyonggi Chemical</td>
<td>Fused phosphate</td>
<td>50,000</td>
<td>Domestic and foreign investment</td>
</tr>
<tr>
<td>1967</td>
<td>Poongnong Fertiliser</td>
<td>Fused phosphate</td>
<td>54,000</td>
<td>Foreign investment (Japan)</td>
</tr>
<tr>
<td>1963</td>
<td>Chosun Fertiliser</td>
<td>Composite</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(exclusive use for mulberry)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1968</td>
<td>Chosun Fertiliser</td>
<td>Composite</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(exclusive use for forestry and pasture)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: USAID (the United States Agency for International Development); NH (National Agricultural Co-operative Federation). Source: Authors’ re-arrangement. MOAFRA (1999), pp. 430-431; National Archives of Korea (2016b).

For the distribution of fertilisers, the GOK appointed the National Agricultural Co-operative Federation as the national distribution agency based on the Fertiliser Supply and Demand Management Guideline (the Resolution of the Economic Council of Ministers of December 1961). It adopted a two-tier price system by creating a Special Account for Fertilisers in the NH ledger. That is, the NH purchased fertilisers from the manufacturers at the manufacturer’s bid price (selling price) and sold them to farmers at a discounted (lower-than-the-purchase) price. The GOK indemnified the deficits that accrued in addition to the handling charges, at approximately 6% and subsidised fertilisers.

The GOK was able to finance the subsidy partially from the dividends distributed from its shares in Youngnam Chemical and Jinhae Chemical. Nevertheless, the accruing deficit for the subsidy was inevitable. Although the subsidy extended under the policy completely ceased in 1987, the accrued deficits covered by the GOK for the Special Account from 1962 to 1987 was estimated at about US$2.6 billion. 22

Fertilisers were traded principally on cash basis. However, the GOK facilitated farmers’ purchase of fertilisers through credit—that is farmers were issued a promissory note stating that fertilisers would be exchanged for cereals in their possession or with expected harvest. In 1965, this credit purchase system was institutionalised through the promulgation of the Law on the Exchange of Cereals with Fertiliser of 1965. The “grain-fertiliser swap rate” was set annually by the Council of Ministers and subject to approval by the National Congress. The Council determined the swap rate based on the status of the public budget, the supply/demand situation of cereals, farmers’ income level, etc. 23

In 1961, credit purchase of fertilisers accounted for as much as 80% of the total purchase, as the interest rate specific to the swap rate was maintained at a low level. However, credit-based purchases decreased to about 30% in the 1970s, as rural area income in general improved greatly, owing largely to the two-tier pricing system for the government’s procurement of rice and improvements in productivity (Figure 6). 24 Initially in the 1960s, this cereal-fertiliser swap policy was not met with enthusiasm by the farmers in the 1960s as rice prices were low; however, it all changed in the 1970s when farm income improved as a result of the high rice price policy. 25

![Figure 6. Share of Fertiliser Purchase: Cash vs. Credit, 1961-1965](image)


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22 Park Ki-hwan (2012) The Trend and Development Measures for the Inorganic Fertiliser Industry: A Focus on the Transforming of the Supply System, in Korean, Research Report R665-3, Seoul: KREI, p.23; the US dollar amount was authors’ estimate. The exchange rate of 1978, KRW484 per US dollar, as the “mid-point” of the period, was applied.


24 Ibid., p.445.

25 Ibid.
As stated before, the GOK delegated the responsibility of fertiliser distribution to NH, which acted as a cooperative. It issued tenders, usually accepting the lowest bid on a unit price, and made provision contracts with the fertiliser manufacturers on an annual basis (Figure 7). In doing so, farmers benefitted from the low and stable fertiliser price throughout the year, in addition to the depreciation of prices resulting from large scale production. As such, transaction costs could be reduced through bulk purchases by the co-op.

However, NH garnered monopolistic capabilities as the government banned all other channels of fertiliser distribution, including imports. As a result, NH acted as the sole importer and distributor of fertilisers for 20 years (1962-1982) until the fertiliser market ultimately opened up to free competition. NH's agentship with the GOK continues today. Why then did the GOK appoint NH as an agricultural policy-intermediary? This was due to the tacit understanding between NH and the GOK as their respective sets of interests converged.

NH was a well-organised entity with a high level of penetration in the rural areas. Not only did it have members and representatives at the national level, or the co-op apex, but it also retained members in the periphery, the village-level co-operatives. Hence, by delegating policy implementation tasks to NH, the government could save a significant amount of transaction costs. Government-policies and programmes could easily be expanded into rural areas around the country via NH’s networks. The only responsibility the GOK had was just to supervise and control NH.

As for NH, it warranted a stable stream of revenue, which came through the receipt of fees from government transactions while staving off organisational threats and risks from the surrounding environment by allying with the government.

This relationship between NH and the GOK can be cogitated as an emergence of a collaborative model of public and private actors. Indeed, the GOK assumed the role of agricultural strategy and policy-setting, while NH served as an implementing agent that substantiated the strategies and policies in the field.

In fact, the GOK partnered with two private sector institutions for the substantiation of rice self-sufficiency and promotion of the agricultural sector’s transformation in Korea—NH and SMU (New Village Movement). This will be discussed in more detail in the following sections.

### 2.5. Dissemination/distribution of the Tong-il variety

As much as developing new varieties is an important task, multiplying and disseminating sufficient amounts of seeds to farmers is equally important in agriculture. Thus, multiplying certified Tong-il variety seeds was a crucial task, which was carried out by the Korea Seed and Variety Services (Table 4). The multiplication and provision of rice seeds were all led, managed and controlled by the GOK, and remains so today.

<table>
<thead>
<tr>
<th>Seed Class</th>
<th>Leading Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear seed</td>
<td>Rural Development Administration (Central Government)</td>
</tr>
<tr>
<td>Breeder seed</td>
<td>Rural Development Administration (Central Government)</td>
</tr>
<tr>
<td>Foundation seed (1st Generation)</td>
<td>Provincial Rural Development Agency (Provincial Government)</td>
</tr>
<tr>
<td>Registered seed (2nd Generation)</td>
<td>Provincial Agricultural Seed Production Station (Provincial Government)</td>
</tr>
<tr>
<td>Certified seed</td>
<td>Korea Seed and Variety Services (Central Government)</td>
</tr>
</tbody>
</table>

An average of four years was spent for the certification and dissemination of new approved varieties in Korea. However, the RDA, in collaboration with the IRRI, worked to curtail this timespan by one to two years, by multiplying Tong-il variety seeds in the Philippines to avoid Korea’s harsh winter climate. They then brought the seeds back to Korea for cultivation via chartered flights in the spring. Such extraordinary efforts greatly contributed to the early attainment of rice self-sufficiency.
2.6. Extension services: Dissemination of new techniques for the Tong-il variety

The Tong-il variety, the main vehicle of Korea’s rice self-sufficiency, was a new type of cultivar which undoubtedly required different techniques for cultivation, i.e., seeding time, water management, fertiliser application, weed control, etc., from those for the then-prevailing Japonica-type rice cultivation (Table 5). The new high-yielding rice varieties could become meaningful only when cultivated based on the techniques that they would fare well in, and meet anticipated productivity levels. Hence, farmers had to be informed of and needed to learn new techniques in order to successfully adopt and cultivate the new varieties. To this end, the RDA, among other government agencies, played a significant role in successfully localising the Tong-il variety by mobilising a well organised extension system.

Farmers, however, were highly hesitant to adopt the new variety during the initial stages of introducing the Tong-il variety. This had been anticipated as the risk of adopting a new type was very high. As revealed later, the Tong-il variety actually had several critical deficiencies: it was susceptible to low temperatures; the seedling nurseries had to be covered with vinyl sheets in order to protect it from cold temperature; it was inadaptable to the late season culture, meaning that seedling had to be planted earlier, which overlapped with the planting season for barley; scattered grains at harvest were also a problem. There was also dissatisfaction about the fact that farmers could not use the dried rice stems due to the short-statured nature of rice stems; there were various uses for dried rice stems in the rural areas, i.e. ceiling, fire-wood alternative, fodder, and the like. In addition, it required larger inputs of fertilisers, which meant higher input costs, as well as demanding necessary measures to account for the cold intolerance.

Above all, the Tong-il rice was less palatable to Korean consumers. The taste was less palatable than the prevailing Japonica due to high contents of amylose (Korean consumers preferred glutinous, sticky rice to non-sticky rice; the Tong-il rice inherited the genetic characteristics of the Indica type rice varieties, and therefore the high content of amylose made the rice non-glutinous). This led to the development of other varieties that accounted for the shortcomings of the Tong-il variety, but at a later stage.

Table 5. Difference between Japonica and Tong-il Type and the Direction for Improvement

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Japonica (1960s)</th>
<th>Tongil-type (1970s)</th>
<th>Measures for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphological traits</td>
<td>Long and panicle-number type, droopy. Less sink organs, less vascular bundles</td>
<td>Short and panicle-weight type, erect, more sink organs, more vascular bundles</td>
<td>Enhancement of grain filling and yield</td>
</tr>
<tr>
<td>Ecological traits</td>
<td>Short basic vegetative growth</td>
<td>Long basic vegetative growth, insensitive photoperiodism</td>
<td>Early seeding, protected seedling nursery</td>
</tr>
<tr>
<td>Cultural traits</td>
<td>- Fertiliser: Low uptake</td>
<td>High uptake</td>
<td>Heavy fertilisation</td>
</tr>
<tr>
<td></td>
<td>- High-density: Low adaptability</td>
<td>High adaptability</td>
<td>Dense planting</td>
</tr>
<tr>
<td></td>
<td>- Canopy: Optimum LAI 4, 30,000 spikelets per m²</td>
<td>Optimum LAI 5-6, 45,000 spikelets per m²</td>
<td>Improved grain filling and soil fertility</td>
</tr>
<tr>
<td>Physiological traits</td>
<td>- Low-temp.: Tolerant</td>
<td>Susceptible</td>
<td>High-yielding</td>
</tr>
<tr>
<td></td>
<td>- High-temp.: Low activity</td>
<td>High activity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Photosynthesis: Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Discoloration traits</td>
<td>- Seedling stage: None</td>
<td>Occur under 15°C</td>
<td>Protected seedling nursery</td>
</tr>
<tr>
<td></td>
<td>- Ripening stage: None</td>
<td>Occur under 20°C</td>
<td>Optimum water management</td>
</tr>
<tr>
<td>Resistance topests</td>
<td>Intolerant to most pests</td>
<td>- Tolerant to blast, stripe blight, small brown planthopper - Intolerant to wasting disease, nilaparvata lugens, sogatella furcifera</td>
<td>Regular control, simultaneous control</td>
</tr>
</tbody>
</table>

Note: *LAI=Leaf Area Index.
The RDA was established through the Law of the Rural Area Development of 1962 (Law No. 1039). In accordance with the law, the RDA was established as a 4-tier system—centre-, province-, city/county, and village-level (Figure 8). The main mandates of the RDA consisted of (1) R&D, (2) coaching, and (3) training. The extension system evolved mainly around technical coaches at the village-level. An extension coach at the village-level was responsible for rendering technical advice to about 7 villages, 76ha of collective farming areas—in the case of Tong-il rice paddy areas it was 59ha—and about 165ha of other paddy fields.

The RDA’s technical coaches for the rural area totalled 7,769 by 1974 from 4,790 in 1964. Larger socio-economic demands from the rural areas led to the increased number of coaches. The coaches not only served as guides and advisors of agro-techniques for rice/cereal cultivation, but they also undertook educational activities for the rural women and youth. In sum, the attainment of rice self-sufficiency was attributable not only to RDA’s breeders but also to the presence of well-organised and effectively-functioning institutions such as the RDA’s extension services (e.g. the coaching system).

2.7. Price support system/Market access

Cereal, or food, price policy in Korea has traditionally been regarded as the most important agricultural policy because cereals are politically and economically significant to the Korean economy. The price policy for rice was especially significant. In the 1950s and the 1960s, a low cereal price policy was maintained, which was conceivable given the post-war reconstruction efforts and pervasive high inflation. The low cereal price policy gained momentum through US food assistance under the Agricultural Trade Development and Assistance Act, widely known as Public Law 480, of which Korea became a beneficiary starting in 1955.

This low-price policy may have contributed to post-war socio-economic and political stability as well as helping the urban poor who were suffering from hunger. At the same time, the low price dis-incentivised farmers from producing surplus food cereals and ruined the rural economy. The terms of trade for agricultural products worsened significantly.

In the late 1960s, the GOK changed the cereal price policy considerably by setting the government purchasing price of major cereals, such as rice and barley, higher than the average rate of inflation for the general commodities. The change in the US food assistance policy requiring a mix of grant and loans for the purchase of US agricultural commodities.
surplus (1968-1971) in part also affected the change in the cereal price policy. In sum, the GOK’s conventional grain policy changed from attaining low to high prices, and in doing so, aimed to improve the terms of trade for agricultural products.

In 1970, the GOK adopted a two-tier policy for rice and barley as part of its determination and plans to boost the production of key cereals. As a result, the prices of rice and barley increased at a faster rate than those of manufactured goods. The policy aimed to raise productivity of food cereals and rural area income, support urban households, and stabilise prices in general, among other things.

As briefly stated earlier, the two-tier price system was designed in such a way that the government purchased rice and barley at a higher price than the farm gate price while selling at a lower-than-purchased price to urban consumers. This inevitably led to deficits in the government budget. The GOK reclaimed the deficits mainly through long-term borrowing from the Bank of Korea, which engendered negative impacts (such as inflation) on the Korean economy in the long-term via the increased supply of money.

Nevertheless, in the short-term, the policy resulted in the growth of cereal production as well as farm household income vis-à-vis the urban household, as well as stabilising cereal prices. In 1974, for the first time in Korean history, farm household income surpassed that of the urban household. From 1960 to 1969, the annual average of urban household income growth was about 14.6% while rural household income growth was merely 3.5%. This situation reversed between 1970 to 1979 as urban household income grew at an annual average rate of 4.5% while rural household income grew at a rate of 14.6%.

In a nutshell, the two-tier price system was a subsidy that, on the one hand, warranted market access to farmers, albeit partially, and on the other hand, stabilised cereal price for consumers. For example, in 1990, the purchasing price of an 80kg bag of Tong-il rice was about US$145.78 (KRW104,480) whilst being sold at US$77.44 (KRW55,500) leaving a difference of US$68.34 (KRW48,980). This excluded miscellaneous expenses, such as milling, warehousing and interest expenses, of US$42.11 (KRW30,180). Thus, the GOK was providing a subsidy of about US$110.45 (KRW79,160) per 80kg bag of rice.

In the period of 1970-1992, the government purchase of rice harvests, on average, accounted for about 18.5% of the total rice production and supplied approximately 23.1% of the total consumption. The policy provided a great incentive for farmers to plant and grow Tong-il type rice because the government only purchased Tong-il rice varieties. As a result, farmlands cultivating Tong-il rice rose to 548,432ha, or 44.5% of the total rice paddy fields in 1976, from 185,455ha or 15.9%. Production rose to 4.79M/T per hectare in 1976 from 3.86M/T (in contrast, the average yield of the Japonica type was about 3.29M/T per hectare). In sum, the price support system, or subsidy, was a catalyst in generating an increase of new rice varieties which in turn led to a dramatic increase in the amount of rice production.

### 3. The Role of the Private Sector Actors in the Promotion of Rice Self-Sufficiency

In the pursuit for rice self-sufficiency, the role of the private sector actors was just as crucial as that of the government. Among the private actors, NH and Saemaul Undong (SMU) were the two major partners that assisted the government in implementing policies to achieve rice self-sufficiency.

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29 The GOK stopped the long-term borrowing from the Bank of Korea in 1984.


31 The 1990 basic exchange rate of KRW716.6 was applied.


33 National Archives of Korea (2006e).

34 Refer to fn.20 in p.12 for the origin of the acronym, NH. Saemaul Undong refers to “New Village Movement” in Korean.
NH is the National Agricultural Co-operative Federation, consisting of regional level co-ops and various product co-ops, of which farmers are members (primary co-ops); these then make up an umbrella organisation at the national co-operative level known as the National Agricultural Co-operative Federation, NACF or NH (Figure 10). As such, NH is a two-tiered institution in terms of its organisational structure, which was formed only in 1980, having initially started with a three-tier system and operating as such till its consolidation in 1980. By consolidating smaller units of co-ops at the village level into larger regional co-ops, NH was able to initiate programmes and policies beneficial to its members based on their “enlarged scale” of operations. For example, NH supermarkets were created to supply daily necessities to the rural areas at prices less than or equal to those in the urban areas. Banking operations, i.e. extension of credits and loans, savings, etc., also made even, as the number of co-op members increased from several hundreds to thousands.

From a typological perspective, NH can be categorised as a multi-purpose co-op—in contrast to a single purpose co-op, which is the prevailing co-op model in Europe—that undertakes all the roles of various single-purpose co-ops under one organisation, i.e., marketing, purchasing, supplying, financing, thrift and insurance and the like. This type of co-op model can also be found in other Asian countries, such as Japan, Taiwan, Sri Lanka and Iran.35

NH started as a state-level co-operative federation in 1961 through the merger of the Agricultural Co-op and the Agricultural Bank which were established respectively in 1958. Established by the Law of Agricultural Co-operatives of 1961 (Law No. 670), it effectively funnelled government policies aiming for the attainment of rice self-sufficiency to farmers. As a proxy of the government, NH performed multiple roles encompassing that of an importer, producer, distributor of agricultural inputs, extension service provider, marketing promoter as well as financier.

On the other hand, SMU was an institution for social engineering, established for the transformation of rural communities based on the principles of “diligence, self-help and co-operation.”36 This social movement was often defined as a grass-roots community development effort, with its main objectives being (1) the modernisation of rural areas, (2) balanced development among regions, and (3) mind-set reform. That is, SMU advocated the “ownership” and “can-do” spirit throughout rural villages, mobilising and integrating dormant social energy towards a common goal of a better life for the rural communities. In addition, SMU also encouraged youth and women to get involved in mainstream activities, thus promoting social inclusion.

In sum, NH acted as an extraordinary government agricultural policy intermediary while SMU served as an institution for social engineering that aimed to transform rural areas.

3.1. NH (National Agricultural Co-operative Federation, NACF)

Agricultural production in Korea was usually undertaken by small household farms. Despite vulnerabilities originating from the limited farm sizes, they were able to exercise bargaining power forged through NH, often generating better terms of trade when purchasing goods and services as well as when selling products. As such, it would not be an exaggeration to say that NH has been the leading engine in the development of Korea’s agricultural sector by instituting general business and credit programmes that encompassed the entire agricultural value chain, stretching from the purchase of agro-inputs—fertilisers, pesticides, machines and equipment, etc.—to production, processing and marketing.

When the GOK in the 1960s set out to push forward the grain self-sufficiency policy and strategy, it delegated the sole responsibility of purchasing and distributing fertilisers as well as purchasing and warehousing rice and barley on behalf of the government to NH. In order to effectively execute the government policy and strategy on increasing rice production, NH set up an entire rice supply-chain stream covering provision of inputs, warehousing, polishing, milling, transferring and releasing of rice. NH was also

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36 Although there is no clear-cut definition of the concept of social engineering, which is today imbued with strong negative connotations, the term social engineering in this document is used to denote the changing of a society based on vision and implementing designs of a modus operandi.
responsible for implementing the double-tier price system for rice and barley and was appointed the sole supplier of other agricultural products.

The GOK also gave NH monopolistic authorities in regard to agricultural finance. The GOK raised funds to aid the improvement of irrigation systems, land preparation, natural disaster relief, and stabilisation of agro-product prices, among other needs in rural areas, and then appointed NH to manage the disbursement of funds to the rural areas for these purposes. The Credit Guaranty Fund for Agriculture, Forestry and Fisheries, created by the Law of Credit Guaranty Fund for Agriculture, Forestry and Fisheries of 1971 (Law No. 2277), was also managed by NH.

In return for the services rendered, the GOK extended tax benefits to NH in addition to handling any associated fees and charges—that is, NH’s assets and businesses were exempted from national and/or local taxes and levies, as specified in the Law of Agricultural Co-operative of 1961, though tax benefits were gradually reduced in later years. As such, a symbiotic relationship between the government and NH was forged and maintained.

On what ground did the symbiotic relationship between the GOK and NH stand? Specifically, why did the GOK allow NH to monopolise government transactions? This is perhaps due to NH’s organisational structure that enabled penetration into all rural areas and the effective transmission of government policies to virtually every individual in the rural communities. As illustrated, NH built its nation-wide organisational structure in a way that corresponded with the political/administrative divisions of the state (Figure 11). This enabled government policies and programmes to be executed effectively even at the village level, through their administrative apparatus at the regional levels. This also enabled NH, along with relevant government branches, to perform crucial tasks such as publicising and monitoring government policies and programmes.

In addition, the introduction of mutual credits brought down usurious private lending interest rates. In the 1960s, most farmers suffered from extremely high interest rates of “informal lending (a.k.a. private market loan)”, which was rampant in the rural areas due to the lack of agricultural capital as well as access to finance. To address these problems, NH adopted pilot programmes in 1967 for the mutual credit system in 150 primary co-operatives, which in 1971, expanded to all co-ops nationwide. As a result, farmers’ reliance on informal private market loans went down from 69% in 1971 to 37% in 1979.\textsuperscript{37} As such, NH infused credit into rural areas through low interest loans vis-à-vis informal loans to weed out informal lending practices. NH’s mutual credit system could mobilise “cheaper money” for farmers owing to several reasons. The apex, a merged entity of the NFAC and the Agricultural Bank, supplied credits to mutual credits operated by the primary co-ops. The credit and banking arm of the multi-purpose apex, NH, was able to acquire credits from capital markets like any other commercial bank. In addition, the GOK indemnified the spread between NH’s capital acquisition and lending. This will be discussed in more detail in the agricultural finance section of the following chapter.

Other significant contributions that NH made to the transformation and development of Korea’s rural areas were its extension services and elimination of usurious private market lending that was rampant in the rural areas at the time. A co-op is per se a voluntary and participatory co-operative institution of farmers. Hence, the provision of actionable programmes and knowledge that promoted participation and “ownership” was the centrepiece of a co-op’s extension services. To this end, NH provided agricultural knowledge, improvement of community lives and welfare, development of regional agriculture, non-farming income generation, organising of farmers, training of farmers including the next generation of farmers, and the like. NH promoted various projects to improve the quality of life and welfare of communities; projects included encouraging women to create and manage savings accounts, to write individual household account ledgers, and establish community co-op markets and stores. NH also encouraged farmers to organise themselves, which led to the rise of women’s clubs and working groups in the rural areas. Such extension services started with primary co-ops, gradually expanded to larger units, and eventually became full-scale regional development projects.

Although the plan yielded increased national income and investment, its results did not come to understand that they were the ones who had to lead, manage and work together for the successful outcome of a project, as it was, after all, meant to benefit the majority, contrary to the expectation of policy-makers, hardly made the status quo income level. Worse yet, they required more support from the government whilst dependency on government support strengthened.

Against this backdrop, the GOK launched SMU in 1970. Prior to its launch, the GOK had initiated a rural development programme called the Special Project for the Income Increase of Farmers and Fishermen, in 1968. The project aimed to raise the income level of farmers and fishermen (literally those living and working in rural areas) and was financed through government subsidy, NH loans, and matching funds by villagers. However, the outcome was grossly disappointing—only a few were able to increase their income through the support programme while the majority, contrary to the expectation of policy-makers, hardly made the status quo income level. Worse yet, they required more support from the government whilst dependency on government support strengthened.

The GOK learnt an important lesson, inter alia, from this unsuccessful project, that a fundamental change in the mindset of private sector stakeholders, viz. farmers and fishermen, ought to precede the initiation of any government support programmes. If not, any government sponsored development programmes faced likely failure as soon as government resources were exhausted. The villagers, in general, simply enjoyed the “free lunch” and did not come to understand that they were the ones who had to lead, manage and work together for the successful outcome of a project, as it was, after all, meant to benefit themselves. In short, the villagers lacked “ownership and stewardship.” Through this approach, SMU cast out defeatism and laziness while promoting the spirit of co-operation, diligence, self-help and co-operation—SMU transformed Korea’s rural areas to a development-oriented society from one imbued with development lags. Rekindling traditional values embedded in rural society—diligence, self-help and co-operation—SMU cast out defeatism and laziness while promoting the spirit of co-operation, and above all, encouraged the morale of self-help, viz., ownership and stewardship. Through this approach, SMU emphasised that oneself was the owner of one’s destiny.

When the GOK first initiated this “social movement,” it was a simple public rural development support project named “Changing to a New Village” for the improvement of living environments in rural villages. The GOK offered 335 bags of “free” cement to some 33,000 villages and gave them autonomy on the manners of utilisation of the cement. In some villages, villagers convened and worked on village- or community-level projects of exigency by mobilising labour as well as funds, however small they were. They paved village access roads, built small bridges and wells, repaired irrigation ditches, and the like. Other contrasting villages did not utilise the cement at all. Subsequently, the GOK strengthened the level of support by providing free iron bars and other construction materials to the villages that successfully utilised the cement in improving their village environment. Based on this performance-based support, the programme gradually scaled up and was later institutionalised as a national movement.

Although it evolved into a movement led by the private sector in the later stages, its onset was a government-initiated project that envisioned the transformation and development of the socio-economic status and spirit of rural areas, as the movement initially emphasised raising income levels and improving living conditions at the community level. Prior to the establishment of SMU in the 1960s, only about 60% of rural villages had vehicle access roads while only about 20% had access to electricity. Forests were also destroyed as trees were cut down for firewood. As a result, villages became vulnerable to flood and drought, leading to dismal agro-productivity.

The developmental gap between urban and rural areas also grew larger as a result of the government’s emphasis on manufacturing-led industrialisation through the 5-Year National Development Plan. Although the plan yielded high economic growth rates, the lion’s share of the growth occurred in urban areas. Undoubtedly, such imbalanced growth led to political instability in the rural areas, leading to calls for rural area development.

3.2. Saemaul Undong (SMU, New Village Movement)

SMU was an instrument for social engineering, which transformed Korea’s rural areas to a development-oriented society from one imbued with development lags. Rekindling traditional values embedded in rural society—diligence, self-help and co-operation—SMU cast out defeatism and laziness while promoting the spirit of co-operation, and above all, encouraged the morale of self-help, viz., ownership and stewardship. Through this approach, SMU emphasised that oneself was the owner of one’s destiny.

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The GOK launched SMU as a vehicle not just for income-raising activities but as a vanguard for changing mindsets, utilising lessons garnered from the Special Project for the Increase of Income for Farmers and Fishermen in order to warrant the villagers’ participation, involvement and ownership so that community development efforts would gain a driving force of self-sustainability. It especially emphasised an affirmative “can-do” and “will-do” spirit (participation and involvement) in rural areas around the country, thus creating the three fundamental values of SMU—diligence, self-help and co-operation.

Based on the aforementioned lesson, the GOK devised an institutional structure for SMU to have the following attributes:39

(1) SMU adopted a village, or a community—not a larger region or a province— as a strategic unit of programme implementation. Rural villages in Korea were already ingrained with the traditional culture and custom of co-operation and were united by regional homogeneity and kinship. Thus, the potential success of a project of common interest was higher in a village as it was also the smallest political and administrative unit compared to larger regional units, i.e. province. The larger regional unit tended to be exposed to more disparate interests so that collective actions to solve problems was less likely to be higher vis-à-vis the smaller village or community. As a matter of fact, a strategic community unit that consisted of 2 or 3 villages with common interests, such as sharing the benefits from building bridges and small-scale dams, began to appear in the 1980s;

(2) SMU was a hybrid programme in terms of development design and decision-making. Certainly, SMU was a government-initiated and government-led programme. However, it adopted a bottom-up type process as well in the developmental project design and decision-making;

(3) SMU adopted an integrated industrial development approach. SMU engaged all types of industries in the community boundary—manufacturing, agriculture, fisheries, etc.—to seek synergistic effects from the development of disparate industries;

(4) SMU also adopted a performance-based incentive approach. As stated earlier, support from the GOK was not equally extended to all villages around the country but only to those that yielded results. The GOK classified villages into three categories: the basic village, the self-help village, and the self-sustainable village. The GOK first extended support to the self-sustainable villages and prepared development plans by which the basic and the self-help villages would be able to reach the developmental level of the self-sustainable villages;

(5) SMU focused on bringing up leaders. In most villages, villagers selected two leaders, a male and a female, who served as liaisons between the government and the villagers. They also acted as facilitators and mediators when conflicts of disparate interests emerged among villagers. SMU contributed to gender equality by selecting female village leaders. Due perhaps to the Confucian culture and traditions, women were absent in the decision-making sphere not only at home but also at the societal level with a limited role in the economic and political spheres. Access to education for women was also limited. Amid such circumstances, SMU’s contribution to initiating gender mainstreaming was highly significant in shaping women’s roles in the developmental process;

(6) An inter-ministerial support structure was formed to help promote SMU. The GOK organised a support structure for the promotion of SMU from the central government- to the local government-level. The Ministry of Interior in the central government established the Central Council of SMU in 1972 to oversee and co-ordinate SMU related policies and programmes within the government. Based on the Law of the Promotion of SMU of 1980, the SMU Central Headquarter, as a non-profit organisation, was also established. Subsequently, SMU Central Headquarter established branches (councils) at the provincial, district and community level—just like the organisational structure of the NH. Thus, government policies easily moved through SMU’s hierarchical structure and the co-operation between SMU and the government became robust.

SMU, along with NH, soon became a vanguard of rice self-sufficiency policy implementation. Indeed, SMU was highly motivated and institutionally well prepared to respond to the GOK’s “let-us-live-better” initiative. After all, SMU would also reap benefits from its implementation of government policies focused on poverty reduction via increased rice production. All SMU leaders, though volunteers, actively participated and were involved in the dissemination of the new rice variety and new cultivation techniques that appended to the cultivation of the variety. Thus, the government’s efforts of transforming the mind-
set of rural villagers eventually seemed to have succeeded. During the period 1970-1982, approximately US$13.3 billion were spent on the promotion and implementation of SMU projects. Of the total, the GOK assumed about 51%, or about US$6.8 billion, while villagers invested, 49%, or about US$6.5 billion, as matching funds to the government contribution. This demonstrates the magnitude of the villagers’ participation and involvement in and acceptance of SMU as their own developmental programme.

3.3. Private sector firms

Although private sector firms are, inherently, profit pursuers, they worked together with the government for the attainment of rice self-sufficiency. In return, the government compensated the firms with various benefits—it even issued a government guaranty for the firms’ commercial loans. Hankook Fertiliser Incorporated was a case in point. Samsung invested about US$10 million in addition to a commercial loan of about US$42 million borrowed from the Mitsui Corporation of Japan and built Hankook Fertiliser in 1964. As stated earlier, Hankook Fertiliser produced urea—an indispensable input for agricultural products including rice. The GOK issued a government guaranty for Mitsui’s loan. As such, the inter-dependency between the government and strategic industries was forged in the 1960s. Indeed, fertiliser manufacturers were of strategic importance in the promotion of rice self-sufficiency policies as they provided an important input for the increase of rice productivity.

Daedong Industrial is another example of collaboration between the government and private sector firms. Starting as an iron foundry that crafted agro-equipment, such as shovels, sickles, hoes, and the like, Daedong Industrial began to manufacture irrigation and threshing motor in 1949. As Korea’s rain-fed paddy fields and uplands accounted for about 57% of arable farmland, the irrigation motor helped pump up underground water, securing the water source for the cultivation of agro-products including rice. When Daedong Industrial began to manufacture power tillers (rotary tillers) in 1962 based on technological co-operation with Mitsubishi, the government extended its support by imposing a ban on the import of foreign-made power tillers. Then in 1968, Daedong began to manufacture original equipment manufacturing (OEM) basis tractors in co-operation with the US’s Ford Motor Company. Perhaps Daedong’s manufacturing of the multi-purpose power tiller and tractor was the point of inception for Korea’s agro-mechanisation.

Aside from the aforementioned cases, numerous small and medium-sized companies (SMEs) also entered the agriculture market, i.e., pesticides, seedlings, nursery, etc., to seize opportunities created by the rice self-sufficiency policies. This corroborates an argument that the GOK not only pushed forward with export-promotion industrialisation (EPI), as is widely known in academia, but that it also complemented EPI with import-substitute industrialisation policies (ISI).

4. Main Lessons and Implications Drawn from Korea’s Experiences in Rice Self-Sufficiency

Although Korea’s Green Revolution took place some 40-50 years ago, it still renders invaluable lessons for developing countries around the world that aspire to attain food self-sufficiency and to transform and develop the agricultural sector.

Having been a victim of atrocious historical developments, Korea’s agricultural sector, not to mention the state itself, suffered from the lack of development for decades. Then in the 1960s to the 1970s, Korea finally opened the door to growth and took steps to ameliorate chronic poverty and hunger. Korea’s nation-wide efforts to achieve food self-sufficiency eventually yielded extraordinary results. Rice production increased to about 6 million M/T in 1977, or increased about 105.7%, from 2.9 million M/T in 1964. Above all, the annual rural household income improved to about US$2,141 in 1977, or increased 326.2%, from US$502 in 1964 (Figure 12).

Nevertheless, the production of barley diminished significantly because the GOK focused mainly on increasing production of rice, the staple crop. The largest possible share of arable land was set aside for rice production. In addition, the Tong-il type varieties were mostly late maturing cultivars; thus, the season for the harvest of rice, a summer crop, and the planting of barley, a winter crop, overlapped. Consequently, the double cropping of rice and barley was not possible.
In retrospect, the achievement of rice self-sufficiency not only helped maintain socio-political stability, but also created an opportunity for the development of non-agricultural industries. Although it was not clear whether the growth of the agricultural sector spilled over to the growth of the non-agricultural sector, or vice versa, it was obvious that the synergy of growth between the two sectors was mutually reinforcing. Hence, it is safe to say that the attainment of rice self-sufficiency has helped, at least in Korea, gain momentum in its national growth.

4.1. Contributing factors to the attainment of rice self-sufficiency

As discussed thus far, Korea’s attainment of rice self-sufficiency was the culmination of numerous factors. It was also the outcome of co-operation between stakeholders, who directly and indirectly, contributed to the achievement of the national goal (Table 7).

The factors that contributed to the accomplishment of rice self-sufficiency, inter alia, can be characterised as follows:

1. It was the comprehensive effort of all the actors in the public and the private sector who had a clear understanding of and an agreement to the national goal of food self-sufficiency (See also Table 7);

2. The government exercised outstanding governance capacity. It devised clear and meticulous strategies, sound policies, and action plans as well as concomitant roadmaps for the achievement of the national goal; the administrative, legislative and judiciary branches of the government sustained the implementation of the strategies and policies by providing legal and regulatory statutes;

3. In addition, the government built physical and non-physical infrastructure—land preparation, irrigation system, extension services, agricultural price support programmes, access to finance, etc.;

4. The government opened the government procurement market so as to achieve price stabilisation of grains as well as to provide markets for the trade of goods;

5. International development assistance programmes contributed through resources and technologies that jump-started the agricultural transformation efforts; nevertheless, it is equally important to note that the GOK utilised the foreign aid in an efficient and effective way that maximised the impact of aid programmes—the building of the 1st and the 2nd fertiliser factory are stellar examples;

6. R&D was one of the most crucial factors in the attainment of rice self-sufficiency; it is noteworthy to mention that the introduction of a new high-yielding rice variety was greatly indebted to an international development assistance programme;

7. The government established, and helped establish, public and private institutions that served as effective vehicles to implementing strategies and policies, such as NH and SMU;

8. The government supported the manufacturing sector for agricultural mechanisation by imposing trade policies, i.e. a ban on the import of power tillers, and the opening of a government procurement market. Among the stakeholders involved in the quest for rice self-sufficiency, the role of the GOK was impeccable as the designer of meticulous and scrupulous national strategies, policies, action plans, roadmaps for rice self-sufficiency from the outset. The most significant achievement that the government attained in the process of rice self-sufficiency was that it provided momentum for building private sector capacity by institutionalising and supporting such institutions as NH and SMU as well as private sector firms.

4.2. Challenges yet ahead

As stated thus far, Korea’s quest for rice self-sufficiency was achieved in 1977 by increasing productivity at an
extraordinary rate. As rice production exceeded some 6 million M/T, the import of foreign rice eventually ceased. However, the record was soon tarnished by pests such as rice blasts. The Tong-il variety was much more vulnerable to rice blast diseases than other prevailing rice varieties. Furthermore, with the capricious climate change and colder summer weather that occurred especially in 1980, total rice production faced a downturn. To add fodder to the fire, the GOK’s agricultural policies that focused mainly on the increase of rice production faced harsh criticism. As a result, the main arm of rice self-sufficiency, the two-tier price system, had to be scrapped, as it increased and exacerbated government budget deficits and imposed inflationary pressures.43

However, the most painful blow to the rice policies came from the consumers. The Tong-il rice, as discussed earlier, was less palatable to Korean consumers because of the high content of amylose as well as the shape; consumers preferred the taste and linear-oblong shape of the Japonica type rice. Consequently, Japonica was sold at a higher price than the Tong-il type, leading to a decline in the planting of the Tong-il variety. The GOK reviewed its grain policies centred on distributing the Tong-il variety and promptly began to address its shortcomings. As a result, new Tong-il type varieties that addressed its predecessor’s deficiencies were introduced and rice self-sufficiency was back on track in the 1980s and onward.

Table 7. Major Stakeholders and Their Activities in the Promotion of the Rice Self-Sufficiency

<table>
<thead>
<tr>
<th>Actor</th>
<th>Leading Agency</th>
<th>Modality</th>
<th>Major Activities</th>
<th>Funding Source</th>
<th>Inception Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>GOK</td>
<td>RDA (MOAF*)</td>
<td>International development assistance</td>
<td>USAID, IRRI</td>
<td>1964</td>
</tr>
<tr>
<td></td>
<td>MOCI*, MOF*</td>
<td>International development assistance</td>
<td>Provide essential agricultural inputs (i.e. fertilisers, seeds)</td>
<td>USAID, National budget</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RDA (MOAF)</td>
<td>Extension services</td>
<td>Provide and cultivation techniques</td>
<td>National budget</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOF, MOAF, BOK</td>
<td>Two-tier rice price system (Farm price support system)</td>
<td>Market access and income increase</td>
<td>National budget</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOF, MOAF, BOK</td>
<td>Two-tier fertiliser price system</td>
<td>Warrant indispensable agro-inputs</td>
<td>National budget</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOAF</td>
<td>Land preparation, irrigation system</td>
<td>Develop and improve agricultural infrastructure</td>
<td>Foreign aid, National budget</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOJ, MOAF</td>
<td>Laws and regulations for farm lands, land preparation</td>
<td>Promulgate a series of laws and regulations to support the development of the agricultural sector</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>NH</td>
<td>NH Nonghyup (Co-operative)</td>
<td>Financial services and co-operative services</td>
<td>Fees from the agency businesses for the GOK</td>
<td>1968</td>
</tr>
<tr>
<td></td>
<td>Firms</td>
<td>International commercial loans, technology transfer (Original equipment manufacturing)</td>
<td>Fertiliser producing, the manufacturing of agricultural machinery</td>
<td>Commercial loans, OEM</td>
<td>1962</td>
</tr>
<tr>
<td></td>
<td>Farmers</td>
<td>Saemaul Undong (New Village Movement)</td>
<td>Social engineering geared to rural community development (enhancing ownership, etc.)</td>
<td>The government contribution and matching fund</td>
<td>1970</td>
</tr>
</tbody>
</table>

Notes: RDA (Rural Development Administration); MOCI (Ministry of Commerce and Industry); MOA (Ministry of Agriculture and Forestry); MOF (Ministry of Finance); BOK (Bank of Korea); MOJ (Ministry of Justice); * Old names.
Source: Authors’ compilation.

43 See also fn.29 in p.19.
1. Background of the Post-Green Revolution Era

The post-rice self-sufficiency era—specifically the period from 1978 to 1994—can be characterised by fundamental changes in government policies that tried to address changes that occurred in the internal and external environments of the agricultural sector while accelerating the transformation process of the sector.

Rice production in the 1980s and the 1990s continuously accelerated beyond the level of self-sufficiency. The government’s inventory of rice in 1989 was estimated to exceed 1.4 million M/T. This compelled the government to re-consider planting Tong-il type varieties as they were no longer very welcomed in the markets. The price of the “Tong-il rice” declined to about half of that of the traditional rice (the Japonica type). Simply put, this meant that farmers had to yield about twice the amount of Tong-il rice to even out the market price of the traditional type rice. The sole reason that consumers turned away from the Tong-il type rice was its inferior “quality” vis-à-vis the traditional type rice.

Then, what specifically was the “quality” problem? The quality preference of consumers, in general, was not a matter of nutrients in the rice but rather of aroma, softness after cooking, texture, shape, colour, clarity, etc. Above all, Korean consumers placed emphasis on taste, as elucidated in the preceding chapter—the sticky texture vis-à-vis the non-sticky texture of the Indica type (long grain type) rice.

Perhaps, the dietary habits of people can be acquired rather than ascribed. Nevertheless, an unwavering fact for Korean consumers at that time was that they still gravitated towards what was familiar. This was the taste of the “traditional” type rice which equated with their standard of quality. As the level of per capita income increased, the consumer’s choice was inarguably the traditional rice over the Tong-il rice, even though it was two times more expensive. To many, price was no longer a determinant factor in the decision to purchase rice. Taking into consideration the reality of the market, the government had no choice but to alter its posture of quantity over quality.

In the rice self-sufficiency era, the government focused largely on the production node of the value chain without much consideration of consumer demand (Figure 13). Thus, all the activities in the value chain were managed through a top-down approach and most of the available national resources were mobilised for rice production. An indicator of change in consumer demand was seemingly not taken seriously as of yet in government policy formulation.

However, in the wake of undergoing changes on the demand-side, concomitant changes in the course of agricultural development strategies and government policies were inevitable. Perhaps it was also a signal that the centre of gravity of the agro-market control was now shifting to the market.

Cataclysmic changes in the agro-business environment also began to take shape. A significant change in the demographics of the rural area was taking place. The advent of the Uruguay Round was a new type of threat that the agricultural sector in Korea had never faced before. That is, the sector would now be facing severe foreign competition in the local market as the opening of the Korean agricultural market to foreign agro-products was an imminent reality.

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44 The flow of the Tong-I type rice was highly unilateral and the linkages between the activities of each node were very simple. In contrast, the linkages of the traditional rice chain were “thick” because of the exchange of market information, i.e. diverse demands, actively flew through (see Figure 13).
It followed that the strategies and policies of the rice self-sufficiency era were no longer viable and that paradigmatic changes were needed to sustain the agricultural sector transformation and further development. To this end, the behaviours of the stakeholders of the agricultural sector, both the government and private sector actors, had to change as well. As such, this chapter sets its foci on the changes of the stakeholders’ activities from the perspective of the agro-value chain—production, storage and process, and distribution.

2. Revamping the Agricultural Value Chain

2.1. Modernising the agricultural value chain in Korea

Given that agro-business—production, distribution and sale of agro-products including rice—in Korea, in general, was dominated by small-scale operators, business transactions were also small and insignificant. After the attainment of rice self-sufficiency, however, market activities began to grow and became more active and buoyant. As the economy started to grow and the amount of agricultural production continued to increase, activities in the entire agriculture value chain also became more active. The increasing pace of urbanisation also created an increased demand for foods, which in turn, contributed to the enhancement of the value chain.

Nevertheless, the agricultural sector’s physical and institutional infrastructure was not sufficient enough to support and encourage these changes. Thus, the government’s focus shifted to the development of infrastructure for the agricultural sector.

2.2. Production activities

Tracing back the experiences of the path towards rice self-sufficiency, it can be said that the buoyant and bustling agricultural markets in Korea became possible through the increase of agro-production, which created an agricultural surplus. The surplus, in turn, served as a primer to activate dynamic market functions in the areas of transportation, wholesale and retail distribution, agro-processing, and the like. In addition, the agro-product surplus eventually led to the rise of export activities. From the government’s perspective, the price stabilisation of rice, as the main staple, continued to be a focal point of food policies amid promotion of manufacturing exports. Hence, the sustained production of rice was an important pre-requisite not only for the development of the agricultural sector but also for the growth of the national economy as a whole.

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45 An agricultural value chain (AVC) determines the “set of actors and activities that bring a basic agricultural product from production in the field to final consumption, where at each stage value is added to the product. A value chain can be a vertical linking or a network between various independent business organisations and can involve processing, packaging, storage, transport and distribution.” Source: Food and Agriculture Organisation the United Nations, FAO, et. al (2010) “Agricultural value chain development: Threat or opportunity for women’s employment?” Gender and Rural Employment Policy Brief #4, http://www.fao.org/docrep/013/i2008e/i2008e04.pdf (Access date: 03 July 2018).
2.2.1. Continued improvement of the rice varieties

As discussed previously, the first hybrid Tong-il variety possessed a number of shortcomings, which were detected even during its breeding process. However, the GOK still pushed forward with the multiplication and dissemination of the Tong-il variety seedling (IR667 a.k.a. Suwon 213) as it opted for quantity over quality. Thus, the RDA’s thremmatologists were handed the critical task of improving the quality of the Tong-il type rice variety so that it could compete in the market.

After thousands of crosses, if not more, they eventually introduced about 11 new Tong-il type varieties in 1975 and 1976 that addressed the shortcomings of the Tong-il variety. Taste was improved by decreasing the amylose contents to less than 20%. The breeders also reduced the size of the rice kernel so that rice clarity—the level of translucency—greatly improved. The physiological properties were also accounted for, such as cold susceptibility, late maturing, easy grain shattering and the like, and all of these deficiencies and stresses of the Tong-il variety were improved.

That the sustenance of rice self-sufficiency was attributable mainly to the breeders at RDA may not be an exaggerated claim at all. They continuously improved rice varieties that adapted well to the changing environmental conditions. As a result, about 288 new rice varieties have been introduced since 1945. Of the new varieties, some 244 have been brought forth by the breeders since 1980.\(^46\) The breeders even introduced functional rice varieties. Eventually, they improved the Japonica type varieties—pest tolerant and high-yielding varieties—and this expedited the disappearance of the Tong-il varieties from the paddy fields in the 1990s. A discontinuation of government procurement of Tong-il rice put an end to the era of rice self-sufficiency.

2.2.2. Fertilisers

As discussed in the preceding chapter, the price and distribution of fertilisers, strategic inputs for rice cultivation, were controlled by the government. The government set the purchasing and sales price of fertilisers while NH was appointed by the government as the sole agent for the purchase and delivery of fertilisers.

However, there was a great turn of government control in 1982. As of the 1st August 1982, a distribution ban on certain types of fertilisers was lifted, i.e., ammonium sulphate, the fertilisers for flowers, fruits and other special and specific crops, etc. The production, pricing, and distribution were left to market functions. The liberalisation of the fertiliser distribution system continued and in 1987, distribution was entirely devolved to the market. These changes were made as a part of the heavy industry rationalisation measures and were prompted, among other reasons, mainly by (1) excessive fertiliser production, and (2) accumulating deficits in the Special Account for Fertilisers.

As stated previously, self-sufficiency of fertilisers was achieved in 1975 (Figure 14). Since then, production has exceeded demand. The excess amount imposed financial burdens not only on the manufacturers, but also on the government.

\[\text{Figure 14. Production and Consumption of Fertilisers, 1965-1988}\]


The deficits in the government’s special account became a vexing problem. The government’s borrowing from the Bank of Korea turned into inflationary pressures; the borrowing from NH caused a disruption of short-term loans to primary co-ops. In addition, the Oil Crisis of 1973 caused a drastic increase in the price of raw materials for fertiliser production. When the 2nd Oil Crisis of 1978 followed, the government could no longer defer the reform and adjustment of the fertiliser industry. It closed a few fertiliser plants to re-align production capacity and as a result of the industry reform and capacity adjustment, urea production capacity decreased from 1.46 million M/T to 825,000 M/T. Production of composite was also slashed from 1.24 million M/T to 825,000 M/T.\(^47\)

The manufacturers actively tried to rationalise the problem of excess production capacity in an attempt to extend the industry life cycle by developing overseas export markets. Hankook Fertiliser exported 20,000 M/T of urea to Pa-


kistan in 1967. After this very first export, Jinhae Chemical began exporting composites in 1972. Since then, manufacturers have exported their products to some 52 countries. Exports peaked at US$311 million in 1980 but decreased to US$170 million in 1985 and to US$162 million in 1987 whilst global fertiliser consumption has also witnessed a downward trend.

![Figure 15. Changes in the Fertiliser Exports, 1980-1997](image)

Source: Authors’ compilation from the data obtained from KREI (1990) and MOAFRA (1999). Original data were from the Korea Fertiliser Association.

Fertiliser manufacturers began reducing their dependency on fertilisers by diversifying their product lines. For example, Jinhae Chemical scaled down their production/sales of fertilisers from 90% to about 73%.  

On the distribution side, the fertiliser distribution structure did not change much, albeit liberalisation took place, especially in terms of NH’s market domination. Even though the market share of some specific fertilisers was absorbed by private sector actors, chemical fertilisers were still monopolised by NH (Table 8).

![Table 8. Market Share of NH and Private Suppliers](image)

<table>
<thead>
<tr>
<th>Year</th>
<th>NH (M/T)</th>
<th>Private Suppliers (M/T)</th>
<th>Total (M/T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>1,780</td>
<td>80</td>
<td>1,860</td>
</tr>
<tr>
<td>1989</td>
<td>1,765</td>
<td>289</td>
<td>2,054</td>
</tr>
<tr>
<td>1991</td>
<td>1,443</td>
<td>327</td>
<td>1,770</td>
</tr>
<tr>
<td>1993</td>
<td>1,705</td>
<td>182</td>
<td>1,887</td>
</tr>
<tr>
<td>1995</td>
<td>1,663</td>
<td>429</td>
<td>2,091</td>
</tr>
<tr>
<td>1997</td>
<td>1,855</td>
<td>277</td>
<td>2,132</td>
</tr>
</tbody>
</table>

Notes: Unit in ’000 M/T; The figures in parentheses represent the percentage.


Although the post-rice self-sufficiency era signalled the onset of the decline of the fertiliser industry, the industry not only survived, but also expanded by undertaking diversification measures and has remained as a strategic industry for one of the most important agricultural inputs.

2.2.3. Land re-arrangement and consolidation

In the 1960s, paddy fields in Korea were fragmented and not well organised. The lot sizes were generally small and shapes were irregular. Accordingly, land titles were also fragmented and dispersed to different owners. This was attributable to the fact that most farmers were small-holders, as discussed in the preceding chapter. Furthermore, some paddy fields were terraced fields owing to Korea’s mountainous terrains. Hence, levees and drainages were tortuous, making them inefficient and ineffective to manage arable land including farmlands. Normally, levees served as access to the paddy fields but were so narrow that even a hand-cart would have had difficulty passing.

Noticing the need for agricultural land re-arrangement and consolidation (ALRC), a certain provincial government in 1964 started an ALRC plan to combine dispersed and fragmented properties. But at the time, most farmers as well as policy-makers in the central government were not aware of the benefits of ALRC. So, the plan was confined to rural area developmental efforts at the local level.

![Figure 16. Before and After an ALRC Project](image)


Realising the benefits of the plan and as a result of the central government’s determination to modernise rural areas, ALRC was actively promoted by the government at the national level in the 1970s. The legal foundation for ALRC was laid on the Law of Land Improvement in 1960 and then replaced by the Law of the Promotion of Rural Area Modernisation. It was again revised by the Law of the Rural Area Re-arrangement of 1995. According to the laws, only the central and local governments, the Land Corporation, a public entity, land improvement co-ops and agricultural land owners were qualified for ALRC projects.

In 1971, a budget distribution standard was set for ALRC. The central government contributed 50% of the total budget for any ALRC projects, the provincial and county governments 30%, whilst farmers contributed 20%. Then in the 1980s, it was adjusted to 70%, 20% and 10% respectively for the central government, the provincial and county governments, and farmers. Subsequently the (central and local) governments assumed the entire budgetary amount starting from 1993.49

In 1972, the government set a goal of applying ALRC on 588,000ha (about 45%) of the total size of paddy fields, and then adjusted the objective to 706,000ha in the late 1970s. By 1998, about 80%, or about 723,000ha was completed when the target area was yet again re-adjusted to 902,000ha (about 78% of the total paddy fields, or about 1.16 million ha).50

In general, an ALRC project included three main stages of implementation—the planning stage for the re-arrangement and consolidation, the improvement of roads and irrigation system and, finally, the land swap stage, and the subsequent title registration, after the completion of the project. Of the three stages, the land swap stage was perhaps the most difficult phase as conflicts of interest and disputes among land-owners, viz., farmers, sometimes occurred, even though they had formally agreed to the commencement of an ALRC during the planning stage. The basic principle was to conduct a land swap to recognise the owners’ original land location as much as possible. However, reconciliation processes for any inevitable differences were undertaken by a general assembly of the beneficiaries, the farmers, as well as a board of representatives selected by the farmers. The general assembly and the board devised the land swap plans to which all the land-owners were to formally agree. The plan included survey results and subsequent evaluation of the re-arranged and consolidated lands.

Although ALRC ended in 2004, the project not only yielded an increase in productivity, farming efficiency, and economic benefits, it also paved the way for agro-mechanisation. In fact, ALRC followed highly specific and meticulous design standards. For example, it was specified that aqueduct and drainage should be built with concrete to minimise the loss of water. The design standards even specified the thickness of the concrete for the aqueduct. The standards also specified the width of the main access roads (5m-6m, with 3.3m-5m sub-access roads) to the fields that were to be built alongside the aqueducts/drainage systems.51 As a result, tractors and other agro-machines now had direct access to the paddy fields. In other words, Korea’s agro-mechanisation would not have been possible without the ALRC plans.

### 2.2.4. Agro-mechanisation

In the 1970s, the rural areas experienced a colossal change in their demographics. Migration from the rural areas to the urban cities began at a significant rate. Migration was estimated to be about 200,000 per annum in the 1960s and doubled in the late 1960s. Population outflow from the rural areas was drastic. As shown in Figure 17(b), the total population in the rural areas decreased to 9.7 million in 1982 and to 5.7 million in 1992 from 14.7 million in 1972.

The most grievous aspect of this change was the outflow of a young labour-force. The population under age 40 greatly decreased while the population above age 50 increased. Also, the female population increased whilst the male population decreased. This change in age and gender led to a shortage of available labour, which in turn, resulted in the rapid increase of labour wages in the rural areas.52 The daily labour wage for an adult male was US$0.82 in 1961 but increased to US$1.67 in 1970.53

As such, the change in the population structure was one of the main reasons why the GOK expedited the promotion of agro-mechanisation. In order to raise agricultural

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50 Ibid.
53 Based on the exchange rates of KRW103 per dollar and KRW316.65 in February 1961 and December 1970. The wage increase was about 5 times in the 9-year period in the Korean local currency term. Source: The exchange rates obtained from Bureau of National Statistics (1970) and Statistics Korea (2018).
productivity, agro-mechanisation was an inevitable policy choice.

The agricultural sector in Korea prior to the 1960s depended on human and animal-powered ploughing, tilling, harvesting, and threshing. As stated earlier, the power tiller was manufactured and introduced in Korea in 1962. The power tiller was a very useful piece of machinery in farming, as it was used not only for tillage, but also for irrigation, agro-product transportation, pest control, threshing and the like (Figure 18).

Considering the soil quality and nature of the terrain, the 5-Year Plan for Agro-Mechanisation (1972-1976) initiated by the government envisaged the supply and distribution of about 100,000 units of small-sized machinery, such as the power tiller, by 1976. The budget for the plan was at about US$75 million, appropriated from the National Investment Fund. In 1978, the government subsequently promulgated the Law of the Promotion of Agro-Mechanisation, to provide legal support for the promotion of agro-mechanisation.

Based on the budget, the government provided low interest, long-term loans for those farmers wishing to acquire machinery. For example, for the purchase of a machinery in high demand, such as a power tiller, water pump, speed sprayer, etc., about 70% of the machine price could be borrowed through an equal monthly payment amortised over a 5-year period. For machinery such as a thresher, planter, power-weeder, etc., the loans were payable in two years of equal payments.54

Encouraged by the successful completion of the plan, the government commenced the 2nd 5-Year Plan for Agro-Mechanisation (1977-1981), which at this time focused mainly on the supply of large agro-machinery, such as a tractors, combines, and the like. The budget for the implementation of the 2nd plan was appropriated by international development loans from the Asia Development Bank (ADB), the Overseas Economic Co-operation Fund (OECF, Japan) and budgetary support from the GOK.55

The distribution and after-sales service of agro-machinery


55 Ibid., p.369.
was based on a dual system—that is, NH possessed the rights to distribute those models that were subsidised by the government. Private sector manufacturers were only allowed to distribute non-subsidised models directly to consumers via their distribution networks. At this time, NH also initiated the supply of tax-exempted fuel for agricultural machinery, adding yet another product line—gasoline and kerosene—to its business, thus enabling it to compete in the gas retail market with other private sector businesses.

The 5-year plans continued into the 1980s and 1990s as the GOK prepared and implemented the 3rd 5-Year Plan for Agro-Mechanisation (1982-1986) and the 4th 5-Year Plan for Agro-Mechanisation (1987-1991) respectively. The 3rd 5-Year Plan aimed at 100% completion of mechanisation for wet-land paddies in flat areas and 50% for upland terraced paddies. It also targeted the expansion of mechanisation to the horticulture and livestock industries. Tax-exemption for fuel continued and expanded, as fuel for agro-machinery was exempted from both special consumption tax and value added tax.

The 4th plan was characterised by the promotion of the sales and distribution of second-hand agricultural machinery. During this period, government control of the price and distribution of agro-machinery was liberalised. In fact, the GOK had controlled the price of machinery in order to protect the agro-machinery manufacturing industry. However, facing the imminent opening of the agro-product markets to international competition, the government inevitably liberalised the price and distribution channel and relinquished them to full market functions and open competition.

Nevertheless, the GOK was fully devoted to agro-mechanisation in the 1970s. In 1979, the GOK established the Agriculture Mechanisation Research Institute (AMRI) as an affiliate entity of the RDA. The primary mandate of the AMRI included mechanical engineering research on and quality evaluation of agro-machineries. This added a R&D and quality control function to the government apparatus of the agro-mechanisation support system.

Buoyant entrepreneurial activities were observed in the private sector as well. Large agro-machinery manufacturing firms were incorporated and rapidly grew in the 1980s. There were about 100 agro-machinery manufacturers and about 400 parts manufacturing firms that were in operation by the end of 1980s.

Through the intervention and associated efforts of public and private sector actors, all the production processes of rice farming, starting from planting seedlings to harvesting, were mechanised with such machineries as a power tiller, tractor, rice-planter, thresher, water-pump, drier, binder, combine, and the like. As far as rice farming was concerned, the agro-mechanisation rate reached about 90% in the early 1990s. The labour hour input for rice cultivation reduced to 37.4 hours per 0.1ha in 1995 from 141 hours in 1965, saving about 25% in labour hour input. In spite of the drastic population decrease, agricultural productivity not only sustained but increased. The reason can be attributed to the successful agro-mechanisation.

2.3. Storage and processing activities

2.3.1. Rice Processing Centre (RPC)

The quality of rice is decisively predisposed by storage and milling processes. In order to enhance the quality of rice, to save the processing cost, to prevent loss and to improve the rice distribution structure, rice processing centres (RPCs) were established in 1991 by the government as part of an action plan for Farming and Fishing Villages Structural Improvement Projects (Figure 19). An RPC is a systemic complex where all post-harvest activities, such as weighing, drying, storage, processing (milling) and packaging, are undertaken. Since its establishment in 1991, 328 RPCs have been in operation, or at least one RPC per city/county. Although most RPCs were initially set up by NH, private RPCs were also encouraged. The central government supported about 50% of the total construction cost and the local government supported about 10%. In 1995, a drying and storage complex (DSC) was also built. By 2004, about 568 DSCs were in operation. In the same year, the government ceased to support the construction of new RPCs but continued to support DSCs.

56 The AMRI was re-named to the Agriculture Engineering Research Institute (AERI) in 2004 and was merged with other government-funded agriculture institutes to the National Institute of Agricultural Sciences (NIAS), as an affiliate of the RDA, in 2008.
58 Ibid.
59 National Archives of Korea (2006h) “From Sickle and Hoe to Tractor and Combine: Agro-Mechanisation,” Meet Korea in Archives, in Korean, http://theme.archives.go.kr/next/koreaOfRecord/agriculture.do (Access date: 04 July 2018). The “a” as in 10a refers to “are (100 m²).”
61 By the end of 2004, there were about 200 NH RPCs and 128 private RPCs in operation.
62 The government support rendered to the construction of RPCs ceased as of 2002.

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Many traditional mills were already operating in rural areas. Most traditional mills, however, were small-scale and obsolete. Facing the imminent opening of the agricultural market to international competition, the government pushed forward with the construction of modern RPCs to improve the competitiveness of local rice.

Most RPCs were built based on the standard design of iron silos in consideration of the cost factor—it was indeed the cheapest in construction costs. The durability of an RPC was generally 10 years for machineries, 20 years for silos and 30 years for buildings. They were also built in 9 different styles, categorically, to suit 1,200 M/T of grains, 2,500 M/T, 5,000 M/T, and up to 20,000 M/T with an increment of 2,500 M/T.

As for construction costs, six areas accounted primarily for the total construction cost of an RPC: (1) land acquisition, (2) construction of building/s, (3) the in-loading, storage, and drying facilities, (4) the milling, packaging, and dust collecting installations, (5) electrical systems, and (6) others.

The building, in general, consisted of facilities for drying, milling, and packaging as well as storage facilities and offices. For the 1,200 M/T-type RPC, a land of about 60.5m$^2$ in size was acquired. For the 2,500 M/T-type, it was about 90.8m$^2$; and for those types of RPCs larger than 2,500 M/T in processing capacity, land size increased at about 15m$^2$ per 2,500 M/T. The increment was only about 15m$^2$ per 2,500 M/T as the size of the machineries would not necessarily increase in line with its capacity. The building costs of various types of RPCs are presented for reference in the table below. As a caveat, it is important to note that the cost data shown in the table are circa 1990s.

Table 9. Construction Costs of RPC by Processing Capacity

<table>
<thead>
<tr>
<th>Type of RPC based on the Processing Capacity</th>
<th>M/T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,200</td>
</tr>
<tr>
<td>Land acquisition (US$‘000)</td>
<td>60</td>
</tr>
<tr>
<td>Construction of building (US$‘000)</td>
<td>188</td>
</tr>
<tr>
<td>In-loading, drying and storage facilities (US$‘000)</td>
<td>236</td>
</tr>
<tr>
<td>Milling, packaging and dust collecting facilities (US$‘000)</td>
<td>278</td>
</tr>
<tr>
<td>Electrical system (US$‘000)</td>
<td>84</td>
</tr>
<tr>
<td>Others (US$‘000)</td>
<td>141</td>
</tr>
<tr>
<td>Total (US$‘000)</td>
<td>987</td>
</tr>
<tr>
<td>Construction cost per M/T (US$)</td>
<td>823</td>
</tr>
</tbody>
</table>

Note: The exchange rate of KRW1,000 per US$1.00 was applied for convenience.

RPCs contributed to the enhancement of the quality of local rice. It also saved about 34% in processing costs and about 64% in labour input needed for post-harvest processes. The loss rate was reduced to 1% from the usual 6%. RPCs made large-scale processing of rice possible—farmers just needed to bind the rice harvest by combine and binder and then send it to a nearby RPC where a computerised weighing and drying system maintained the appropriate moisture content. As such, post-harvest processes could be completed in an RPC. As drying and storage were available at RPCs, relatively large-scale farmers devoted to rice production only emerged. The rest of the rice supply chain activities, i.e., drying, milling, packaging and even marketing, were undertaken by RPCs. The RPCs bought undried (fresh) rice directly from farmers, which underwent processing and packing and finally delivered to retailers and consumers. They even entered into contract farming with farmers in adjacent regions.

Furthermore, RPCs became the centrepiece of forward and backward linkages, as farmers organised rice producer groups around regional RPCs. Farmers benefitted from the added value of the milling and packaging processes as common regional brands began to appear around RPCs. As such, RPCs served as an effective tool that not only improved the overall quality of rice, but also tied rice farming communities together under common utilities.

2.3.2. Establishment of Saemaul Undong (SMU) factories

The establishment of SMU factories was promoted actively in 1972 in conjunction with the nationwide promotion of SMU. It aimed to close the income gap between the urban and rural areas and to sustain the growth of the rural income by developing non-farming income sources. The ultimate objective of establishing SMU factories was to mobilise idle labour to participate in the industrialisation process of rural areas. The government supported those firms that established factories in rural areas, through subsidies for construction costs, exemption of taxes, management consulting, etc. As a result, the number of SMU factories increased rapidly to 1,357 by 1983. Selected businesses for SMU factories included (1) businesses that had easy access to raw materials from the rural areas, i.e., food processing, ceramics, wood and stone carving, etc., (2) businesses that were labour intensive and had simple processing structures, i.e., textile, stuffed-toys, etc., (3) businesses that had supply chain linkages with large enterprises, and (4) other businesses that had potentials to contribute to the increase of rural income.

Despite intensive and active government support, the programme did not meet initial expectations and was ceased in 1985. Of the 1,357 factories, only 675 SMU factories survived as of 1985. The 675 firms were later incorporated into the Small- and Medium Enterprises Promotion Programmes instituted by the Ministry of Commerce and Industry.

The gravest problem for the programme failure was that it did not attract the participation of the rural people because the programme was business-centred as to people-centred. In addition, the shortfall in infrastructure, such as access roads, water, access to main markets, etc., exacerbated the operational conditions of the factories, which eventually led to business closures. Nevertheless, it set an invaluable precedent and provided many lessons for “rural industrialisation.” Seemingly, the most important lesson that the government learned was that any programme designed for rural development ought to take people’s participation into consideration at the program design stage. As they were strewn about in the rural areas, the factories were not able to sow benefits of agglomeration and scale economies.

2.3.3. Establishment of agro-industry complexes

Learning from the failure of SMU factories, the government enthusiastically set out to develop agriculture industrial complexes in 1984. Put simply, it aimed to develop small-scale industrial parks in rural areas. The objectives were more or less similar to those of the development of SMU factories. The policy aimed to develop 400 agro-industrial complexes by 2004. The government, in fact, developed some 288 agro-industrial complexes by 1997 and the occupancy rate of each complex reached about 95%.

The government support package for the development of agro-industrial complexes again was generous. In addition to low-interest loans for construction and operation, property tax imposed on tenants/investors was exempted for a year and 50% thereafter for a 5-year period.

However, the agro-industrial complex soon faced a series of challenges. The tenant firms did not have sufficient linkages to rural economies. Therefore, it was rather hard
to develop an effective value chain within the economic structure of the rural areas. Only about 15% of the tenant firms had types of businesses that could utilise available labour and factor produced in the rural areas.\footnote{Ibid.}

The most obstinate structural challenge was the changing rural demographic structure since the end of the 1980s. Tenant factories could not secure the necessary labour as the rural population was declining. This meant that the working-age population was diminishing as young people were moving to urban areas. This structural bottleneck was not one that could be easily addressed.

In addition, the agro-industrial complex had to compete for tenants/investors with those industrial complexes being developed in urban areas. Although land price was cheaper in the agro-industrial complexes, relative disadvantages arising from the locational factor, i.e. closeness to main markets, roads, access to ports, telecommunication infrastructure, and the like, were by far greater in comparison to urban industrial complexes.

In sum, the developmental scheme of agro-industrial complexes can be assessed as a partial success at best. However, the lessons learned from the cases of these complexes served as a foundation for other rural income increase programmes that followed, even though the agro-industrialisation endeavours did not reach the anticipated success level.

### 2.3.4. Development of the agro-processing manufacturing industry

Perhaps it is accurate to state that Korea’s food/agricultural processing industry evolved only in the 1980s as an industry, to fit the proper meaning of an industry—manufacturing processes and appended works based on a value chain encompassing factor suppliers to final consumers. However, the agro-processing industry was already in its infant stage in the 1970s, as domestic sales of canned foods, i.e., meat and fish, and the exports of ham, cheese, and the like, were growing.

Nevertheless, agro-processing in general was done on a smaller scale, such as at home by home-craft type household operations. Agro-processing initially was based rather on simple value-adding processes and had a limited product mix. For example, rice was merely processed for rice-cake, porridge, traditional cookies, rice-wine and liquor, and the like. Packaging also was at a rudimentary stage so the expiration period for products was very short at best if not nil.

In this period, government policies for agro-processing tended to place an emphasis on “supervision and regulation” rather than “promotion” of agro-processing and its associated industries.\footnote{MOAFRA (1999) p.2168.} Changes came in the 1990s, as more detailed and targeted policies to develop the agro-processing industry were introduced. The government promulgated the Law of the Promotion of Agro-Processing and Quality Management of 1993, providing a legal foundation for the promotion of the industry.

On the other hand, the private sector was already active. For example, food processing firms began to introduce commercial “ready-to-serve” types of processed food as retort pouches. Confined to military use in the 1970s, retort pouches were commercially introduced to consumers in the 1980s. The market soon expanded, especially after the 1986 Asian Games in Seoul and the 1988 Summer Olympic (the Games of the XXIV Olympiad) were held in Korea. The food processors had an opportunity to supply various types of retort pouches to the participants, athletes, and tourists from all over the world; the retort pouches were well received due to its convenience—it just needed to be heated with boiling water.

In addition, changing life-styles also contributed to the rapid expansion of the agro-processing industry. For example, fast foods and “ready-to-serve” type foods gradually gained popularity as time was more valued. In other words, the industry was preparing itself to seize the opportunities the changing environment presented.

### 2.4. Distribution activities

#### 2.4.1. Quality management of agro-products

To assure the quality of agro-products and to protect consumers, the government instituted schemes such as the Quality Certification, the Agricultural Product Origin Verification and the Agro-Product Standardisation. The legal foundation for the measures was the Law of the Promotion of Agro-Processing and Quality Management of 1993.

- **The quality certification**: The quality certification consisted of a two-pronged scheme—certification of the quality and safety of agro-products. The government adopted the Good Agricultural Practices (GAP) in 2006 that aimed to warrant the supply of safe and healthy foods to consumers through the systemic safety management of on-farm to off-farm activities.
GAP stood on the principle of disclosing all information that was related to the production and management of a product to its customers. Under the GAP, agro-products were traceable on a computerised database. By doing so, the scheme poised accountability to farmers for their products while garnering the consumers’ trust on farm products.

In order for a farm, or a agro-product working group, to earn a GAP certification, it had to go through rigorous testing and evaluation processes, some 110 check-items concerning safety and management standards, i.e., pesticide residue, heavy-metal residue, microbial contamination, etc., after filing an application. If passed, the farm, or the working group, was recognised as a GAP farm, or a GAP working group. Only then could it label the GAP mark on their products.

The number of GAP certified farms, or GAP certified working groups, has been increasing, as benefits of the certification have been recognised.

- **The product origin verification:** In 1991, the product origin verification scheme on imported agro-products was adopted by the GOK. As Korea’s agricultural market opened up to foreign products, some importers deceived consumers by disguising cheap and inferior quality-foreign agro-products as locally grown products. These predatory practices obviously distorted the distribution structure of agro-goods. Facing public outcry for foul plays from both local farmers and consumers, the GOK adopted the agro-product origin verification scheme and delegated management and control authorities to the Customs Office and the City and Provincial Government.

To eradicate abusive practices of disguising and masking product origins, various market monitoring systems were adopted. For example, consumer hotlines were set up so that consumers and consumer organisations would be able to easily report faulty practices to the authorities. The GOK even established the Judicial Police Units to stop the deluding practices.

- **The agro-product standardisation:** As a result of economic growth, consumer demand for high-quality agro-products increased in the 1990s. However, quality standards for agro-products were not established, which inhibited the further growth of agricultural markets. In addition, some farmers, wholesalers, and retailers deceived consumers, which caused consumer confidence in local agro-products to plummet.

To curb the falling confidence levels, farmers and working groups voluntarily established their own quality standards and developed their own brands. Nevertheless, these voluntary standards lacked uniform and acceptable specifications, and thus failed to uplift consumer confidence. In addition, untruthful, misleading, and often deceptive practices that were exercised by some farms exacerbated the declining level of consumer confidence.

Amid such a rift between consumers and farmers, the government stepped in to establish agro-product size and quality standards to mend the declining level of consumer confidence on local agricultural products. The government understood that quality and size standards were key to improving the competitiveness of local agro-products that were facing severe international competition and hence established the National Agricultural Products Quality Management Service (formerly known as the Agro-Product Inspection Office).

The government established a grading standard for agro-products based on the nation-wide quality, size, and end-use standards, which included standardised packaging in order to maintain consistency of quality, quantity and size. Due to the nature of the agro-products, i.e. ununiformed quality, perishability, etc., the establishment of a quality standard scheme was certainly not an easy task. Nevertheless, it was a necessary measure that obviously enhanced the competitiveness of local agro-products as well as raising consumer confidence levels.

### 2.4.2. Re-organising wholesale network for agro-products: Establishment of public wholesale markets

Before the 1980s, market information, i.e., price information, of agro-products’ distribution channel was dominated by middle-men (traders). Because of this asymmetrical information structure, farmers were not able to exercise any bargaining power, which also contributed to price distortions.

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73 Ibid., p.2010.
The distribution channel consisted of the following actors: farmer $\rightarrow$ small-scale trader $\rightarrow$ large-scale trader $\rightarrow$ wholesale market $\rightarrow$ small-scale wholesaler $\rightarrow$ consumer (Figure 20 (a)). As such, the channel was highly complex and costly. Small-scale traders operating in the farming areas usually collected agricultural products from farmers at a low price and sold them to large-scale traders operating in adjacent cities. Large-scale traders also frequently went around the farming areas and directly purchased agro-products from farmers. These large-scale traders then aggregated the purchases and sold them to informal wholesalers who normally operated in large urban areas. As briefly stated, small-scale traders, and often large-scale traders, too, operated in the same farming areas. But on top of that, the concurrent existence of NH wholesalers, general wholesalers, as well as informal wholesalers added further complications to the already complex agro-commodity transaction channel. Until the early 1980s, wholesale transactions were primarily dominated by informal wholesalers. In 1982, there were about 74 informal wholesale markets in Korea whereas NH had only 63, and the general wholesale market 47. The informal wholesale markets posed a number of problems. For example, transactions were mostly conducted through closed spot contracts between sellers and buyers, so that both buyers and sellers were exposed to high transaction risks. They also lacked physical infrastructure, i.e. parking, loading, unloading area, refrigeration storage, etc.; thus, goods that changed hands in the markets were exposed to unhygienic conditions.

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Informal wholesalers refer to those who were licenced only for retail but who, in reality, were engaged in illegal wholesale activities.

General wholesalers refer to those wholesalers invested by the private sector. They were government-licenced entities just like NH wholesalers. The transaction principles of both general wholesalers and NH wholesalers were based on consignment auctions, which served the farmers’ best interests. However, informal wholesalers still relied on “on-the-spot dealing.”


Informal wholesale markets were also controlled by a few large-scale traders who created and controlled their networks of small-scale wholesalers and traders. They were obviously oligopolies and were always susceptible to risks of supply shock and price volatility. Under such market conditions, only large-scale traders stood to gain as they monopolised market information and controlled important tiers of the distribution channel—the small-scale traders, the small-scale wholesalers, and the wholesale market (informal wholesalers). Their monopoly and control capacities enabled them to manipulate prices also. In contrast, farmers and consumers became victims of an unfair market.

As the production and demand for agro-commodities rapidly increased in the 1980s, the GOK decided to stabilise the agro-commodity distribution channel by reforming and re-organising the wholesale market which was engendered by fast income growth, industrialisation, and urbanisation. The Law on Distribution and Price Stabilisation of Agricultural and Fisheries Products of 1976 was the legal base of the change.

But, why focus on the wholesale market? It was because the wholesale market was the centrepiece of the agro-commodity distribution channel. The wholesale market was supposed to benefit farmers, retailers, and consumers, as they could gain from price transparency, scale economies yielded through the auction system and large volume transactions if the market were to function properly and fairly based on rules.

Another reason for the reform of the wholesale market was the high transaction costs that farmers, retailers, and consumers incurred. Unlike the demand for manufactured goods, the demand for agro-commodities was price-inelastic and agro-goods were, in general, perishable. Thus, the frequency of transactions for agro-commodities in a given time period was higher than manufactured goods as transactions of agro-commodities were conducted on a daily basis due to the nature of the commodities—the price inelasticity of demand and the perishability.

The majority of Korean farmers were mostly small-holders whose volume of shipment tended to be relatively small. Given this small volume, the frequency of shipments/transactions was high, and this meant a high transaction cost for all. One viable way of reducing the transaction cost, inter alia, was to minimise the length of the channel. By enhancing the role of the wholesale markets, channel lengths could be reduced—practically eliminating the intermediaries—so that transaction costs could be minimised.

Based on this background, the GOK set out to modernise the wholesale market as a measure for wholesale market reform. The establishment of public wholesale markets began, in 1985 and, by 2008, some 33 public wholesale markets were built in the major cities around the country. In 1985, the first public wholesale market was built in the capital city, appropriating the central government budget, local government budget, and loans from the International Bank for Reconstruction and Development (IBRD). The United Nations Development Programme (UNDP) provided consultation plans for establishments.\(^{78}\) The new wholesale markets made significant improvements not only in the physical conditions but also in the transaction mechanism.

To address the information asymmetry and to promote price transparency and efficiency, the new public wholesale markets adopted a new pricing mechanism such as the fixed price, negotiated transaction system to minimise the probability of price volatility. In the 2000s, an auction information system was added to the transaction mechanism to assure the transparency of transactions.\(^{80}\)

The emergence of new wholesale markets entailed a reduction of the channel length to 4-5 tiers from 6-7 tiers, resulting in a reduction of transaction costs (Figure 20 (b)). The new wholesale markets absorbed and replaced agro-commodities transactions assumed by the informal wholesale markets. This led to plummeting volumes of agro-commodity transactions conducted through informal wholesale markets from 51% in 1982 to 19% in 2010.\(^{81}\) The new wholesale markets set a daily settlement of accounts. That meant that proxy trading firms for the sellers (farmers) had to settle accounts on the day the transactions were completed. This significantly reduced the risk of non-payment that used to occur in informal wholesale markets.\(^{82}\)

As such, the new wholesale markets contributed to the establishment of a new system and a new market order that benefitted all the stakeholders involved in the agro-commodity distribution channel.

\(^{78}\) MOAFRA and KREI (2014) p.21.
\(^{80}\) By principle, all public wholesale market transactions go through an auction. However, for those agro-products that missed the auction due to certain reasons such as late deliveries or palleted goods were allowed to be traded outside the auction floor. In this type of trade, products were traded either at a fixed price (the tag-price) or through negotiation with the buyer/s.
\(^{81}\) Ibid., p.27.
\(^{82}\) Ibid.
2.5. Cross-cutting issue: agriculture finance

As discussed in the preceding chapter, private loans were the main mode of lending in rural areas until government-led institutional financing intervened in the 1960s. Prior to that, most Korean farmers relied on informal lending, which tended to be predatory, as institutional financial establishments lacked appropriate lending capacity.

In 1962, the government re-organised the agricultural co-operative and associated establishments and institutions. The Federation of Agricultural Co-operatives and the Agricultural Bank merged and was re-established as a multi-purpose co-operative, the National Federation of Agricultural Co-operatives (NH). The emergence of NH was an important juncture in government policies concerning agricultural finance for it assumed a crucial role in agricultural finance in Korea.

As stated, NH has emerged as a formidable institution for agricultural development in that it performed lending services and purchasing activities, such as the purchasing and distribution of input materials including fertilisers, farming equipment, seeds, etc. In addition, NH also exercised the role of wholesaler and retailer, linking farmers and consumers based on consignment. Thus, NH, in reality, performed all the business activities in the agro-commodity supply chain. This enabled NH to establish a system of effective coordination and linkage among its lending practices, purchasing activities, and marketing performances.

NH—a multi-purpose cooperative, an integrated entity of agriculture finance and cooperative businesses—left an indelible mark on the amelioration of poverty levels in Korea’s rural areas. It created a virtuous cycle of development through the lending of “seed money” to farmers for the acquisition of essential farming inputs with favourable terms and conditions. Utilising NH loans, farmers, in turn, were able to improve their income positions so that they could repay the loans in good faith.63

2.5.1. Policies on agriculture finance: The Agriculture Development Fund

Proper government policies for agriculture finance were released with the promotion of the 1st 5-Year Economic Development Plan in 1962. During this period, the GOK’s agricultural development policy fund was the main source of agriculture finance as private sector capital formation fell far too short to meet the credit needs of the agricultural sector and nearly no alternative sources of mobilisable capital were present. However, the government provided loans for farmers through agricultural development policy funds for agro-inputs and farming facilities. This in fact led to a dramatic increase in agro-productivity and the subsequent rise of the farmers’ real income levels.64

The GOK provided short-term loans for fertilisers, seeds, and essential farming tools. As for large agricultural machines, equipment, and projects like land re-arrangement, the government provided medium- and long-term loans. Furthermore, the government enlarged the scope of the on-credit-purchase programme operated by NH, especially for the chemical fertilisers that helped increase agro-productivity.

In the late 1960s, the size of the government-run Agriculture Development Fund was enlarged as there was an influx of private sector capital into NH. As the government’s borrowing from NH was a major contribution to the fund’s sustainability, an increase in NH deposits meant an increase in mobilisable resources for the fund. The enlarged private sector deposits in NH was attributable to the government’s rationalisation of the market interest rate announced in 1965. In fact, the government raised the interest rate about two times higher than the then on-going rate. As a result, the money circulated in the private sector’s (underground) capital markets flew into institutional banks. The government indemnified spreads between NH’s deposits and the lending rate to farmers, in addition to the principal. In addition, NH, underpinned by the enlarged deposits, tapped into the capital market and mobilised needed capital (Figure 21).65

The GOK’s Agriculture Development Fund was aided by the investments of USAID, the ADB, and the World Bank. The international institutions facilitated NH to re-direct the use of their development assistant funds to agricultural development (Figure 21). These long-term development funds were made available as long-term loans to farmers through NH.

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63 Generally speaking, the default rate was very low—less than one percent—with the exception of such an unusual time of financial distress as the Asian Financial Crisis in 1997, the Global Financial Crisis, etc. For example, in 2012, the number of farmers/fishermen in default was about 29,023, or about 0.34%. However, the delinquency rate was much higher—about two to three percent—and went up to about five percent in the time of financial difficulties. Source: Eoh Kyung-in (2014) “The number of NH co-op members with bad credit numbers about 30,000 annually,” The Gangwon Mirae Daily, 25 August 2018, http://www.gwmirae.kr/news/articleView.html?id=snr=367 (Access date: 10 November 2018); Park Sung-jae (2018) Personal interview.


65 Ibid., p.874.
The expansion of the policy fund for agricultural development accelerated and funds intervened primarily in the areas where market failure occurred, and where the credit needed for agricultural facilities, acquisition of agro-machinery, short-term expenses for farm operations, etc. could not be facilitated by general commercial banks or even mutual credits. Needless to say, agriculture was, and is, inherently a high-risk industry. Thus, commercial banks often avoided extending credits to farmers, which created the need for government intervention to account for the market failure.

In the early 1970s, the GOK borrowed mainly from the Bank of Korea for the operation and sustenance of the agricultural policy fund as government contribution (budget support) was insufficient. However, the agricultural policy fund enlarged when the deposits in NH were invested into the policy fund as were government funds from a trade surplus in the late 1970s.

The policy fund concentrated on rice farms in the 1970s in order to aid the achievement of rice self-sufficiency. However, it gradually expanded to fruit orchards, vegetable farms, and livestock farms. As the mutual credit system was strenuously taking root in rural areas, the government policy fund emerged as one of the two wheels of the mutual credit system. NH’s agricultural credit/lending activities was increasing agricultural productivity. In the mid-1960s, NH focused on short-term loans, and, in the late 1960s, shifted to mid- and long-term credit including credit guarantees.

The foundation of NH’s agricultural lending based on coop-centred financing was set in the late 1960s when it adopted the mutual credit finance system. Mutual credit was a borrowing/lending system mainly for the members of the primary co-ops. In the initial build-up stage, it absorbed idle cash floating in rural areas and non-working private sector capital that used to serve as the source of predatory informal lending. The advent of the mutual credit system was an important milestone in the development of agricultural finance in Korea. The gravity of agricultural finance severed government dependency and shifted to primary coop-centred financing.

The mutual credit system expanded rapidly. NH’s lending from the mutual credit account increased to 49% in 1980, to 66% in 1985, and 82% in 1990. An average growth of lending was about 41% or above in from 1975 to 1990. In contrast, the farmers’ reliance on private loans drastically decreased to 14% in 1990 from 49% in 1980. As such, the institutionalised agriculture financing crowd out extending informal lending in the rural areas. It is safe to say that the institutionalised foundation of access to rural credit in Korea was now completely anchored.

2.5.3. Establishment of the agriculture-fishery credit guaranty and the credit-risk management

As stated in the previous section, agricultural finance is a high-risk area. Although NH served the public good through agricultural loans, namely for the agricultural sector development, it was also important for NH to protect their funds and/or assets from depletion. In other words, risk management, especially regarding credit risk, was also an important task.

The terms and conditions of NH’s loans as well as the agricultural development fund they administered and controlled have changed over time. Nevertheless, the agricultural development fund loans were extended up to approximately US$10,000 based only on one’s credit rating without collateral. In excess of $10,000, up to US$20,000, at least one co-signer was required.

| The maturity for agricultural loans varied on the type of loan programmes. Nevertheless, in general, the maturity of a short-term loan was usually a year while that of a mid-term loan was about five to seven years. For long-term loans, maturity term was extended to 20 years for example, 3-year deferment, 17-year instalment payments. | MOAFRA (1999) p.874. |
| The exchange rate of KRW1,000 to one US dollar was applied for convenience. The loan limits and the appended conditions herein were for the year 2000. | Ibid; See also Table 6 in p.24 in Chapter 2. |
To supplement the ease of the agriculture policy fund and mutual credits, the GOK promulgated the Law of Credit Guaranty for Farmers and Fishermen of 1971 (Law No. 2277), on which the Credit Guaranty Fund for Farmers and Fishermen was established. The annual premium for the guaranty was 0.3% for a 3-year guaranty period and 0.2% if the guaranty was extended beyond three years. Farmers and fishermen could apply for the underwriting of a credit guaranty to NH. This measure was designed to facilitate the ability of farmers and fishermen who were unable to provide any means of security, collateral or co-signers to support loan applications to obtain funding.

Those facilities necessary for agricultural activities, such as glass greenhouses, storage, agro-processing factories, etc., would be financed on an after-acquired collateral basis. That is, farmers obtained loans for the construction of needed facilities upfront and upon completion, used these facilities as security.

Before 1966, the GOK banned the use of lands owned by farmers as collateral, as it feared that the farmers, who were mostly small-holders in deep poverty would sell their lands, and thus a vicious landlord-tenant structure would be re-established. Nevertheless, to facilitate those farmers’ financial needs whose only valued assets were lands, the GOK promulgated the Law of Agricultural Land for Collateral of 1966 (Law No. 1813), whereby the lands could be used as collateral only on NH loans.

As such, NH and the GOK institutionalised preventive measures for credit risk by establishing a credit guaranty system. By doing so, they reduced credit risk as well as the possible burdens of an individual farmer for providing security on his/her own for agricultural loans.

2.5.4. The role of NH in agriculture finance

Until the early 1970s when agriculture finance was finally institutionalised, NH, on behalf of the government, played a crucial role in agriculture finance as to underpin farmers’ access to finance. Needless to say, NH was the linchpin to the agricultural sector development in Korea and its lending activities served as an engine of agricultural growth. It surely served to the end of the public good. NH went beyond the purview of a general co-operative by acting as a public entity. Then, how was it possible?

To re-iterate, NH was created as a multi-purpose co-operative in which lending/credit extension services were an important business model. When NH was created through a merger of the National Agricultural Co-operatives Federation and the Agricultural Bank in 1962, the credit provision for member co-op and non-members was already built in as an important attribute of the institution. In fact, NH’s commercial banking operation was a linchpin of agriculture finance as it funnelled available credit from the urban areas to the rural areas through its commercial banking operations. Thus, procurement of credits from other capital markets was possible as NH was able to borrow credits against its fixed deposits, which, in turn, was disbursed to primary co-op members as loans.

NH was a nation-wide organisation with its member co-ops and branches being the smallest unit of political/administrative divisions. It not only facilitated access to finance for farmers but also significantly reduced default risk. Furthermore, it permitted NH to exercise the advantage of scale economies even in the banking and mutual credit operations, just like in its procurement/purchase and marketing/selling activities.

Scrutinising the growth trajectory of agriculture finance in Korea, there would be no argument that NH played a crucial role by creating and anchoring the rural credit system. Also, it was NH’s financial/banking arm that made NH to be a successful multi-purpose co-op.

3. Post-Rice Self-Sufficiency Era Re-Visited

The post-rice self-sufficiency era can be depicted as an era of accelerated growth in the agricultural sector and sustained rice self-sufficiency. If production processes were the emphasis in the rice self-sufficiency era, re-organisation, reformation, and encouragement of other value chain activities was the emphasis in the post-rice self-sufficiency period.

In addition, the shift of the gravity of value chain activities in the agricultural sector began to take place, in particular, the power to decide what to cultivate shifted to the market where farmers as well as consumers began to voice their demands. Farmers’ discontent in planting the Tong-il rice varieties was one such example. In the wake of an outcry of smouldering discontents, the government had to listen to the voice of the market, despite still being the most powerful actor who dictated and controlled the agricultural value chain. The result of the facilitation of market
demands was an accelerated research and development (R&D) process and a series of new rice varieties was introduced. As a matter of fact, the introduction of the new rice varieties that replaced the Tong-il varieties continued to make rice self-sufficiency possible, even though the government had stopped the procurement of the Tong-il rice in 1992. It symbolised the change in government policy attention from quantity to now quality.

To improve efficiency and quality, the government initiated the enhancement of rice distribution and processing channel by building RPCs and establishing public wholesale markets. In addition, the Quality Certification, the Agricultural Product Origin Verification and the Agro-Product Standardisation schemes were implemented in order to improve the quality of agro-products. SMU factories and agro-industrial complexes were also encouraged.

Although they have not produced visible results in terms of agro-processing and the increase of rural area income, the factories served as a stepping-stone to the rise of a burgeoning agro-processing industry.

Additional endeavours that were made for input provision and the production dimension was an increase of efficiency and productivity that was attributable to the policies of the ALRC and the subsequent agro-mechanisation. They obviously contributed to the amelioration of negative impacts brought to the rural areas from the changes in the demographic structure.

The most significant accomplishment that the government achieved in the development of the agricultural sector in this period was perhaps to anchor the rural credit system. It drove out the underground extortionary private lending practices from the rural areas by establishing an institutionalised rural credit system. To this end, the role of NH should not go unnoticed. NH, along with the government-run agriculture development fund, created and institutionalised the agriculture financing system. NH also left an indelible mark on the whole value chain activities, starting from input provision to distribution of rice and other agro-products. Indeed, NH accounted for the largest share of movement of rice in the distribution channel. It moved the lion’s share of rice production through the distribution channels it established, about 40.2% of the total, excluding the government procurement of 12.7% (Figure 22).

**Figure 22. Share of Rice Distribution by the Respective Channels**

```
<table>
<thead>
<tr>
<th>Channel</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gov’t procurement</td>
<td>29.5%</td>
</tr>
<tr>
<td>Private RPC</td>
<td>20.3%</td>
</tr>
<tr>
<td>WHolesale</td>
<td>16.8%</td>
</tr>
<tr>
<td>NH</td>
<td>40.2%</td>
</tr>
<tr>
<td>Public Auction</td>
<td>12.7%</td>
</tr>
<tr>
<td>NH Wholesale</td>
<td>(5.0%)</td>
</tr>
<tr>
<td>NH Retail</td>
<td>(10.2%)</td>
</tr>
<tr>
<td>Large-scale consumer</td>
<td>(26.8%)</td>
</tr>
<tr>
<td>NH retail</td>
<td>(53.5%)</td>
</tr>
<tr>
<td>Public Auction</td>
<td>(5.0%)</td>
</tr>
<tr>
<td>Whitelabel</td>
<td>(10.2%)</td>
</tr>
<tr>
<td>Large-scale</td>
<td>(21.7%)</td>
</tr>
<tr>
<td>Private RPC</td>
<td>(5.0%)</td>
</tr>
</tbody>
</table>
```

Note: The number in the parentheses are estimated.
Uncertainties arising from internal and external changes reigned over Korea’s agricultural sector in the mid-1990s and through the onset of the new millennium. Starting in 1995, Korea was obliged to import rice under the Minimum Market Access (MMA) agreement in the Uruguay Round Agreement on Agriculture (UR AoA) at an annual increase of 0.25% in the period from 1996 to 1998 and 0.5% up to 4% in the period from 2000 to 2004. This was subject to re-negotiation in 2004 when the scheme was to expire. The mandatory MMA import for 1995 was equivalent to 1% of the average domestic consumption during 1988 to 1990 (Table 10). However, a full liberalisation of the Korean agricultural market, and the tariffication of rice, was bound to occur, which posed a new set of rules of the game in the agricultural sector.\footnote{The tariffication of rice at the rate of 513% was initiated from 2015, as the 20-year delayed tariffification expired in 2014. However, the mandatory import quota of 408,700 M/T was still maintained at 5%}

A significant structural challenge that was developing was the dropping consumption of rice. The annual per capita consumption of the main staple, rice, declined to 106.5kg on average in 1995, 93.6kg in 2000, 72.8kg in 2010, and 62.9kg in 2010 from 132.4kg in 1980. The average yields during 1980 to 2015 was maintained at about the level of 5 million M/T (Figure 23).

Although the total size of rice paddies dropped from 1,233,038ha in 1980 to 979,717ha in 2005, the national inventory of rice continued to increase as the declining consumption rate of rice was faster than the volume of production.

The increasing level of national rice stock coupled with the MMA imports inevitably led to a decline in the price of rice, which in turn, engendered the decrease in rural area income. Hence, it became necessary to identify the impetus to bolster rural area income in all tiers across rice value chain activities as well as the agro-product value chain as a whole. Furthermore, facing the liberalisation of the agricultural market and the subsequent influx of low-priced foreign imports vis-à-vis domestic agro-products, the development and further strengthening of global competitiveness across all tiers of agro-value chain activities has become an utmost exigency for Korea’s agriculture to survive.
1. Continued Efforts on Strengthening Agro-Value Chain Activities

1.1. Production dimension

1.1.1. R&D

As discussed in previous sections, the rice breeders have addressed the changing preferences of consumers by introducing new rice varieties. Nevertheless, the declining trend of rice consumption was accelerated for other reasons such as the introduction of various time-saving alternatives to the traditional staple including breads, milk and other dairy foods, breakfast cereals, and the like. In other words, the changes of life-patterns in urban settings caused concomitant downward changes in rice consumption. In addition, a new pattern arose of less carbohydrate in-take due to economic growth and changing life-patterns such as a less active urban life style. In sum, fundamental changes in dietary patterns and structure were shaping the levels of rice consumption.

Indeed, a survey conducted by the Rural Development Administration (RDA) on a sample of 1,017 consumers disclosed that they were consuming less rice because they did not have enough time to cook and eat rice as a meal. Also, the respondents wanted to lose weight by consuming less carbohydrates. To the question “Why the reduced rice consumption this year?” the respondents indicated that they reduced rice consumption because they “did not have enough time (45.5%)”, “wanted a diet plan to control obesity (43.7%)”, “had alternative foods to consume (25.0%)”, “lost appetite (24.2%)” and “did it for a balanced in-take of nutrients (13.1%).”

Numerous other studies à la RDA’s have drawn important implications. In particular, the gravity of the rice value chain had shifted from production to consumers. While the government’s policy foci were set on high rice yields so that the level of food self-sufficiency was improved, consumers’ needs changed to the pursuit of quality and diversity of foods. In addition, the demand for convenient foods was on the rise.

Amid these changes, agricultural R&D dealt with such grave challenges as the liberalisation of the domestic market, the decreasing consumption, the need to improve the level of grain self-sufficiency, in addition to the climate changes and other compelling issues. Nevertheless, an overarching objective of R&D was undoubtedly shifting to the breeding of high-quality rice, thus the high added value that catered to the needs of the consumers. The responses to the changes entailed the introduction of various rice varieties, such as functional rice, coloured rice, and rice for agricultural raw materials for other industries. As such, R&D indeed played a crucial role in the transition from quantity to quality in the rice value chain.

1.1.2. Horticulture as an impetus for the income increase in the rural areas

The rapid urbanisation in Korea rendered opportunities to farmers, who started to build a corps of vinyl greenhouses adjacent to large cities. Thus, they were able to supply mainly fresh produce to urban consumers all year round; consumers were able to shop for cabbages, lettuce, roses, and tulips at the market even in the winter. Vinyl greenhouses enabled farmers to extend fresh produce growing seasons to nearly the entire year, hence the term “White Revolution” came about, adopting the colour of the greenhouse’s polyethylene film. Horticulture became a significant source of income for farmers through the utilisation of vinyl greenhouses.

The emergence of vinyl greenhouses in horticulture can be traced back to the 1960s when it was first encouraged as a driver to raise rural area income. However, the market for fresh produce did not grow enough to meet the anticipation as the disposable income level of general consumers was not high enough to bolster the market. An opportunity for growth in the sector came about in the 1980s when rice self-sufficiency was achieved, and rapid economic growth took place. The size of vinyl greenhouse horticulture grew to 7,322ha in 1980 and to 78,469ha in 2010 from 736ha in 1970.

In the 1990s, the vinyl greenhouse horticulture sector was designated by the government as a strategic sector that could serve as one of the agricultural growth drivers with global competitiveness. The GOK set out to support the sector with modernisation plans including the erecting of a cold chain. An immediate modernisation plan included the building of a weather control system for the production process in greenhouse horticulture. As a result, the quality of fresh produce was largely improved.

The government provided various support programmes for the export of fresh produce and flowers, including subsidies for the preservation costs of vegetables and flowers, logistics, overseas cold-storage, etc in order to maintain the freshness of all their products. By doing so, the export of fresh produce ascended from US$7.7 mil-

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lion in 1992 to US$237.2 million in 2015. The rise of vinyl greenhouse horticulture sector triggered dynamic activities across the entire value chain, starting from the supply of seeds and the sale of construction materials, fertilisers, pesticides to the employment of databases and production and management consulting, etc. Thus, the market size of horticulture inputs was expanded to approximately US$11.2 billion in 2013 from US$425 million in 1995.

1.2. Processing manufacturing: agro-products as factor of production

As discussed, the consumption of rice has been continuously falling. A recent statistic shows that annual per capita consumption dropped to 62.9kg in 2015—a decline of more than 50% compared to that of 1980. While the share of household consumption showed a declining tendency, the share of the consumption of rice as raw materials demonstrated an inclining trend. The annual per capita consumption of rice in the processing manufacturing sector was estimated to ascend to 8.9kg in 2014, or about 48.3%, from 6kg in 2010. As of 2014, the household consumption of rice accounted for about 55%, restaurants about 33% and processing manufacturing about 12%. And, as the household consumption was slipping downward, the key to increase of the rice consumption would be sought in the rice processing manufacturing sector.

### Table 11. Change in Sales of Rice Process Manufacturing

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2014</th>
<th>+/- (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Sale (US$ mill)</td>
<td>Total Sale (US$ mill)</td>
<td>+/- (%)</td>
</tr>
<tr>
<td>Rice cake</td>
<td>1,100</td>
<td>1,390</td>
<td>33.3</td>
</tr>
<tr>
<td>Cooked rice</td>
<td>160</td>
<td>1,333</td>
<td>31.9</td>
</tr>
<tr>
<td>Rice wine and spirits</td>
<td>187</td>
<td>822</td>
<td>19.7</td>
</tr>
<tr>
<td>Food ingredients*</td>
<td>178</td>
<td>117</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Notes: * includes rice porridge; The Korean currency (KRW) was converted at KRW1,000 to a US dollar for convenience.


The manufacturing of rice cake and cooked rice accounted for about 65% of the total sales in the rice process manufacturing industry (Table 11). It is interesting to note that the total sales of the cooked rice sector increased about 733% during 2008-2014. This was attributable to a fast expansion of the convenient food market. For example, cooked rice packed in polypropylene packaging material can render extended storage time in addition to its convenience as it can be served simply by heating it (Figure 24). As the demographic structure was changing and the size of the household shrunk, the convenient food market, known as the home meal replacement (HMR) market, led especially by the retort foods, was expanded to about US$2.25 billion in 2016—about 34.8% growth compared to US$1.67 billion in the preceding year. The HMR market in Korea has grown at an annual average of about 14.5% since 2010. The size of the agro-processing manufacturing market has now grown big enough to attract large enterprises. Indeed, such Korean conglomerates as CJ Cheiljedang, Nongshim, Lotte Foods, and the like began to enter the market.

Fuelled by the changing demographic structure, the growth of the convenient food market has continued to expand. The average size of the household diminished from 5.2 in 1970 to 2.5 in 2015. One-person households increased from 4.2% in 1975 to 28.6% of the total house-
holds in 2015. Two-person households also increased from 9.7% in 1970 to 26.1% in 2015 (Figure 25).

The fast growth of the rice processing manufacturing sector included the concomitant increase of rice consumption. The demanded quantity for rice as a factor for the processing manufacturing industry increased to 234,125 in 2011 and to 245,888 in 2014 from 110,124 in 2008.99

Before 1980, the use of rice as factors for processing manufacturing was prohibited due to the paucity of supply. However, the achievement of rice self-sufficiency has changed the entire policy framework. Facing the changing environment, the GOK, initiated by the MOARAF, set out to promote the rice processing manufacturing industry by promulgating the Law of the Promotion of Rice Processing Manufacturing Industry and the Use of Rice (a.k.a. the Law of Rice Processing Manufacturing) in 2011. The law provided a legal infrastructure of the promotion of the industry. Indeed, the market price of rice, as itself, would be around US$20 per 10kg bag. About US$100 would be added if 10kg rice was processed as rice-cake and approximately US$190 if processed as distilled liquor/spirit (Figure 26).

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as the industry grew to the total sale of US$191 billion in 2015 (Figure 27). As a new development, the rapid growth of the restaurant business sector was noted. It surpassed the growth of processing manufacturing; as of 2015, the sector recorded about US$108 billion while food processing posted the sales of approximately US$83 billion.

Figure 27. Growth of Food Industry, 2005-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Food processing</th>
<th>Restaurant</th>
<th>Total food industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>89,302.7</td>
<td>107,514.4</td>
<td>206,817.1</td>
</tr>
<tr>
<td>2006</td>
<td>107,514.4</td>
<td>119,923.6</td>
<td>227,438.0</td>
</tr>
<tr>
<td>2007</td>
<td>119,923.6</td>
<td>130,636.5</td>
<td>250,559.1</td>
</tr>
<tr>
<td>2008</td>
<td>130,636.5</td>
<td>143,715.2</td>
<td>274,351.7</td>
</tr>
<tr>
<td>2009</td>
<td>143,715.2</td>
<td>152,435.1</td>
<td>296,150.3</td>
</tr>
<tr>
<td>2010</td>
<td>152,435.1</td>
<td>156,870.1</td>
<td>309,305.2</td>
</tr>
<tr>
<td>2011</td>
<td>156,870.1</td>
<td>163,745.2</td>
<td>320,615.3</td>
</tr>
<tr>
<td>2012</td>
<td>163,745.2</td>
<td>171,990.5</td>
<td>335,735.7</td>
</tr>
<tr>
<td>2013</td>
<td>171,990.5</td>
<td>163,745.2</td>
<td>335,735.7</td>
</tr>
<tr>
<td>2014</td>
<td>171,990.5</td>
<td>156,870.1</td>
<td>328,860.6</td>
</tr>
<tr>
<td>2015</td>
<td>163,745.2</td>
<td>151,990.5</td>
<td>315,735.7</td>
</tr>
</tbody>
</table>


Encouraged by the expanding domestic market and the advancing technologies for food processing manufacturing, the private sector firms began to expand overseas. In 2017, the firms exported US$1.98 billion worth of the agro-product processing manufacturing products. Although it was yet a small share in the total exports, the market prospect for continued growth in both the domestic and global markets was highly anticipated.

A palpable development after the 1990s in the agro-value chain is that the production activities are now pulled by the processing manufacturing activities, which are, in turn, shaped by consumers and consumer behaviours. In other words, the gravity of the value chain activities has completely shifted to consumers. This change is a distinct difference of the agro-value chain activities of the contemporary from the rice self-sufficiency era.

1.3. Distribution

The change in the structure of economy and demography obviously affected the distribution activities of the agro-value chain. For example, growth of the convenient store was conspicuous. The growth rate was estimated at 33.3% in 2015; whereas, it was 20.7% in 2011 (Figure 28). Thus, packaging had to be done in a smaller unit. Conventionally, rice used to be packed in an 80kg bag. Now, a smaller quantity-unit packaging—1kg, 5kg, 10kg and 20kg—became common.

Figure 28. Growth Rate of Various Off-Line Distribution Channels

The change in technology also led to a concomitant change in the structure of the distribution channel. The on-line channel based on mobile equipment grew rapidly after 2010. As of 2015, the mobile-based market in Korea was estimated to be about US$25 billion, having grown at an annual average of 149% since 2010.102

Consumers now have access to both on-line and off-line market-places, creating an emergence of a new distribution channel, namely the omni-channel distribution system. It is an integrated distribution system that provides seamless shopping experience using on-line and off-line channels. Consumers are able to shop the products of their choice through any channels they need.

Integrating with advancing ICT technologies, i.e. big data analytics, near-field communication (NFC), location-based services (LBS), the omni-channel system will soon rise as the centre-pole of the distribution channel/model.

The advancement of the distribution system led to a concomitant rise of the distribution and logistics industry. The firms in the distribution and logistics industry compete to deliver the consumer’s orders within 24 hours. This obviously contributes to the expansion of fresh produce market as well as other agro-products. Integrated with the ICT technologies, the actors in the distribution and logistics channel is now evolving as one of the most important actors in agro-value chain.

An effective medium for farmers to be prepared for the time of the omni-channel system was to create common brands on the agro-products they cultivated, just like the

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102 NH (2016) p.56.
brands of rice appeared around RPCs. The common brand represented the regional characteristics and the quality of specific agro-products. The NH’s “K-melon” was one of the most successful common brands in Korea. NH dominated the local melon market and achieved annual exports of US$1 million using the brand. Needless to say, positive brand images are directly translated into high probability of consumers’ choice of that particular product. The use of the brand leads to a win-win structure for farmers and consumers. Farmers retain the burden of responsibility on quality and safety of agro-products while consumers know that they are buying quality assured and safe products warranted by the brand. As farmers and local government entities have become aware of the value of common brands, some 4,340 cases of registration of common brands for agro-fishery products were filed to the Korea Intellectual Property Office during 2007-2017.

2. Cross-cutting Issues

2.1. Improving information access

Since the onset of the 1990s, Korea has emerged as one of the global leaders in the ICT area and has been setting up the nation-wide ICT infrastructure in a relatively short period. The ICT sector now serves as not only the medium for value addition by enhancing efficiency and productivity, but also the industry acts itself as the driving force of growth in the upcoming decades.

Through the application of intelligence information, the GOK envisioned to achieve the building of high-tech agriculture yielding high added value. Based on the vision, it has promoted the convergence and integration of ICT and other cutting-edge technologies with agriculture and the rural areas. By converging agriculture with such leading-edge technologies as the ICT technologies as well as the bio, nano, environmental, space and cultural technologies, the converged agriculture would anticipate the yield of high added value across the agro-value chain.

In short, the GOK envisaged the transformation of agriculture to smart farming, whereby it would yield an increase in productivity and quality improvement of agro-products. For example, the adoption of the ICT technologies to greenhouse horticulture led to, in general, about 29.9% increase in yield and 46.8% in the rural area income.\(^{103}\) The “smart greenhouse” controlled and optimised temperature, moisture and carbon dioxide (CO\(_2\)) levels and other environmental conditions for cultivation and farming via sensory devices. It also collected data on the internal and external conditions of the greenhouse that could be utilised for productivity enhancement.

![Figure 29. Schematised Diagram of Smart Farming](image)


In order to account for information asymmetry in the agro-value chain, thus to yield supply, distribution and consumption surplus, the government and quasi-government institutions established information portals to support the farmers. Some of the main sources of information, inter alia, are presented in table 12.

To account for the “information divide” in the rural areas, the Ministry of Safety and Interior initiated the Informationised Village Programme (named as the Information Network Village, INVIL) that aimed to address the information (digital) divide, the re-vitalisation of regional economy and the improvement of quality of life in the rural areas. Since 2001, the ministry has designated 348 informationised villages as of 2016.

The “Invil Festa,” among others, seems to be the most rewarding programme. It is an on-/off-line programme that links the urban consumers and farmers in the Invils. It promotes respective informationised villages via the internet and opens a 3-day off-line farmers’ market in the village where consumers visit and shop agro-products of the region (Table 13). It is an annual agriculture festival targeting the development of a close and intimate communication channel between the urban consumers and farmers. Thus far, the return of the programme seems to be rewarding. It not only helped farmers develop direct sales, but also increased farm tours and eco-tourism. All these activities obviously translated to raising the rural area income.

In addition, farmers, through FESTA, entered into partnership with large local agro-product chain-stores/merchandisers, i.e. e-Mart Mall, Lotte Mart Mall, eBay Korea, etc. The partnership obviously enabled the farmers to access the large distribution channel.

It is obvious that Korea does not possess comparative advantages in agriculture due to inherent constraints. However, the GOK is placing its efforts on the development of “competitive advantages” by building a competitive food processing industry through the convergence of science, technologies and agriculture in order to complement the innate weaknesses of Korea’s agricultural sector.

### 2.2. Improving market access and export

As discussed in the previous sections, the main focus of the public policies for the improvement of market access for rice as well as other agro-products was set on the innovation and reform of the distribution channel. The GOK continued to place public policy emphasis on the retrenchment of distribution costs. The establishment of public wholesale markets, as discussed previously, was the means of such endeavour.

In 2015, the GOK promulgated the Law of the Invigoration of Direct Transactions to Promote the Use of Regional Agro-Products. By doing so, the government laid on a legal foundation to promote direct transactions of agro-products between consumers and farmers. The promotion of direct transactions between farmers and consumers has become highly plausible due to the change in the technological environment—especially the advancement of ICT—and has strengthened the direct distribution/sale channel of agro-products. In addition to on-line stores, the government has rendered support to open direct sale stores, such as the “Local Food Market.”

### 2.3. Export promotion

The local food market refers to an off-line store where farmers are directly involved in the production, packaging, pricing, display and inventory of local products while a certain

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104 The concept of local foods is derived from Helen La Trobe (2002) Local food, future directions, Friends of the Earth, London: UK.

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### Table 12. Major Information Services Provided for the Rural Areas

<table>
<thead>
<tr>
<th>Information Service</th>
<th>Web Address</th>
<th>Main Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive portal for farms and fisheries</td>
<td><a href="http://www.welchon.com">http://www.welchon.com</a></td>
<td>This portal is run by the Korea Rural Community Corporation (KRC) servicing the information for would-be settlers in the rural areas, farm tour and eco-tour, farm management, extension services, etc.</td>
</tr>
<tr>
<td>Agro-food safety</td>
<td><a href="http://safeq.go.kr/">http://safeq.go.kr/</a></td>
<td>This portal supplies information on agro-product safety.</td>
</tr>
<tr>
<td>Comprehensive information services for livestock and poultry</td>
<td><a href="http://www.hqbrand.net">http://www.hqbrand.net</a></td>
<td>Promote and support outstanding livestock and poultry brands by linking them to consumers directly.</td>
</tr>
<tr>
<td>Agrix</td>
<td><a href="http://www.agrix.go.kr">http://www.agrix.go.kr</a></td>
<td>An informationised system for the entire procedures of the government support programmes from the application to the final account settlement.</td>
</tr>
<tr>
<td>Agriculture extension</td>
<td><a href="http://www.nongsaro.go.kr/">http://www.nongsaro.go.kr/</a></td>
<td>This portal is run and managed by the Rural Development Administration, rendering information on farming techniques and farm management as well as farm inputs.</td>
</tr>
<tr>
<td>Information portal for the distribution of agro-fisheries products</td>
<td><a href="https://www.kamis.or.kr/">https://www.kamis.or.kr/</a></td>
<td>This portal is run by the Korea Agro-Fisheries and Food Trade Corporation (aT) providing comprehensive information on the distribution channel.</td>
</tr>
<tr>
<td>An information system for the distribution of agro-fisheries products</td>
<td><a href="https://sugeup.or.kr/">https://sugeup.or.kr/</a></td>
<td>This portal is run and managed by the aT focusing on the supply and demand state of agro-fisheries products.</td>
</tr>
<tr>
<td>Food industry information system</td>
<td><a href="https://www.atfis.or.kr/">https://www.atfis.or.kr/</a></td>
<td>This portal services comprehensive information statistics on the agro-fisheries processing manufacturing industry as well as on restaurant sector.</td>
</tr>
<tr>
<td>Export information on agro-fisheries products and foods</td>
<td><a href="https://www.kati.net/">https://www.kati.net/</a></td>
<td>This web-site services comprehensive export market information, i.e. export-import statistics, customs, country info, non-trade barriers, regulations on food-additives, etc.</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation.

### Table 13. Revenue and Visitors to Invil Farmers’ Market FESTA

<table>
<thead>
<tr>
<th>No. of Visitors*</th>
<th>Spending per Visitor** (US$)</th>
<th>On-line Shoppers via INVIL***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Revenue*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>197,000</td>
<td>18,500</td>
</tr>
<tr>
<td>2007</td>
<td>339,000</td>
<td>24,957</td>
</tr>
<tr>
<td>2008</td>
<td>730,000</td>
<td>46,652</td>
</tr>
<tr>
<td>2009</td>
<td>437,000</td>
<td>11,800</td>
</tr>
<tr>
<td>2010</td>
<td>523,388</td>
<td>18,200</td>
</tr>
<tr>
<td>2011</td>
<td>798,935</td>
<td>27,800</td>
</tr>
<tr>
<td>2012</td>
<td>914,837</td>
<td>25,000</td>
</tr>
</tbody>
</table>

Notes: The exchange rate of KRW1,000 per US$ applied for the sake of convenience; * Total revenue and visitors of the 3-day farmers’ market; ** Total revenue/the number of visitors; *** Annual number of shoppers.


In 2015, the GOK promulgated the Law of the Invigoration of Direct Transactions to Promote the Use of Regional Agro-Products. By doing so, the government laid on a legal foundation to promote direct transactions of agro-products between consumers and farmers. The promotion of direct transactions between farmers and consumers has become highly plausible due to the change in the technological environment—especially the advancement of ICT—and has strengthened the direct distribution/sale channel of agro-products. In addition to on-line stores, the government has rendered support to open direct sale stores, such as the “Local Food Market.”

The local food market refers to an off-line store where farmers are directly involved in the production, packaging, pricing, display and inventory of local products while a certain...
amount of fees are deducted from the total sales. The benefits of the local food market include the lower price derived from the savings of distribution costs as well as the quality and freshness warranted by the minimum distance from the sourcing of the agro-products.

The setting-up of the local food market is confined only to agriculture co-operatives (primary co-ops), forestry co-ops, farmers association companies, agriculture corporations, social enterprises, regional governments and their agencies and public institutions. The MOARAF extends support on 30% of the costs for interior, equipment and facilities up to about US$300,000 and promotional materials (US$2,000 per store). There have been about 185 Local Food Markets that were established during 2012-2017. NH and the Livestock Co-operatives have opened 123 stores, while private sector agriculture corporations have set up 62.

Thus far, the adoption of the local food markets has seemed to be successful. The total sales generated from direct sales increased by 17.8% to US$1.61 billion in 2012 from US$1.36 billion in 2013. The strenuous growth of the agro-processing manufacturing industry had an important implication in Korea’s agro-exports.

In fact, the development of the global market has also become a means to improve market access for farmers. The URAoA brought forth not only a threat to Korea’s agriculture, but also an opportunity to the sector to expand overseas. In addition, the GOK entered free trade agreements (FTAs) with such countries as the ASEAN, Australia, Canada, Chile, China, Colombia, the EFTA, the EU, Peru, Singapore, India, New Zealand, Turkey, Vietnam, the USA. However, the critical challenge posed by these free trade institutions was that Korea’s agricultural sector had a comparative disadvantage vis-à-vis other parties in the institutions.

Korea’s deficits in the trade account for agro-products, on average, were about US$23.8 billion during 2008-2016. The export of agro-products was increased by 91.1% to US$8.59 billion in 2016 from US$4.5 billion in 2008. However, import has also increased at the same pace. The import of agro-products increased by 38.5% from US$24.9 billion in 2008 to US$34.5 billion in 2016. Import has by far exceeded export (Figure 30).

To narrow the trade gap, the export of agro-processing manufacturing products had to be increased, as it accounted for more than 75% of the agro-export, while raw agro-products totalled 12.6% and semi-finished food-products 12.2% (Table 14). As discussed earlier, the export of agro-processing manufacturing products

| Table 14. Agro-Exports by the Level of Process, 2000-2014 |
|----------|----------|----------|----------|----------|----------|----------|----------|------------------|
| Raw agro-Products | 445.7    | 448.2    | 543.6    | 625.9    | 716.5    | 720.2    | 698.1    | 682.7            | 700.3  |
| %        | 23.7     | 17.8     | 16.3     | 15.2     | 14.1     | 13.5     | 12.8     | 11.8             | 12.6   |
| Semi-finished | 211.1    | 186.2    | 296.4    | 392.7    | 543.1    | 566.4    | 738.6    | 718.1            | 674.4  |
| %        | 11.2     | 7.4      | 8.9      | 9.5      | 10.7     | 10.6     | 13.5     | 12.4             | 12.2   |
| Finished food products | 1,221.7  | 1,885.5  | 2,494.7  | 3,095.9  | 3,817.8  | 4,054.5  | 4,036.6  | 4,409.1         | 4,166.4|
| %        | 65       | 74.8     | 74.8     | 75.2     | 75.2     | 75.9     | 73.7     | 75.9             | 75.2   |
| Total Agro-Export | 1,878.4  | 2,519.9  | 3,336.8  | 4,114.6  | 5,077.4  | 5,341.1  | 5,472.3  | 5,809.9         | 5,541.10|

Note: Unit: US$ million.

106 The ASEAN, the Association of South-east Asian Nations, is a regional inter-governmental organisation comprising of the following member countries: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Thailand, Singapore and Vietnam. The EFTA, the European Free Trade Association, is a regional trade organisation and free trade area consisting of four member states—Iceland, Liechtenstein, Norway and Switzerland.
has demonstrated rapid growth. Interesting as it is, the top 10 agro-exports during 2015-2017 were represented by agro-processing manufacturing goods (Table 15).

For the GOK to increase the amount of agro-exports, it has set up support policies that can be encapsulated largely as (1) the overseas market development programme, (2) the promotion of the sale of agriculture and livestock products, and (3) the support programme for the procurement of excellent agro-food products.

• The overseas market development programme: This programme is managed and supervised by the Korea Agro-Fisheries and Food Trade Corporation (aT). The objectives are laid on the rural income increase and the development of food processing manufacturing industry through an increase of exports. This programme consists largely of the development of export growth drivers, including the development of export information infrastructure, the promotion of commodities with high export potential, support for export brands, the establishment of bases for the distribution and logistics, and the development of overseas buyers, comprising of support for participation to international food/agro-products exhibitions, the support on sales promotions and buyer invitation activities, etc. The government contributed 100% of the budget for this programme; it was, for example, total US$3.14 million in 2013—US$9.9 million for the development of export growth driver and US$21.5 million for the development of overseas buyers;

• The promotion of the sale of agriculture and livestock products: The objectives of this programme are set on raising the rural income and agro-exports. This programme is a 100% government subsidy managed and supervised by the aT. This programme consists largely of the subsidy on the export logistics costs and the enhancement projects for the building of export infrastructure. The total budget of US$41.2 million was set aside for 2013; and

• The support programme for the procurement of excellent agro-food products: this programme is designed to render support on the procurement costs of raw materials and the management expenses incurred by the process of agro-exports, whereby it renders the promotion of global competitiveness and the rural income increase. This programme is composed of 80%-government loans at an annual interest rate of 3-4% payable in a year; it is jointly managed and supervised by the aT and NH. NH manages and supervises the export production clusters while the aT manages and supervises agro-product export companies. The government budget for this programme in 2013 was approximately US$387.1 million.

The growth of the global food market has been extraordinary. It is forecast to grow at 1.9% annually during 2013-2020. It was a US$6.7-trillion market in 2013, US$6.3 trillion in 2015 and approximately US$7.7-trillion in 2017 and will grow to a US$7.7-trillion market in 2020.\(^{108}\)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Amount (US$ mill)</th>
<th>Commodity</th>
<th>Amount (US$ mill)</th>
<th>Commodity</th>
<th>Amount (US$ mill)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>2016</td>
<td>2017</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descending Order</td>
<td>Total</td>
<td>Total</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8,028.40</td>
<td>8,592.60</td>
<td>9,153.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Tobacco</td>
<td>886.8</td>
<td>Tobacco</td>
<td>981.6</td>
<td>Tobacco</td>
<td>1,125.60</td>
</tr>
<tr>
<td>2 Tuna</td>
<td>489.6</td>
<td>Tuna</td>
<td>575.8</td>
<td>Tuna</td>
<td>625.5</td>
</tr>
<tr>
<td>3 Dried sea-weed</td>
<td>304.9</td>
<td>Dried sea-weed</td>
<td>353</td>
<td>Dried sea-weed</td>
<td>513.2</td>
</tr>
<tr>
<td>4 Drinks</td>
<td>293.6</td>
<td>Drinks</td>
<td>334.4</td>
<td>Drinks</td>
<td>381</td>
</tr>
<tr>
<td>5 Processed coffee*</td>
<td>272.3</td>
<td>Ra-myeon**</td>
<td>259.1</td>
<td>Processed coffee*</td>
<td>272.4</td>
</tr>
<tr>
<td>6 Ra-myeon**</td>
<td>218.8</td>
<td>Processed coffee*</td>
<td>290.4</td>
<td>Sugar</td>
<td>168.3</td>
</tr>
<tr>
<td>7 Ginseng and its kinds</td>
<td>155.1</td>
<td>Sugar</td>
<td>167.3</td>
<td>Ginseng and its kinds</td>
<td>158.4</td>
</tr>
<tr>
<td>8 Sugar</td>
<td>151.4</td>
<td>Cookies</td>
<td>152.3</td>
<td>Cookies</td>
<td>123.7</td>
</tr>
<tr>
<td>9 Cookies</td>
<td>149.9</td>
<td>Ginseng and its kinds</td>
<td>133.5</td>
<td>Cookies</td>
<td></td>
</tr>
<tr>
<td>10 Glitter beer</td>
<td>119.3</td>
<td>Infant formula milk powder</td>
<td>121.5</td>
<td>Beer</td>
<td>112.4</td>
</tr>
</tbody>
</table>

Notes: * Processed coffee includes capsule coffee, extracted coffee, iced coffee cubes, etc.; ** Ra-myeon refers to instant noodle.


Compared to other global industries, the size of the food industry is, in terms of market size, by far larger than others. For example, the global food industry is about 4.7 times larger than the US$1.3 trillion global automobile market. It is about 6.9 times and 8.4 times larger than the global IT market, US$0.9 trillion, and the global steel and iron market, US$0.8 trillion, respectively. As such, the global food market will render an opportunity to any market participants to seize a growth driver in the decades to come.

2.3. The generation change: Encouraging business activities of small agro-firms

As of 2017, there are about 3.6 million small- and medium-sized businesses (SMEs) that are doing business in Korea. Of the total SMEs, only 1,278 firms, 0.036%, are registered as firms doing businesses in the agriculture, forestry and fisheries sector. The total number of employees working for the agriculture, forestry and fisheries SMEs is 14,292, or 0.0977%. These figures imply that the agriculture, forestry and fisheries sector as an industry in the SME sector is very shallow and highly fragile in spite of their importance in the socio-economic dimension of the nation.

In contrast, the number of agro-processing manufacturing SMEs was reported to be about 54,225, accounting for approximately 13.7% of the total manufacturing SMEs. These statistics suggest that the structure of the SME sector’s agro-value chain is exposed to a supply paucity in that the supply, or domestic production, of agro-products might not meet the quantity demanded by the burgeoning agro-manufacturing sector.

Since the late 1990s, the GOK set out to encourage the incorporation of corporate agriculture, consisting of agriculture/fisheries co-op companies and agriculture/fishery enterprises. It was a means to strengthen agriculture/fishery competitiveness by agglomerating small farmers/fishermen and pooling agricultural/fishery resources in their possession. As part of government support, the GOK extends various tax and financial benefits to corporate agriculture. The benefits consist largely of tax exemptions/reductions for an individual corporation and its members and the administrative (financial) benefits (Table 16). The government intervention and support were pertinent on the ground in that most of corporate agriculture, approximately 59.4%, were small businesses employing less than four persons.

<table>
<thead>
<tr>
<th>Type of Support</th>
<th>Exemption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate agriculture</td>
<td>• Exemption on corporate and education taxes: applicable on the whole amount of agricultural income and a portion of other income</td>
</tr>
<tr>
<td></td>
<td>• Exemption on value added tax (VAT): applicable to acquisition of such agro-inputs as pesticides, fertilisers, agro-machinery, etc.</td>
</tr>
<tr>
<td></td>
<td>• Exemption on stamp duty</td>
</tr>
<tr>
<td></td>
<td>• Exemption on acquisition, registration and property taxes</td>
</tr>
<tr>
<td></td>
<td>• Exemption on environment tax</td>
</tr>
<tr>
<td></td>
<td>• Reduction on land tax by imposing the tax on individual members (applicable to a co-op company)</td>
</tr>
<tr>
<td></td>
<td>• Aggregate land tax is applicable only to the land owned by the corporation.</td>
</tr>
<tr>
<td>Member (individual)</td>
<td>• Exemption on personal income and education taxes</td>
</tr>
<tr>
<td></td>
<td>• Exemption of income tax on the dividends incurred from agricultural income</td>
</tr>
<tr>
<td></td>
<td>• Exemption on capital gain tax: Applicable to the land invested</td>
</tr>
<tr>
<td></td>
<td>• Exemption on inheritance tax</td>
</tr>
<tr>
<td>Administrative support</td>
<td>• Financial support consists of grants and low interest loans from central and local governments</td>
</tr>
<tr>
<td></td>
<td>• Access to extension services offered by the RDA and NH</td>
</tr>
</tbody>
</table>


There was a positive indication that the number of corporate agriculture/fisheries consisting of agriculture/fishery co-op companies and agriculture companies was increasing. As of 2014, agriculture co-op firms accounted for about 66% of the total corporate agriculture, 11,599, while agriculture companies were 27.8%, 4,883, an increase of 7.5% and 29.9% from the preceding year respectively. Meanwhile, the fisheries co-op companies accounted for 5.7%, 1,004, whereas fishery companies were 0.6%, 99. It was an increase of 7.6% and 50.0% respectively.

106 Ibid.
108 The agro-processing manufacturing SMEs include food, drinks and tobacco manufacturing SMEs.
110 Agriculture/fishery co-op companies are incorporated as a co-op of 5 or more farmers or production groups jointly pursing agro-businesses of production, distribution, processing, exporting, etc. Agriculture companies are incorporated for agro-businesses.
By type of business activities, firms with production activities accounted for about 30.9% and 29.7% in 2013 and 2014 respectively. It is somewhat positive that the firms with the production activities increased by 8.2% or 338 in number (Table 17).

Table 17. Current State of Corporate Agriculture by Business Activities, 2013-2014

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>+/-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate agriculture in total</td>
<td>13,333</td>
<td>15,043</td>
<td>1,710</td>
</tr>
<tr>
<td>Production activities*</td>
<td>4,123</td>
<td>4,461</td>
<td>338</td>
</tr>
<tr>
<td>Other activities:</td>
<td>9,210</td>
<td>10,582</td>
<td>1,372</td>
</tr>
<tr>
<td>- Processing manufacturing</td>
<td>2,762</td>
<td>3,154</td>
<td>392</td>
</tr>
<tr>
<td>- Distribution</td>
<td>3,655</td>
<td>4,100</td>
<td>445</td>
</tr>
<tr>
<td>- Agriculture services**</td>
<td>851</td>
<td>942</td>
<td>91</td>
</tr>
<tr>
<td>- Others***</td>
<td>1,942</td>
<td>2,386</td>
<td>444</td>
</tr>
</tbody>
</table>

Notes: " Production activities include fresh produce and livestock; " Agriculture services include "entrusted farming."; " Other activities encompass restaurant, farm tour, eco-tour, etc.


While the GOK extends the support on corporate agriculture, the growth of agro-SMEs did not go unnoticed. The challenges of SMEs, in general, could be enumerated as (1) access to finance, (2) access to market, (3) access to human resources, (4) access to information, (5) access to technologies, and the like. The agro-SMEs were not an exception. Thus, government interventions were concentrated on these areas where the possibility of the market failure is high. For the improvement of SMEs’ access to finance, for example, the government adopted such tools as direct loans and investment, interest subsidy, credit guaranty and on-lending.

For the enhancement of SMEs’ access to technologies, the government contributed to the SME R&D fund worth about US$1.3 billion every year. The government received about 20%-30% of fees in the case of a successful development of commercialised technologies. The establishment of a double or triple helix model—a technical co-operation among SME-university and/or R&D institute, or SME-university/R&D institute, and the government—was encouraged and promoted.

For the expansion of SMEs’ access to market, the GOK has adopted a two-pronged approach to address the challenge. One was market development including the expansion of export; the other was the utilisation of the government procurement. For example, public procurement of SME products and services was estimated at approximately US$862 billion in 2018, which accounted for about 72.8% of the total public procurement.115

To help SMEs overcome the challenge arising from the shortfall in human resources, the central and local governments as well as other public agencies and institutions are implementing about 110 programmes including technical and vocational education and training programmes (TVET).

A similar trait to the distribution of SMEs was observed in the venture start-up sphere. The number of agro-venture start-ups accounted for the very least of the entire venture start-ups (Table 18). Facing the slow pace of growth of the agriculture and fishery sector, coupled with the population aging occurring in the rural areas, the lagging innovation and productivity, the GOK set out to encourage agro-venture businesses.

Table 18. Venture Start-Ups by Industry

<table>
<thead>
<tr>
<th>Type of Business</th>
<th>Number of Business</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>23,426</td>
<td>70.2</td>
</tr>
<tr>
<td>Data processing and software development</td>
<td>5,462</td>
<td>16.4</td>
</tr>
<tr>
<td>R&amp;D services</td>
<td>369</td>
<td>1.1</td>
</tr>
<tr>
<td>Construction</td>
<td>516</td>
<td>1.5</td>
</tr>
<tr>
<td>Wholesale and retail</td>
<td>685</td>
<td>2.1</td>
</tr>
<tr>
<td>Agriculture, forestry, fishery and mining</td>
<td>78</td>
<td>0.2</td>
</tr>
<tr>
<td>Others</td>
<td>2,824</td>
<td>8.5</td>
</tr>
<tr>
<td>Total</td>
<td>33,360</td>
<td>100</td>
</tr>
</tbody>
</table>


As a matter of fact, the contribution of agriculture, forestry and fishery to the nation’s GDP slid continuously from 9.27% of the GDP in 1987 to 4.52% in 1997, to 2.45% in 2007 and then to 1.96% in 2017. The number of persons employed by the agriculture, forestry and fishery industries fell rapidly from 701,000 in 2000 to 363,000 in 2007 and even further to 216,000 in 2014. It seems that the fast-paced growth of agriculture came to an end in the early 2000s.

Against this backdrop, the GOK promulgated the Law of the Special Measures for the Promotion of Venture Businesses of 2016 to promote innovative growth in all industries including agriculture, forestry and fishery. It also created a fund of funds to invest seed-money to SMEs and venture business funds created by the private sector. By doing so, the government provided a stable supply of credits needed for the “youth start-ups” and the matching funds for angel investors. The fund of the funds is managed by the Small Business Corporation, a policy intermediary of the Ministry of SMEs and Start-ups. Thus far, the fund has invested approximately US$100 million

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Venture funds invested a total of US$2.8 billion in 1,225 firms by the end of 2010. The SME fund-of-funds collected approximately US$181.4 million including the dividends of US$14.3 million. Crowdfunding was also encouraged as a tool to promote venture start-ups.

As stated thus far, the government adopted various policy tools to foster the promotion of small businesses. This is because the small businesses account for the largest proportion of the number of businesses in addition to the provision of employment opportunities. The same principles go with the agriculture, forestry and fishery industry. Although the industry has been reduced to a small size vis-à-vis others, this hardly means the importance of the industry has diminished at all.

3. The Continued Quest for the Agricultural Transformation

Has Korea achieved the agricultural transformation, as it has done with rice self-sufficiency? A candid answer to this question would be a simple no. This is because the agricultural transformation in Korea, as stated in the earlier chapter, is still an ongoing process. Although rice self-sufficiency was attained so that the rural areas have done away with hunger and poverty, new types of challenges repeatedly emerge, posing threats to agriculture and the people making livelihoods in it. Some challenges are structural, and others may be incidental. For example, one of the structural causes that was attributable to the diminishing role of agriculture in the national economy would be the sagging level of the rural area population. A critical change in the demographic trait in the rural area was that the level of aging population was on the rise. In contrast, the number of working age population was continuously declining (Figure 31).

The growing “income divide,” or income inequality, is another vexing challenge. Farm household income as a percentage of the urban household income has also been diminishing. The income of farm households once exceeded the urban household income, but this trend did not last long. In 2016, the farm household income as a percentage of urban household income declined to about 63.5% from 83.6% in 1999 (Figure 32). Although an increase in the absolute amount of farm household income has been observed, the income from farming has diminished, or has stagnated at best, while non-farming income has increased to complement the farm household income.

As defined by McKinsey and Company, “dynamics of an agricultural transformation start with increasing the income of rural households, higher productivity on farms, and greater demand in local markets. As the sector becomes more productive, larger markets are served, agro-processing expands, and some farmers decide to spend less time farming and take other jobs that offer

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better economic opportunities.” If it is so, the trait of the rural income in Korea may corroborate the criteria in the definition. Nevertheless, the structuralised income inequality between the rural and the urban areas amid rapid economic growth has caused a significant magnitude of out-migration of the rural youth, which has delivered nearly irrevocable damages on the demographic bases of the rural areas. The effect of the structural changes in demographic fabrics still lingers and threatens the sustainability of agriculture in Korea. Although the government has adopted the reverse migration programmes to induce the youth back to the rural areas by offering various incentive packages, it has yet been an uphill battle.

Furthermore, farmers face the challenges arising from climate change, creating the need for environment-friendly, or eco-friendly, farming techniques and associated technologies. They also have to fare in the convergence of science and agriculture; otherwise, they will not be able to survive from the severe competition arising from within and without the industry. The importance of these challenges is so crucial that the agricultural industry may be shaken to its roots if overlooked.

In short, the agricultural transformation in Korea is yet an unfinished task. Farmers will be able to see the achievement of the transformation when they attain the level of sustainable growth by successfully responding to these challenges, and when the capacity of agro-industries matures enough as to bring market participants a level of income that is stable and well aligned to national growth and beyond.

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V. IMPLICATIONS OF KOREA’S AGRICULTURAL VALUE CHAIN DEVELOPMENT TO AFRICA

1. The Applicability of the Korean Experiences to the Agro-Value Chain Development in Africa

Korea’s developmental path can perhaps be demarcated as the pre-rice self-sufficiency period and the post-rice self-sufficiency period. Since the attainment of rice self-sufficiency, the production inducement co-efficient of the agriculture industry ascended to 1.642 in 2000 from 1.399 in 1978 (Figure 33). During 1970-1978, the average production inducement co-efficient of agriculture grew moderately annually by 0.162% ascended at an average rate of 1.617% after the attainment of rice self-sufficiency (1978-1990). This trait is congruent to the high-growth period from 1985 and onward (see the shaded area in Figure 33).

In general, the production inducement co-efficient of agriculture was low vis-à-vis other industries (Table 19). One possible interpretation is that the effect of agriculture on the production of other industries was minimal, as foods—the main products of the agricultural industry—were directly consumed by consumers without having added value. However, after the attainment of rice self-sufficiency, from 1977 and onward, the agricultural production inducement effect rapidly increased, as the agro-products were integrated and combined with other goods and services and factored into the production activities of other industries via various production methods and linkages.

Although the establishment of a causal flow between agriculture and other sectors was not a focus of this study, i.e., whether the development of agriculture was preceded to other industries, it attempted to see, through a simple exercise, how agriculture affected to other industries after

Table 19. Change in Production Inducement Co-efficient: Selected Industries

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishery</td>
<td>1.386</td>
<td>1.393</td>
<td>1.399</td>
<td>1.476</td>
<td>1.557</td>
<td>1.596</td>
<td>1.58</td>
<td>1.642</td>
<td>1.504</td>
</tr>
<tr>
<td>Mining</td>
<td>1.371</td>
<td>1.44</td>
<td>1.441</td>
<td>1.555</td>
<td>1.672</td>
<td>1.581</td>
<td>1.542</td>
<td>1.588</td>
<td>1.524</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1.752</td>
<td>1.845</td>
<td>1.847</td>
<td>2.006</td>
<td>2.011</td>
<td>2.057</td>
<td>1.946</td>
<td>1.959</td>
<td>1.928</td>
</tr>
<tr>
<td>Construction</td>
<td>1.87</td>
<td>2.025</td>
<td>1.916</td>
<td>2.057</td>
<td>2.076</td>
<td>1.965</td>
<td>2.041</td>
<td>1.99</td>
<td>1.993</td>
</tr>
<tr>
<td>Restaurants and lodging*</td>
<td>1.301</td>
<td>1.377</td>
<td>1.431</td>
<td>1.645</td>
<td>1.659</td>
<td>1.685</td>
<td>1.726</td>
<td>1.978</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Notes: * It includes commerce, other services and personal services for the years 1970, 1980 and 1990. Source: Authors’ estimation based on the data from the BOK; some data were excerpted from the BOK as well.

118 The data to estimate the production inducement co-efficient of the agriculture industry, in fact, include those of the forestry and the fishery industries. Nevertheless, the production inducement co-efficient of agriculture, as a short form, will be used for the sake of convenience.
The employment inducement effect was approximately 0.591, higher than other industries in the sample (Table 20). Given the estimates were conducted after the rice self-sufficiency, it can be ascertained that the attainment of rice self-sufficiency may have made significant contributions to the employment and economic development in Korea.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Employment Inducement Co-efficient (Person/US$1,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishery</td>
<td>0.591</td>
</tr>
<tr>
<td>Mining</td>
<td>0.235</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>0.251</td>
</tr>
<tr>
<td>Construction</td>
<td>0.175</td>
</tr>
<tr>
<td>Restaurants and lodging</td>
<td>0.322</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation from the BOK (2018).

A plain but important implication can be drawn from the preceding discussions. That is, African countries would need more production of rice in order to develop robust value chains. In short, “Africa would need to produce more rice (staple grains); then, the agro-value chains would become vibrant.” This conversely means that vibrant value chains will not be possible without agricultural surplus. For example, Malawi’s agricultural commodity exchanges, i.e., Agricultural Commodity Exchange for Africa (ACE), AHL Commodities Exchange (AHCX) and Agricultural Development and Marketing Corporation (ADMAC), are not able to continue their business operations without implicit subsidies. This is because the trade volume is so low that they cannot make enough revenue to continue their operations.

Korea has achieved relative success in agricultural development, vigorously and effectively responding to the challenges of the time. To this end, public policies served as the guiding principles that laid the foundations for agricultural growth. In addition, all the stakeholders of the agro-value chain—the government, farmers, agricultural co-operatives, private-sector firms, and the like—forged strenuous partnerships to attain common objectives, especially rice self-sufficiency. The network of stakeholder partnership was built on a carefully designed system of institutions. Thus, Korea’s public policy experiences as well as institutionalised partnerships could be extrapolated or replicated to a certain degree by others who seek to grow their agricultural sector and agro-value chains.

To that effect, this study has thus far documented and catalogued Korea’s endeavours towards agricultural transformation, illustrating agriculture development policies and analysing relevant stakeholders and their roles in the development of rice value chains. Korea’s experiences in the attainment of rice self-sufficiency and agricultural transformation could serve as useful and beneficial references for agro-value chain development in Africa on the grounds that most of the SSA countries and Korea share common experiences in the initial conditions of agricultural development. That is, the agricultural sector was the staple industry in which majority of population had their livelihoods. In the absence of technology and capital required for economic development, agriculture in Africa and Korea was perhaps the only sector that served as a point of departure in the journey towards national development.

If juxtaposed, the current conditions and challenges that shaped Africa’s agro-value chains today and those of Korea’s in its early stage of development, despite a time difference of some 50 years, are almost analogous, if not the same. As stated, some commonalities could be identified in the initial conditions of agricultural development in both places, specifically, the dominance of small-holders, low productivity, the paucity of staple foods, low agricultural inputs, reliance on foreign aid, and the like. This observation suggests that Korea’s experiences of agricultural transformation and the agricultural value chain development, whether they were positive or not, could be shared with SSA countries as invaluable sources of reference on the path towards agricultural transformation and rice, or grain, self-sufficiency.

The current challenges that Africa faces along with Korea’s experiences accumulated during the rice self-sufficiency period arranged by the value chain activities can be epitomised as in the following table:

---

119 $X = AX + Y - M$ ................................. [1]

where $X$: total domestic product, $A$: input co-efficient matrix.

$A = [a_{ij}]$, $a_{ij} = x_{i}/X_i$

where, $a_{ij}$: proportion of production factor input from $i$ industry to $j$ industry;

$x_{i}$: amount of production factor input from $i$ industry to $j$ industry;

$AX$: intermediate demand;

$Y$: final demand;

$M$: amount of import.

From the equation [1] in above,

$X = (I - A^{-1})^{-1}(Y - M)$

$(I - A^{-1})$: the Leontief inverse matrix (the production inducement co-efficient)

120 Park Sung-jae (2018).

2. Role of the Bank in the Pursuit of Grain Self-Sufficiency and the Development of Agro-Value Chains

The African Development Bank Group, as a leading developmental institution that strives for social and economic progress of Regional Member Countries (RMCs) in Africa, has been placing outstanding efforts on the development of the agricultural and rural space. The Feed Africa Strategy, along with the pillars of other overarching strategies of the “High 5 Priorities,” is a manifestation of the AfDB’s determination to unleash the great potential of Africa’s agriculture.

To that extent, what then can the Bank do to support the RMCs in producing more staple grains, thus developing robust grain/agro-product value chains by factoring in Korea’s experiences? What specific contributions and assistance, based on the lessons drawn from Korea’s experiences, can it add to the RMCs’ efforts on the achievement of grain/rice self-sufficiency and the development of vibrant agro-value chains?

Table 21. Summary of Africa’s Challenges and Korea’s Experiences at the Time of the Attainment of Rice Self-Sufficiency

<table>
<thead>
<tr>
<th>Value Chain Tier</th>
<th>Africa’s Challenges and Constraints</th>
<th>Korea’s Experiences to Address the Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>• Constraints on access to agro-inputs, i.e., fertilisers, seeds (high-yield varieties), agro-machinery</td>
<td>• Fertilisers: Built fertiliser factories utilising foreign loans and grants, development assistance funds, and foreign investments. Expanded the supply of fertilisers based on credit-based sale and two-tier pricing</td>
</tr>
<tr>
<td></td>
<td>• The share of the use of improved seeds (as a percentage of food crop areas): 27% (in comparison, the share in Asia is approximately 82%)</td>
<td>• High-yielding seeds: The Green Revolution achieved by the introduction of Tong-il rice varieties</td>
</tr>
<tr>
<td></td>
<td>• Fertiliser input in Africa: About 1/8th of the world average</td>
<td>• Agro-machinery: Long-term, low-interest loans, joint-use of agro-machinery, the establishment of an after-sale-service network for the machinery</td>
</tr>
<tr>
<td>Extension services</td>
<td>• Traditional farming methods prevail (lack of modernised farming technics on soil improvement, pesticides, seedling, etc.)</td>
<td>• Systematic extension services rendered by NH, SMU, universities</td>
</tr>
<tr>
<td>Processing</td>
<td>• A large amount of post-harvest loss due to the lack of inadequate storage and processing facilities</td>
<td>• Minimised post-harvest loss and improved the quality of food crops by building RPCs</td>
</tr>
<tr>
<td></td>
<td>• Farmers are forced to sell their harvests immediately, thus at a low price, due to the lack of storage and processing facilities</td>
<td>• Yielded added value by establishment agro-processing complexes</td>
</tr>
<tr>
<td>Agro-product quality</td>
<td>• Consumer’s demand is not met due to the absence of agro-product quality control and management</td>
<td>• Met consumer’s demand by instituting quality control practices such as quality certification, i.e., GAP, product origin verification and agro-product standardisation</td>
</tr>
<tr>
<td></td>
<td>• Inadequate quality of local rice entails the domination of imported rice in local markets</td>
<td></td>
</tr>
<tr>
<td>Distribution</td>
<td>• Farmers are forced to sell their harvests immediately, thus at a low price, due to the lack of market access</td>
<td>• Modernised public wholesale markets were built, and an improved distribution channel was consulted by international development institutions, i.e., the World Bank, the UNDP, etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Improved distribution channel reduced transaction costs for farmers and consumers and linked suppliers and retailers directly</td>
</tr>
<tr>
<td>Wholesale</td>
<td>• Co-operatives exist but not robust</td>
<td>• NH, a multi-purpose co-op, led the agriculture development by providing credit programmes, co-op businesses (purchase and sale) and extension services.</td>
</tr>
<tr>
<td></td>
<td>• Most co-ops are single-purpose co-ops and small, thus lacking economies of scale even in co-op businesses</td>
<td></td>
</tr>
<tr>
<td>Agricultural co-operative</td>
<td>• Limited access to finance due to the rudimentary level of the agricultural financial system (lack of credit-lending, the collateral required, etc.)</td>
<td>• Long-term, low interest agriculture policy loans provided through the agriculture development fund</td>
</tr>
<tr>
<td></td>
<td>• The legal, institutional, programme infrastructures are there, but are not effectively implemented</td>
<td>• The fund was created by utilising development assistance loans rendered by the USAID, the ADB, and others</td>
</tr>
<tr>
<td>Cross-cutting issues</td>
<td></td>
<td>• NH mutual credit system was anchored and expanded in the rural areas</td>
</tr>
<tr>
<td>Agriculture finance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ compilation.
As indicated, grain self-sufficiency would not be possible without a clear understanding of the objective and the participation of all the stakeholders, public and the private. It is obvious that neither the government alone could achieve this noble objective, nor the farmers nor donor agencies. In the context of its investment operations in the RMCs, the Bank must establish a partnership of all the stakeholders and the grain value chain actors in the quest for the attainment of grain self-sufficiency and the development of agro-value chains (Figure 34). Such partnerships and their operationalisation must be explicitly described in the design of the investment operation.

3. Stakeholder Strategy

In the process of the pursuit of grain self-sufficiency and the development of value chains, the Bank perhaps needs to pay attention on the stakeholder strategy. The ultimate objective of the stakeholder strategy would be two-pronged. One is to muster, harmonise and integrate the participation of all the stakeholders for the pursuit of grain self-sufficiency and value chain development. The other aspect of the objective is to re-align institutions for the development of agro-value chains. To this end, the Bank may consider the building of "policy intermediaries" that serve as a policy/programme implementational arm, utilising Korea’s experiences with SMU and NH.

In all instances, the key to the successful development of value chains would be the active participation of all the stakeholders, especially the farmers and villagers. To encourage the farmers’ participation, to foster a spirit of self-help, and to do away with the tendency of dependency, SMU would be an effective tool to adopt. The United Nations Development Programme (UNDP) and the Organisation for Economic Co-operation and Development (OECD) have recognised the SMU initiative as a new rural area development model and a cornerstone for inclusiveness, sustainable growth, and empowerment in developing countries.

SMU is already anchored and localised well in Uganda where it was adopted by the government as their rural area development model. For example, three SMU Mutual Credits are currently in operation whose deposits were expanded to US$15,000 in 2015 from US$4,500 of donor’s seed-money rendered in 2007. The SMU mutual credits lend funds to members at an annual percentage rate (APR) of 12% while the local bank’s APR is 32%. SMU fared well in Uganda because its basic values, such as co-operation, were highly congruent to the traditional values of the rural areas in Uganda.

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Figure 34. Quadruple Helix Model of Partnership

Source: Park Young-ho (2018) Analyses on Africa’s Agriculture Value Chains and the Policy Proposal based on the Korea’s Agricultural Policy Experiences, in Korea, Seoul: KIEP.

The role of each stakeholder included in the quadruple helix model would be as follows:

1. **The Bank**: To co-ordinate and to encourage the participation of stakeholders in the partnership; to advise the RMC governments with detailed roadmaps, strategies, and action plans for the attainment of grain self-sufficiency and the development of vibrant agro-value chains;

2. **The RMC government**: To prepare roadmaps, strategies, and action plans for the achievement of grain self-sufficiency and the development of vibrant agro-value chains with the Bank and to provide implementation plans associated with the roadmaps and strategies prepared;

3. **The farmers**: To actively participate in the pursuit of the attainment of grain self-sufficiency and vibrant agro-supply chains; to have ownership of the tasks on the path of the attainment of grain self-sufficiency and agriculture transformation; and

4. **The consumers**: To be aware that they are one of the most important actors shaping the structure of the agro-value chains; to increase consumption of local foods in support of the rural areas.

---

Currently, SMU is being adopted and localised at the village, regional and national levels in such SSA countries as Burundi, Côte d’Ivoire, the Democratic Republic of Congo, Ethiopia, Ghana, Kenya, Madagascar, Senegal, South Africa, Rwanda, and Tanzania. Thus, it is recommended that the Bank establishes a partnership with the GOK’s Ministry of Interior and Safety, the line ministry of SMU, to expand and intensify SMU’s interventions in Africa.

In the public sphere, the Bank may help the RMC governments consider the establishment of a policy intermediary/ies to funnel government policies and strategies through to the village level. As stated, NH was such an intermediary in Korea’s instance. In fact, Africa already has had experiences of having vertically structured co-ops, which aligned with the government administrative system until the mid-1990s. Although they disappeared amid de-regulation and democratisation, the vertically structured co-ops at the time possessed strength and bargaining power. Now, the problems of the co-ops in Africa are that they are too diverse (too many and too small) and unstructured, thus being incapable of pushing for the greater benefits of all members, due to the lack of scale economies; after the withdrawal of the government, no support has been rendered to them at all.

As such, it is perhaps time to bring back the government to help forge a vertically structured agriculture co-op that also expands horizontally as to include financial and credit functions. Then, how would they operate? As the GOK extended fertiliser monopoly to NH for some period so that it could have revenues realised from the handling fees, the SSA governments could allow government-sponsored co-ops to be the fee-based agents of import and distribution of agro-inputs. In fact, the same revenue model of co-ops was once implemented in Cameroon. Indeed, “district cooperatives were the sole agents allowed to purchase export commodities and distribute agricultural inputs.” Although these co-ops disappeared because of inefficiency then, the model was largely supported by the UN and the ILO. Thus, it is worthwhile to carefully re-consider the promotion of vertically structured multi-purpose co-ops, à la NH, but with added resilience and flexibility.

To help the RMC governments devise strategies and action plans that fare well in current local realities, the Bank would need to establish strenuous public employee capacity building programmes.

So, as modus operandis, the following procedures are proposed:

1. Adopt SMU as a tool for greater social engineering:
   1-1) Enter a memorandum of understanding (MOU) with the GOK’s Ministry of Interior and Safety to increase and intensify the SMU adoption in Africa (specifically, to designate a pilot village/s of grain production);
   1-2) Monitor progress (monitored by the AfDB or AfDB designated institutions, i.e. renowned social developmental NGOs in Africa, etc.); and
   1-3) Scale up the extracted success factors of SMU by sharing them with the RMCs in the regions.
   1-4) Funding source (tentative): the GOK, the AfDB and other donors, RMCs and non-RMCs

2. Re-alignment of co-operatives:
   2-1) Conduct a feasibility study including the evaluation of the legal and regulatory frameworks as well as the identification of any challenges to the adoption of multi-purpose agricultural co-ops;
   2-2) Hold townhall meetings in/around hub-towns in rural areas with existing co-ops and elucidate the costs and benefits of a re-alignment;
   2-3) With the outcome of the study and the townhall meetings, co-ordinate with the host government on the changes or adjustments necessary, if any, in the legal and regulatory framework; and
   2-4) Continue to monitor progress and co-ordinate with the host government.
   2-5) Funding source (tentative): the AfDB and other donors, non-regional members of the Bank, ILO

The expected timeframe for the implementation of the aforementioned tasks for the next three years, based on the modus operandis, can be stylised as in Table 21 below.

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124 Jürgen Schwettmann (2014) p.3.

125 Ibid.
Table 22. Stylised Timeframe for the Implementation of the Expansion of SMU and Re-vamping Co-ops

<table>
<thead>
<tr>
<th>Title of Task / Modus Operandi</th>
<th>Y1</th>
<th>Y2</th>
<th>Y3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Adopt SMU</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Enter an MOU</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Monitor progress</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Scale-up process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2. Re-align co-op system</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Feasibility study</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Townhall meetings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Co-ordinate with host gov.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Monitor progress</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Disseminate new model</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Implications of Korea’s Major Policies and Programmes to the Development of Agro-Value Chain in Africa

As discussed thus far, the GOK and private sector actors have instituted numerous policies and appended programmes for agro-value chain development ranging from R&D and agricultural inputs to processing and distribution in an effort to respond to the environmental changes. The applicability of such policies and programmes to Africa in three developmental phases—the rice self-sufficiency period, the value addition period and the global competitiveness enhancement period—is stylised and presented in the tables that follow. In addition, the role of the stakeholders in the various tiers of the agro-value chain is also proposed.

4.1. The period of grain self-sufficiency

<table>
<thead>
<tr>
<th>Korea’s Experience of Policy / Programme Intervention</th>
<th>Shareability of the Experience with an SSA Country</th>
<th>Role of Stakeholders in Agro-Value Chain</th>
</tr>
</thead>
</table>
| • Forges a strenuous partnership of public and private sector | • The government assumes the role of the agricultural strategy- and policy-setting, while private sector actors serve as implementing agents that substantiated the strategies and policies in the field | • Bank:  
  - Help RMC governments to formulate partnerships with the private sector; and  
  - Urge the RMC private sector, i.e. NGOs, co-ops, farmers, to create partnerships with the government for the pursuit of common objectives including grain self-sufficiency  
• RMC government: Design a framework to aggregate private sector support for agricultural transformation and grain self-sufficiency  
• Private sector (i.e. farmers, co-ops, etc.): Support the government’s move towards agricultural transformation and grain self-sufficiency |
| • Devised clear and specific sectoral strategies, policies and action plans for policy/strategy implementation | • Provision of clear, actionable and attainable policies and strategies to serve as guiding principles towards common goals  
• But above all, consensus and agreement of all the stakeholders is a prerequisite for the successful implementation of strategies, policies and plans. | • Bank:  
  - Help RMCs to devise agriculture sectoral policies and appended action plans with specific, actionable and attainable objectives/targets; and  
  - Build a database containing genetic seed information on local grains, consisting of genetic and epidemic challenges that can be shared  
• RMC government:  
  - Revamp institutional structures to implement agricultural development policies and strategies including the review and provision of legal guides and budget plans;  
  - Ensure all stakeholders have a clear understanding of, and support, the national goals focused on agricultural development and transformation; and  
  - Invite all major stakeholders to participate in the process of the provision of strategies, policies and action plans in order to engage them in.
<table>
<thead>
<tr>
<th>Korea’s Experience of Policy / Programme Intervention</th>
<th>Shareability of the Experience with an SSA Country</th>
<th>Role of Stakeholders in Agro-Value Chain</th>
</tr>
</thead>
</table>
| • R&D                                               | • R&D is one of the most important functions in sustaining agricultural yields. | • **Bank**:  
  - Co-ordinate a co-operative framework for the intensification of R&D; and  
  - Build a database containing genetic seed information on local grains as well as genetic and epidemic challenges in real-time basis, which can be shared with potential partners (i.e., Africa Rice, the Korea-Africa Food & Agriculture Cooperation Initiative (KAFACI), universities around the world, etc.).  
  • **International institutions including Non-RMC member governments of the Bank**:  
    - Actively participate in the pooling of resources—knowledge, physical resources, etc.—by mobilising their agricultural/fisheries R&D arms; and  
    - Increase and intensify activities to house RMCs’ agriculture scientists for joint-research programmes.  
  • **Donor agencies and developmental partners**: Aggregate resources to focus on critical R&D issues in SSA.  
  • **RMC government**: Strengthen bi-lateral relationships with donor countries to share agri-science achievements among researchers. |
| • On-credit fertiliser programme                     | • Fertiliser programme based on grain-fertiliser swap rate | • **Bank**:  
  - Study the mechanisms of the programme (worth the Bank’s further probe on the programme as warehouse receipts today are a post-hoc measure; the program itself was implemented to resolve the input bottleneck that appeared in the onset of the farming/cultivation cycle).  
  • **Instituted a system of extension services based on a coaching system** | • Extension services are important in agro-productivity and dissemination of new agro-technics and technologies. | • **Bank**:  
  - Design an extension system based on the adoption of a new co-op model;  
  - Design a university-farmer co-operative network between agricultural universities and farmers locally, nationally, and regionally;  
  - Design systematic extension courses focused on the “training of the trainers programme,” in order to localise the programme; and  
  - Provide intense capacity enhancement programmes for government or quasi-government employees who are involved in extension services.  
  • **RMC government**:  
    - Co-operate with the Bank and revamp extension courses and institutional structure with Bank recommendations; and  
    - Assign a public agency to oversee extension services.  
  • **Donor agencies and developmental partners**:  
    - Aggregate resources to promote extension service programmes based on consultation with the Bank; and  
    - Increase capacity enhancement programmes for those public servants involved in extension services. |
| • Two-tier price policy for grains/fertilisers       | • Not recommended in the present time due to challenges in sustainability of the policy | • **Bank**:  
  - Consider a multi-purpose co-op model;  
  - Conduct a study on general strategies to aggregate small single-purpose co-ops in SSA; and  
  - Prepare capacity enhancement programmes for co-op members and farmers  
  • **RMC government**:  
    - In co-ordination with the Bank, prepare dialogues with existing co-ops and discuss the plausibility of a multi-purpose co-op model, including benefits and costs of adopting such a model; and  
    - Assure that a multi-purpose co-op would be independent of political influence.  
  • **Donor agencies and developmental partners**: In co-operation with the RMC government and the Bank, intensify capacity enhancement programmes for existing co-ops and farmers in the RMCs.  
  • **Existing co-ops and farmers**: Study the new (or revamped) co-op model and actively participate in dialogues with the government for the adoption of the new co-op model. |
| • Created NH (National Federation of Agricultural Co-op) | • The role of NH was invaluable in Korea’s agro-development;  
  • It needs to be noted that it was a multi-purpose co-op with a national apex;  
  • Good governance is key to consolidating the new co-op model. | • **Bank**:  
  - Conduct a study on general strategies to aggregate small single-purpose co-ops in SSA; and  
  - Prepare capacity enhancement programmes for co-op members and farmers  
  • **RMC government**:  
    - In co-ordination with the Bank, prepare dialogues with existing co-ops and discuss the plausibility of a multi-purpose co-op model, including benefits and costs of adopting such a model; and  
    - Assure that a multi-purpose co-op would be independent of political influence.  
  • **Donor agencies and developmental partners**: In co-operation with the RMC government and the Bank, intensify capacity enhancement programmes for existing co-ops and farmers in the RMCs.  
  • **Existing co-ops and farmers**: Study the new (or revamped) co-op model and actively participate in dialogues with the government for the adoption of the new co-op model. |
### Korea’s Experience of Policy / Programme Intervention

<table>
<thead>
<tr>
<th>Shareability of the Experience with an SSA Country</th>
<th>Role of Stakeholders in Agro-Value Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Created the Agriculture Policy Fund (APF)</td>
<td>• Bank:</td>
</tr>
<tr>
<td>• The APF helped to improve farmers’ access to finance</td>
<td>- Conduct a study on how to provide “seed money” for such a fund; and</td>
</tr>
<tr>
<td>• Korea’s APF was largely indebted to development partners at the time of the pursuance of rice self-sufficiency;</td>
<td>- Prepare a list of investors who are willing to invest in the APF so that financial resources can be pooled.</td>
</tr>
<tr>
<td>• The key to APF’s success is “clean and efficient” governance.</td>
<td>• RMC government: In co-ordination with the Bank, prepare to dialogue with developmental partners, particularly to present strategies for “clean and efficient” governance.</td>
</tr>
<tr>
<td>• Designated NH as the sole agent for the disbursement of the APF</td>
<td>• Donor agencies and developmental partners: Aggregate resources in order to create a funding pool for the APF.</td>
</tr>
<tr>
<td>• The NH was an outstanding field agent for the GOK in disbursing funds, particularly as it had banking and mutual credit arms.</td>
<td>• Existing co-ops and farmers: Actively participate in the dialogues with the government regarding access to finance and related issues.</td>
</tr>
<tr>
<td>• Designated NH as the sole agent for the purchase and distribution of fertilisers and pesticides</td>
<td>• Bank:</td>
</tr>
<tr>
<td>• It rendered a revenue model for the sustainability of the NH.</td>
<td>- Provide capacity enhancement programmes for those public employees who are involved in the APF disbursement programmes.</td>
</tr>
<tr>
<td>• A similar model was practiced in Cameroon before the period of the Structural Adjustment Programme (SAP).</td>
<td>• RMC government: In co-operation with the Bank, identify an agency that is most appropriate for being responsible for the APF programmes</td>
</tr>
<tr>
<td>• Bank: Conduct a study on the revenue model; and</td>
<td>- Set up measures to counteract corruption, favouritism, nepotism, and the like.</td>
</tr>
<tr>
<td>• RMC government: Set up institutional frameworks that ensure the operations are free from corruption and government influence</td>
<td>• Donor agencies and developmental partners: Provide capacity enhancement programmes for RMCs and collaborate with government agencies to ensure smoother distribution of funds through the APF.</td>
</tr>
<tr>
<td>• Donor agencies and developmental partners: In co-operation with the RMC government and the Bank, intensify capacity enhancement programmes for those involved in the scheme in the RMCs.</td>
<td></td>
</tr>
</tbody>
</table>

### 4.2. The period of value addition

<table>
<thead>
<tr>
<th>Shareability of the Experience with an SSA Country</th>
<th>Role of Stakeholders in Agro-Value Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Agricultural land re-arrangement and consolidation (ALRC)</td>
<td>• Bank:</td>
</tr>
<tr>
<td>• ALRC not only yielded productivity increase, farming efficiency and economic benefits, but also paved the way for agro-mechanisation;</td>
<td>- Help RMC government plan pre- and post-ALRC measures</td>
</tr>
<tr>
<td>• As most farmers in SSA are small-holders, the ALRC can be a conduit to raising productivity in SSA.</td>
<td>• RMC government: - Ensure all stakeholders have a clear understanding of the costs and benefits of the ALRC;</td>
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<td>• Bank: Conduct a study on the ALRC; and</td>
<td>- Review and prepare a legal and regulatory framework to support the ALRC, i.e. registration process, land co-op laws, tax incentives, etc.; and</td>
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<td>• RMC government: Set up institutional frameworks that ensure the operations are free from corruption and government influence</td>
<td>- Invite all the stakeholders in the devising of ALRC planning process.</td>
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<td>• Farmers: - Ensure that they understand all the ALRC plans and participate in the ALRC planning processes; and</td>
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<tr>
<td>• Form an ALRC co-op</td>
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<tr>
<td>Korea's Experience of Policy / Programme Intervention</td>
<td>Shareability of the Experience with an SSA Country</td>
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| • Agro-mechanisation                                | • Agro-machinery is applied to entire value chain activities, starting from production to marketing, in order to complement human or animal power. This contributes to minimising pre- and post-harvest loss while also increasing the quality of agro-products. Thus, the adoption of agro-machinery helps farmers in SSA not only increase potential yield but also improve the quality of their agro-products; | • Bank:  
- Help RMCs develop a plan for agro-mechanisation;  
- Identify those agro-machinery firms who want to invest in Africa; and  
- Conduct a study on how to avoid agro-machinery becoming “orphans.”  
• RMC government:  
- Scan their investment environment, including relevant laws and regulations, tax regime, etc., and determine whether they are investment-friendly as well as capable of garnering investment from agro-machinery manufacturers abroad;  
- Consider low or no tariffs for agro-machinery;  
- Start with small machinery and devise lease programmes, as it is more realistic; and  
- Expand technical and vocational education and training (TVET) programmes to encompass the maintenance and repair of agro-machinery  
• Donor agencies and developmental partners: Expand TVET programmes to encompass the repair and maintenance of agro-machinery |
|                                                    | • Implement ALRC before launching agro-mechanisation plans;  
• Some RMC governments tend to prefer large machinery such as tractors, but it would be more realistic to start with small and individualised machinery through a lease programme. Co-ops may be a good partner for this programme. | • Bank:  
- Help RMCs develop a plan for agro-mechanisation;  
- Identify those agro-machinery firms who want to invest in Africa; and  
- Conduct a study on how to avoid agro-machinery becoming “orphans.”  
• RMC government:  
- Study tax incentives that might be extended to RPCs;  
- Consider low or no tariffs for machines and equipment used by RPCs;  
- Consult with regional governments to provide land for RPCs; and  
- Expand TVET programmes to cover the maintenance and repair of machinery  
• Donor agencies and developmental partners:  
- Extend support to RMC governments technologically and financially to build in rice-producing areas; and  
- Expand TVET programmes to cover the maintenance and repair of machinery |
| • Rice processing complex (RPC)                     | • RPCs are highly recommended as they improve productivity and quality of rice as well as redress post-harvest loss. | • Bank:  
- Support RMC governments to develop a viable plan for agro-mechanisation;  
- Identify those agro-machinery firms around the world who want to invest in the agro-machinery sector in Africa; and  
- Conduct a study on how to avoid agro-machinery becoming “orphans.”  
• RMC government:  
- Study tax incentives that can be extended to RPCs;  
- Consider market access plans for agro-processing manufacturing goods, focusing on the opening of a government procurement market.  
• Donor agencies and developmental partners: Provide support for RMC governments technically and financially to establish agro-product manufacturing factories in rural areas.  
• Farmers: Be entrepreneurial to seek ways to add value to their agro-products at the village-level and propose them to the government. |
| • Development of the agro-processing manufacturing industry | • As agro-products are easily perishable and have no added value by themselves, it is necessary to add value by starting to develop an agro-processing manufacturing industry;  
• It would also pull the demand for rice once the industry reaches the industry growth stage;  
• It should be noted that the industry is necessary in those countries like Malawi where rice farmers do not consume rice but rather sell the rice and buy their staple food, maize. | • Bank:  
- Consider simple and effective agro-processing manufacturing processes, such as rice baby-formula and emergency food packages (rice porridge, etc.)  
• RMC government:  
- Study tax incentives that can be extended to the agro-processing manufacturing industry; and  
- Consider market access plans for agro-processing manufacturing goods, focusing on the opening of a government procurement market.  
• Donor agencies and developmental partners: Provide support for RMC governments technically and financially to establish agro-product manufacturing factories in rural areas.  
• Farmers: Be entrepreneurial to seek ways to add value to their agro-products at the village-level and propose them to the government. |
### 4.3. The period of global competitiveness enhancement

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<tr>
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<th>Shareability of the Experience with an SSA Country</th>
<th>Role of Stakeholders in Agro-Value Chain</th>
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<td>• Quality management of agro-products</td>
<td>• Quality management standards of agro-products would improve the quality of agro-products, so that they can inspire consumers with confidence and trust.</td>
<td>• Bank: Support RMC governments to establish quality management standards for agro-products.</td>
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</table>
| • Establishment of public wholesale markets           | • The revamping of the public wholesale market improved the efficiency and effectiveness of agro-products distribution channel; • The reduction of the tiers in the channel improves farmers’ market access and income by eliminating informal wholesale traders. | • RMC government:  
- Study the laws and regulations relevant to the establishment of a quality management scheme for agro-products; and  
- Design an institutional structure to implement and supervise the quality management scheme  
• Donor agencies and developmental partners: Support RMC governments in establishing quality management standards.  
• Farmers: Co-operate fully with the government and participate in the quality management scheme to bring farmers and consumers closer. |
| • Establishment of agro-industrial complex            | • Agro-industrial complex aims to increase farmer’s non-farm income in rural areas by adding value to agro-products; • Nevertheless, the complex has to carefully take into consideration the supply chain linkages, starting from the source of inputs to market access in urban areas. | • Bank: Support RMC governments in establishing an agro-industrial complex.  
• RMC government:  
- Study the laws and regulations relevant to the establishment of an agro-industrial complex;  
- Consider incentive packages to offer to firms investing in the complex; and  
- Scan the investment environment, including relevant laws and regulations, tax regime, etc., and see whether they are investment-friendly to accommodate foreign direct investment.  
• Donor agencies and developmental partners: Support RMC governments in establishing agro-industrial complexes. |
| • Improving information access                        | • By converging agriculture with leading-edge technologies such as ICT technologies as well as bio, nano, environmental, space and cultural technologies, the converged agriculture can anticipate the yield of high added value across the agro-value chain. | • Bank:  
- Link RMC governments with non-regional members of the Bank that possess advanced ICT for the improvement of information access; and  
- Review the feasibility of the establishment of mobile platform for agricultural activities  
• RMC government:  
- Solicit proposals for the design and establishment of a mobile platform for the dissemination of agriculture-related information; and  
- Establish infrastructure needs for converged agriculture  
• Donor agencies and developmental partners: Support RMC governments with the design and establishment of mobile platforms for the dissemination of agriculture-related information (weather, precipitation, agro-product prices, etc.) |
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<tr>
<td>• Establishment of local food market</td>
<td>• The establishment of a local food market brings farmers and consumers closer together; • (Refer to the re-alignment and revamp of the wholesale market in the preceding phase); • These value chain activities will pull a demand for local agro-products.</td>
<td>• Bank/RMC government: Enter into formal agreements with local chain stores and supermarkets to carry locally produced agro-products (i.e., People’s Trading Centre in Malawi) • Farmers: Standardise the quality of their products</td>
</tr>
<tr>
<td>• The establishment of a double or triple helix model</td>
<td>• Technical co-operation between SMEs, universities, and/or R&amp;D institutes as well as the government is encouraged and will enable farmers in SSA to not only increase potential yield but also improve the quality of their agro-products.</td>
<td>• Bank: - Encourage the RMC governments to establish SME-university co-operation (or SME-university-R&amp;D institute alliance) in order to enhance agro-SMEs’ competitiveness; and - Explore the potential of inviting those universities in non-regional member nations of the Bank to join the university-industry co-operation model. • RMC government: - Prioritise the university-industry co-operation model in bilateral co-operation with non-regional member countries of the Bank; and - Review the tax codes and render tax benefits such as tax exemptions for R&amp;D activities. • Farmers: Keep abreast of R&amp;D activities and communicate farmers’ needs to the government/other stakeholders</td>
</tr>
<tr>
<td>• The opening of a government procurement market</td>
<td>• The opening of a government procurement market will improve farmers’ access to market.</td>
<td>• Bank: Study the best cases of government procurement markets for agro-products and share the results with the RMCs. • RMC government: Explore the possibilities of government procurement for foods to supply to places such as schools, the armed forces, and the like. • Farmers: Standardise and assure the quality of products; pursue opportunities for greater access to market.</td>
</tr>
</tbody>
</table>
As is well known today, Korea has emerged from a poverty-stricken small agriculture-based economy some 60 years ago to become one of the global economic power-houses. Many argue that the origin of Korea’s successful industrialisation and economic transformation started from the transformation of the agricultural sector and attainment of rice self-sufficiency. Indeed, it was clear that the development of agriculture has rendered positive effects on other industries, especially since the time of the attainment of rice self-sufficiency. Although agricultural transformation is yet an on-going process, Korea has seen success in the development of its agriculture.

This study traces the success factors on the path of Korea’s agriculture development from a three-phased chronological perspective: the quest for rice self-sufficiency period (1962-1977), the post-rice self-sufficiency period (1978-1994) and the period of the enhancement of global competitiveness (1995-present).

It can be concluded that agriculture development, the attainment of rice self-sufficiency in particular, was an outcome of concerted efforts from all the stakeholders in the quest of a common goal. The government played a decisive role in designing and implementing detailed and meticulous strategies and policies; the private sector actors agreed to the objectives of the strategies and policies and helped translated them into action. Indeed, a strenuous partnership among the public and the private sector stakeholders made the achievement of the strategic objectives possible.

Given many developing countries aspire to achieve grain self-sufficiency and agricultural development today, could Korea’s experiences in food self-sufficiency and agricultural development serve as a source of reference for developing countries, especially, those with transitional economies in SSA? The answer is yes.

The current conditions and challenges that shape Africa’s agro-value chains today and those of Korea’s in its early stage of development, despite a time difference of some 50 years, share many commonalities. Some of these commonalities include the dominance of small-holders low productivity, the paucity of staple foods, low agricultural inputs, and reliance on foreign aid. Agriculture was the staple industry in Korea and a majority of population depended on it for their livelihoods; this is certainly similar to SSA countries today. These observations constitute the grounds that Korea’s experiences, whether positive or not, can be shared with SSA countries as a relevant and invaluable source of reference on their path towards agricultural transformation and grain self-sufficiency.

To re-iterate, Korea’s success in agricultural development and rice self-sufficiency was an outcome of the partnerships with all the stakeholders. This partnership was built on a carefully designed system of institutions, which served as the foundation of agricultural growth. To this end, public policies were established as those guiding principles that led the actors in the same direction. Given the high relevancy of Korea’s public policy experiences as well as institutionalised partnerships, many of these policies, strategies, and partnership models can be extrapolated or replicated to a certain degree by others.

A caveat needs to be noted at this point. Korea, due to the consequences of historical development, adopted a highly hierarchical government-led development model during the period of rice self-sufficiency. Thus, the extrapolation of Korea’s agricultural development experiences, particularly public policy experiences, must be carefully and selectively customised to be tailored to the realities of SSA’s transitional economies, for Africa today is much different from the past. Markets are liberalised, and political spaces are democratised amid the changes that arose from a mega-trend of de-regulation and democratisation that swept across Africa during the 1980s and the 1990s, especially, in the period of the Structural Adjustment Programmes (SAPs). It is evident that power has been dispersed to many, and state power, to the contrary, has been waning in the private sphere. This seems more conspicuous in rural spaces. Nevertheless, this study recommends that African governments need to increase their roles in rural spaces with a staunch political will to achieve grain self-sufficiency.

The aforementioned changes that have taken place in Africa suggest that the role of the African Development Bank, as a vanguard of Africa’s economic development and social progress, has to be enhanced. The Bank has ambitiously been pursuing agricultural development in Africa by adopting an approach to enhance agricultural value chains. The determination of the Bank was manifested in the Feed Africa strategy, which aims to unlock the potential of agriculture in Africa. And this study has
intended to provide assistance to such determined efforts of the Bank by cataloguing Korea’s experiences.

One of the conclusions that can be drawn from cataloguing Korea’s experiences is that Africa needs to produce more rice to develop robust value chain activities. In doing so, challenges and success can be applied to other grains and agricultural products delineated in the AfDB’s *Feed Africa Strategy* report. To this end, Korea’s success with increased rice production can offer useful policy references to the Bank. As the gravity of control of the agro-value chains shifted to the market in the post-rice self-sufficiency period, the concomitant policy changes can also be more relevant sources of reference that may well be in sync with the realities of Africa’s agriculture today.

Finally, this study proposes some action programmes and appended modus operandis, based on Korea’s experiences in the development of agro-value chains, as means to assist the Bank’s efforts in strengthening the agro-value chains in Africa. Although they have to be scrutinised for reality-checks to ascertain whether they are viable and plausible to Africa’s setting today, the unwavering basic principle that underlies these actions is partnership. To that end, the Bank is no doubt the most adequate and qualified stakeholder capable enough to yield meaningful outcomes in the quest for grain self-sufficiency and agricultural development of the regions. The Bank is in a position to play a pivotal role in the quest, owing to its work in accumulating remarkable experiences, in mustering disparate interests, and in successfully translating them to forge outstanding partnerships with various organisations, entities, and institutions for decades.


Kim Myeong-hwan, Yoo Nam-sik, Ahn Ki-ock and Lee Kye-im (1992) “A study on economic feasibility and

* For the format of the name of Korean authors appeared in this report, the surname is written first before the given name; The given name is hyphenated to distinguish from the surname, even though the hyphenation of the given name in Korea is not a convention.


MOAFRA, compiled by Korea Rural Economic Institute, KREI (1999) 50 Years of History of Korea’s Agricultural Policies, in Korean, Seoul: KREI.


** A name of the MOAFRA used in the past


Park Young-ho (2018) Analyses on Africa’s Agriculture Value Chains and the Policy Proposal based on the Korea’s Agricultural Policy Experiences, Seoul: KIEP.


(2016) A Guide for Agriculture Management:
Rice Management, in Korean, Jeonju City: RDA.


The Implications of Korea’s Experience for Developing Agriculture Value Chains in Africa