The Implications of Korea’s Experience for Developing Agriculture Value Chains in Africa
Details of the policies and recommendations outlined in this brief can be found in the full report published by the African Development Bank in February 2019.
Agriculture is the primary source of income for 60% of the African population. However, the value of agricultural output stands at only a quarter of Africa’s GDP whilst its net food import bill is expected to expand to $110 billion by 2025. Africa’s subdued agricultural growth is not only due to low productivity, where yields stand at 56% of the global average, but it can also be attributed to the limited development of, and linkages across the agricultural value chains, especially beyond the production stage. As a matter of fact, value addition, after farming only accounts for 38% of Africa’s agricultural value chain activities compared to that of the global average at 78%. This indicates that opportunities for increasing rural income remain unseized on many levels because the agricultural value chain remains underdeveloped.

Africa faces many challenges in the improvement of the agricultural value chain: lack of co-ordination between research institutions, lack of production facilities for inputs, underdevelopment of logistical infrastructure, fragmentation of market information, and poor market linkages, amongst others. Different African countries face different challenges according to the various internal and external conditions and systems, such as the types of cereals consumed, climate conditions, and level of market liberalisation. For example, a market for rice is developing in Senegal as players from the private sector, such as the Compagnie Agricole de Saint-Louis (CASL), are paving roads for large-scale production and market penetration. Senegal’s main challenge is improving the quality of rice so that it can be exported. On the other hand, Malawi is striving to create a market for rice as well as improve production of maize, its staple crop. It is also struggling to balance market liberalisation with government policies such as subsidies for purchasing fertilisers. Once a maize exporter, Malawi now imports much of the maize consumed and although the consumption of rice is increasing, market developments are yet inconspicuous.

Nevertheless, the need to improve agricultural production and distribution as well as securing the quality and safety of foods is of pressing importance across the continent, especially as the urban population increases rapidly leading to high demands for packaged and ready-made foods. As a response, the African Development Bank launched the Feed Africa initiative in 2015 as the second pillar of the five development priorities (the High-5s), which seeks to (1) lift 130 million people out of extreme poverty through job creation in rural areas, (2) eliminate hunger and malnutrition, (3) become a net food exporter by 2025, and (4) increase Africa’s share of the market value in processed commodities by 40%. Developing agricultural value chains is integral to meet these goals.

One interesting case that can be of reference to Africa’s agricultural aspirations is that of the Republic of Korea (hereinafter referred to as Korea), especially in the development of rice value chains. The conditions of several African countries today are similar to that of Korea’s in the 1960s when agricultural productivity was low. Subsistence farming was the main form of agriculture and Korea’s reliance on food imports and food aid was severe. After achieving rice self-sufficiency in the 1970s, rural incomes increased significantly and Korea now exports safe and quality assured agro-products and processed goods. Korea’s agricultural transformation and development is still an ongoing process as it faces increasing global competition, but the Korean government’s policies and strategic responses to many of its challenges present meaningful implications for Africa’s agricultural transformation and development of agricultural value chains.

After 30 years of Japanese colonisation and the Korean War that followed, Korea’s aggregate output and GDP per capita in 1961 was at $2.8 billion and $93, respectively. Food was short and dependency on imported food was extremely high; while Korea’s merchandise exports were at $87 million, food imports were 145% higher, at $126 million. Naturally, agriculture’s contribution to Korea’s GDP was more than 40% in the 1960s, prior to the de-
development of the manufacturing industry. Accordingly, the development of the agricultural sector was a national priority, in terms of both improving the livelihoods of the people and improving the government’s finances. However, as with the case of Africa today, Korea’s agricultural sector was dominated by smallholders with low productivity while agricultural infrastructure and finances for agricultural development were scarce, all while its population was quickly expanding.

To solve the food deficit, the Government of Korea (GoK) established rice self-sufficiency as an important strategic developmental objective in its first 5-year National Development Plan in 1962. The specific goals of the government were to increase cereal yields by 6.2% per year in order to achieve rice self-sufficiency by 1968 and begin exporting in 1969. The government structured its policies comprehensively so that the public, private, and civil sectors would all be involved and improved.

The most important breakthrough for achieving self-sufficiency came in 1964 when a new variety of rice named the Tong-il rice was developed by a group of Korean breeders. The Tong-il varieties yielded 30% more than that of the Japonica varieties which were generally being consumed at the time. Because the government was adamant on distributing the seeds swiftly, new seeds were multiplied under the supervision of the GoK in the Philippines to avoid Korea’s severe winter climate, which curtailed the average time of multiplication by 2 years. With the distribution of the Tong-il seeds in 1971, rice yields increased to 5.13 metric tonnes per hectare (MT/ha) in 1972 from 3.98 MT/ha in 1962. Total production of rice also increased from 3.2 million MT in 1968 to 6 million MT in 1977.

In conjunction with the development of the Tong-il varieties, the GoK established the Rural Development Administration (RDA) in 1962 to oversee the entire chain of R&D, coaching and extension. RDA’s coaches provided information on the agro-techniques for rice and cereal cultivation and also provided education for rural women and youth. The number of technical coaches within the RDA totalled 7,769 in 1974 where at the village levels, one coach was responsible for overseeing 7 villages (76ha of Tong-il rice paddies and 165ha of other paddies). The RDA’s role was critical in extending extension services for the Tong-il variety in the early stages of its dissemination as it faced resistance from farmers due to several shortcomings: larger requirements of input volumes, susceptibility low temperatures, and the short height of stems that made them unsuitable for firewood, fodder and the likes. However, the GoK was determined to prioritise quantity over quality to secure food security and thus, the RDA was put at the forefront of disseminating new techniques that strengthened productivity.

Two other institutions that emerged as critical players during this period were the National Agricultural Co-operative Federation (NACF or known also as “NH”) and the Saemaul Undong. The NACF was a multi-purpose cooperative that, although private in nature, functioned as a quasi-governmental institute as it was delegated the responsibilities of purchasing, distributing (through a two-tier system) and storing fertilisers, as well as harvesting crops on behalf of the government. It also had monopolistic authority over agricultural finance; the NACF managed the GoK’s Agriculture Development Fund, a special fund for rural development, and received handling fees and charges as well as tax benefits for its services. Through its financial functions, the NACF introduced mutual credits to cut down the rampant transactions of informal lending with exorbitant interest rates. As a commercial bank, the NACF was able to acquire credits from capital markets, which were then loaned to rural farmers at low interest rates. The use of informal lending declined significantly as a result, from 69% in 1971 to 37% in 1979. The NACF developed an entire chain of activities related to agricultural development, including production, extension, marketing, distribution, finance, and import-export, for the government’s operations. The Saemaul Undong, on the other hand, was a social movement initiated by the government for rural development. The movement emphasised the values of diligence, self-help and co-operation, and provided material incentives and compensation for the voluntary mobilisation of villagers. It ensured that all villagers, including women and youth, would be included in development efforts.

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7 World Bank Development Indicators; Rural Development Administration (2014).
8 The breeders had been dispatched by the GoK to the International Rice Research Institute in the Philippines because the government strongly emphasised research and development.
9 RDA and Northern Agriculture Research Institute (2012), p. 139.
11 A multi-purpose cooperative takes on all the roles of a single purpose cooperative such as marketing, purchasing, financing and insurance.
12 Hwang (2010).
Additionally, the GoK was resolute in supporting the domestic production of fertilisers and did so for several reasons. First, fertilisers were critical to improving productivity and addressing topographical challenges; mountainous terrains limited land available for residential and farming purposes, thus creating intensive farming structures. Second, the Tong-il varieties required heavier use of fertilisers, and third, fertiliser imports accelerated the deterioration of the government’s already limited foreign reserves. In the 1950s, fertilisers were being sourced entirely through foreign aid, amounting to 40% of all agricultural imports in the concessional loan account. The GoK established the first fertiliser factory in 1961 through a tied loan from the US Agency for International Development (USAID). Subsequently, eight fertiliser factories were built in the 1960s through domestic and foreign investment, USAID loans, and commercial loans. Korea’s self-sufficiency in fertilisers was achieved in 1975 when the total supply (901,000 MT) exceeded total demand (886,000 MT). The GoK indemnified the accruing deficits partially from the dividends received through its shares of Youngnam and Jinhae Chemical. However, the system was not sustainable as the government deficit grew as large as $2.6 billion and thus, the distribution system was liberalised in 1987. The government also supported the farmers’ purchase of fertilisers by enabling trade based on credit. Fertilisers were to be traded by cash in principle through a ‘grain-fertiliser swap rate’ set by the government’s Council of Ministers annually as guidance for accepting promissory notes stating the exchange of fertilisers for cereals in possession, or with expected harvests. The purchasing rate of fertilisers through credit was as high as 80% in 1961 but gradually decreased to 30% in the 1970s as rural incomes improved.

The government also controlled and determined the price of cereals, especially rice because rice, as a staple crop, had important political and economic significance. The government maintained a low-price policy throughout the 1950s and 1960s as part of its post-war reconstruction efforts. However, this discouraged farmers from producing surplus cereals and the terms of trade for agricultural products worsened considerably. Change came in the late 1960s when the government’s purchasing price for selected key cereals were set higher than the inflation price. The GoK adopted a two-tier price policy for rice and barley in the 1970s, purchasing rice (Tong-il varieties only) and barley at a higher price than the farm gate price and selling them at a lower than purchasing price to urban markets. As a result of the policy, food prices stabilised in urban areas, farmers gained greater market access, and production levels, especially that of the Tong-il rice, increased greatly, leading to an increase of rural household incomes (Figure 1); rural income growth was around 14.6% between 1960 and 1969 while urban income growth was 3.5%. However, this inevitably led to government budget deficits, which the GoK reclaimed through long-term loans from the Bank of Korea. Consequently, the increased supply of money caused negative impacts, such as inflation, on the Korean economy.

Table 1. Fertiliser factories established in the 1960s

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Type</th>
<th>Funding Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>Chungju Fertiliser</td>
<td>Urea</td>
<td>USAID loan</td>
</tr>
<tr>
<td>1963</td>
<td>Honam Fertiliser</td>
<td>Urea</td>
<td>Domestic investment, foreign loan</td>
</tr>
<tr>
<td></td>
<td>Chosun Fertiliser</td>
<td>Composite</td>
<td></td>
</tr>
<tr>
<td>1966</td>
<td>Gyanggi Chemical</td>
<td>Fused phosphate</td>
<td>Domestic and foreign investment</td>
</tr>
<tr>
<td>1967</td>
<td>Youngnam Chemical</td>
<td>Urea, Composite</td>
<td>Domestic investment, USAID loan</td>
</tr>
<tr>
<td></td>
<td>Jinhae Chemical</td>
<td>Urea, Composite</td>
<td>Gulf oil, USAID loan</td>
</tr>
<tr>
<td></td>
<td>Hankook Fertiliser</td>
<td>Urea</td>
<td>Commercial loan</td>
</tr>
<tr>
<td></td>
<td>Poongnoeng Fertiliser</td>
<td>Fused phosphate</td>
<td>Japanese investment</td>
</tr>
<tr>
<td>1968</td>
<td>Chosun Fertiliser</td>
<td>Composite</td>
<td></td>
</tr>
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Fertilisers were subsidised and distributed to farmers through a two-tier price system: the NACF would purchase fertilisers from the manufacturers through govern-

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15 The NACF was delegated by the government as the only distribution channel for fertilisers.
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The gist of the government’s policies shifted to increasing cost-efficiency and quality after rice self-sufficiency was achieved, as incomes increased, and consumers were willing to pay for better quality products. The attainment of rice self-sufficiency and surplus production as a result provided a turning point for government policies as it was able to place more emphasis on developing the post-production value chain and improving the physical and institutional infrastructure for agricultural development.

To maximise efficiency of the limited land space due to the topography of Korea as previously mentioned, the government expanded the Agricultural Land Rearrangement and Consolidation (ALRC) plan to a national level. The central and local governments paid for 80% of the necessary expenses for the re-arrangement and consolidation of land, improvement of roads and irrigation systems as well as land swaps and title registration. ALRC led to increases in production and efficiency and also paved the way for the utilisation of agro-machinery.

The GoK introduced the 5-Year Plan for Agro-mechanisation in 1972 which targeted the domestic production and distribution of 100,000 small-sized agro-machinery through which, companies like Daedong Industrial could grow. The government provided farmers with long-term, low-interest loans to purchase agro-machinery. The second 5-Year Plan that commenced in 1977 focused on the supply of large agro-machineries. The NACF had exclusive rights in the distribution of agro-machinery that was subsidised by the government. They also provided tax-exempt fuel for agricultural machinery. Continued government support through the third and fourth 5-Year plans led to 90% agro-mechanisation rates for rice in the early 1990s, which relieved the burden of labour shortage that the rural areas were facing due to rapid urban migration.

To improve the quality of rice, the GoK introduced Rice Processing Centres (RPCs) and Drying and Storage Complexes (DSCs) in the 1990s. RPCs are systemic complexes where all post-harvest activities such as weighing, drying, storage, processing, and packaging take place whilst DSCs are more focused on the drying and storing.

functions. The central and local governments supported around 60% of construction costs for RPCs primarily set up by the NACF. The use of computerised systems in the RPCs and the creation of linkages in forward and backward activities cut processing costs by 34% and labour input by 64% whilst the loss rate declined from 6% to 1%.

The government also instituted schemes such as Good Agricultural Practices (GAP), Agricultural Product Origin Verification, and Agro-Product Standardisation to enhance quality. GAP strengthened accountability by disclosing to the customers all information related to the production and management of products. Products had to pass a rigorous set of standards to receive GAP certification. The Product Origin Verification scheme was adopted to prevent the disguise of cheap foreign products as local products. The government also instituted the Agro-Product Standardisation scheme to uplift declining consumer confidence in local agricultural products because quality standards had not been established. Grading standards based on the quality, size, end-use, and packaging were established through the Agro-Product Standardisation scheme.

One of the most significant policy shifts in the post-green revolution era was the overhaul of the agro-product wholesale network. As with Africa, Korea’s distribution channel length was around 6 to 7 tiers, among which the middlemen were the dominant influencers of prices. Transaction costs were high as many actors were involved and also because smallholder farmers were trading in small volumes. The government reformed the wholesale market, originally dominated by informal wholesale markets, to minimise the length and cost of the transaction and strengthen transparency. The government built 33 public wholesale markets in major cities around the country, which implemented fixed prices to minimise price volatility and an auction system to assure transparency. Subsequently, the channel length was cut to 4 to 5 tiers while transactions through informal markets were also reduced from 51% in 1982 to 19% in 2010. It also decreased the risk of non-payment by balancing accounts daily.

As for agricultural finance, the government introduced the Law of Credit Guaranty for Farmers and Fishermen in 1971 to provide access to loans for those farmers and fishermen who had no means of security or collateral of co-signers to obtain funding. The government also promulgated the Law of Agricultural Land for Collateral in 1966 so that land could be used as collateral, although only for NH loans.

Enhancing Global Competitiveness (1995–)

With obligations under the Uruguay Round Agreement on Agriculture, Korea has been facing various external challenges since the mid-1990s as well as structural challenges that arose from the decreasing consumption of rice, and in turn, the decrease of rural income. In fact, the annual per capita consumption of rice declined significantly from 132.4kg in 1980 to 62.9kg in 2010. As a result, the government realised the need to create incomes across the rice value chain as well as to diversify agricultural production.

Furthermore, new opportunities emerged with urbanisation as the urban population sought quicker and easier ways to consume food. The need to deliver fresh food to urban consumers all year round led to the development of the ‘white revolution’ where farmers used vinyl greenhouses to extend growing seasons. The GoK designated vinyl greenhouse horticulture as a strategic sector for agricultural growth, which became an important source of income for farmers. The use of cold chains, weather control systems, and other technologies greatly improved the quality of fresh produce, making the sector ready for global competition. The export value of fresh products rose from $7.7 million in 1992 to $237.2 million in 2015.

Urbanisation and the decreasing size of households triggered the development of the home meal replacement (HMR) market through which sales of pre-cooked rice increased 733% between 2008-2014. The HMR market itself grew at an annual rate of 14.5% since 2010. Processing rice for value addition was legalised by the government after rice self-sufficiency was achieved in 1980 and supported through the Law of the Promotion of Rice Processing Manufacturing Industry and the Use of Rice in 2011. Consequently, a $20 bag of 10kg of rice could be sold as distilled liquor after processing at $190.

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20 Korea Statistical Information Services (accessed 2 September 2018).
22 Rice cooked and packed in polypropylene packages that can be consumed after heating in the microwave.
25 MOAFRA (2008), p. 3.
Distribution channels also changed with the demographic shift as families consisted of smaller units and single-person households increased. The growth of convenience stores led to the development of smaller packaging units. Increased access to the internet and mobile devices led to the development of on-line shopping channels.

The GoK has also been actively promoting the engagement of small and medium-sized businesses in the agriculture sector. The GoK encouraged corporate agriculture to increase competitiveness by agglomerating small farmers with co-op companies and enterprises. The government provided various tax exemptions and administrative support to corporate agriculture. The government also provided $1.3 billion annually to agro-SMEs for R&D purposes; farmers would partner with universities and research institutions to develop and utilise technologies for farming. Public procurement was an important tool for expanding SMEs’ access to markets. The ratio of agro-product procurement amounted to 72.8% of the total public procurement in 2018.\(^{26}\)

Despite various efforts by the government, improving the trade account for agro-products, among others, remains a challenge for Korea. Although the export value has increased from $4.5 billion in 2008 to $8.6 billion in 2016, import value is by far larger at $34.5 billion.\(^{27}\) The growing income divide is another vexing challenge. Although rural income once exceeded urban income, farm household income compared to urban income is now at 63.5%.\(^{28}\) Climate change is another rising issue that threatens the agricultural sector.

More recently, the GoK has utilised ICT for farming. For example, the ‘smart greenhouse’ controls temperature, moisture and carbon dioxide levels via sensory devices that lead to increases in yield. The GoK also introduced the Information Network Village (INVIL) to address the communication gap between consumers and farmers. It accommodates the direct sales of farm products, encourages farm tours and eco-tourism, and acts as a gateway for farmers to enter partnerships with large distributors.

In addition to online trade, the government supported the development of ‘local food markets’ where farmers are involved in the processing, marketing, and retail of local products. Around 185 local markets have been established between 2012 and 2017, and total sales from direct trade have continued to increase.

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\(^{26}\) Ministry of SMEs and Startups (2018), p. 31.

\(^{27}\) KOSIS Database (accessed 2 September 2018).

\(^{28}\) Ibid.

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Figure 3. Change in household structure, 1970-2017

(source: Authors’ compilation of the data obtained from KOSIS (accessed 2 September, 2018).)

Figure 4. Growth rate of various off-line distribution channels

(source: Authors’ re-arrangement of NH (2016) p. 54.)
The development of agricultural value chains in Africa: What lessons can be drawn from the experience of Korea?

Most of Korea’s past policies provide guidelines as to which policies worked well and might be most effective in the various circumstances of African countries. For example, the NACF might be applicable for adaptation as it was a critical agent in forming the rice value chain across various dimensions, such as finance, distribution, extension, education, etc.

Another important area to consider in Korea’s agricultural transformation is that the agricultural production inducement effect increased rapidly after the attainment of rice self-sufficiency in 1977. The surplus production of rice led to the integration of agro-products with other goods and services, creating stronger links across the value chains. The similarities between Korea’s early stages of agricultural development and that of Africa today indicate that creating surplus production of agro-products is important in triggering the robust development of agro-value chains. However, it must be noted that surplus production itself does not imply sufficient conditions for the growth of a value chain. Korea’s urban population was able to consume the surplus production as a result of industrial growth and through the artificial suppression of food inflation by the government. The circumstances under which Korea’s early agricultural development was possible were quite different from that of Africa today; the post-IMF led structural adjustment market regulations and political systems offer a different setting. Therefore, a contextual interpretation and application is needed.

Although Korea adopted a government-led development model, the development of agricultural value chains was the result of concerted efforts from all stakeholders in the public and private sectors; the government played a decisive role in designing and implementing detailed and meticulous strategies and policies, while the private sector actors supported the translation of such strategies and policies into action. Securing healthy partnerships between all stakeholders of a carefully designed system of institutions can serve as Africa’s foundation for agricultural growth.

In this sense, the role of the African Development Bank is especially important in unleashing Africa’s agricultural growth potential through a stakeholder strategy. The AfDB has already identified the key challenges facing agriculture in Africa through the Feed Africa Strategy. To overcome those challenges, the AfDB should coordinate the participation of regional member country (RMC) governments and the private sector, to create links between policies and the market. The AfDB also has financial functions that could be utilised to build policy intermediaries, similar to the NACF and the Saemaul Undong, which can serve as arms of implementation. These institutions would help the AfDB and RMCs approach rural communities more effectively if they are structured to align with the administrative divisions of the different countries.

As mentioned, Korea’s experiences have to be adjusted to the economic conditions and systems in which Africa is currently engaged in, and thus, there are some policies that are not recommended for adoption, such as the two-tier price policy. However, the key to the successful adaptation of policies is that the underlying principle for Korea’s agricultural value chain development was the partnerships among various stakeholders. To this end, the Bank is no doubt the most adequate and qualified actor to design effective policies and to foster cooperation among stakeholders in Africa’s quest for grain self-sufficiency and agricultural development.
References


Rural Development Administration (RDA) and Northern Agriculture Research Institute, Inc. 2013. Policy for Promotion of Agricultural Mechanisation and Technology Development, in Korean. Seoul: Ministry of Strategy and Finance.
