

Knowledge Exchange Sector Guidebook: Agriculture

**WORLD BANK GROUP
KOREA GREEN GROWTH TRUST FUND**



ABOUT THIS BOOKLET

This booklet serves as a companion to help you explore green growth in Korea's agriculture sector. It provides relevant information and a directory for reference, guidance and comprehension. Inside you will find details of past experiences that have shaped the sector, as well as recent green growth practices and the frameworks and government institutions that support Korea's advanced agriculture sector.

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PART 1



What is a Technical Knowledge Exchange

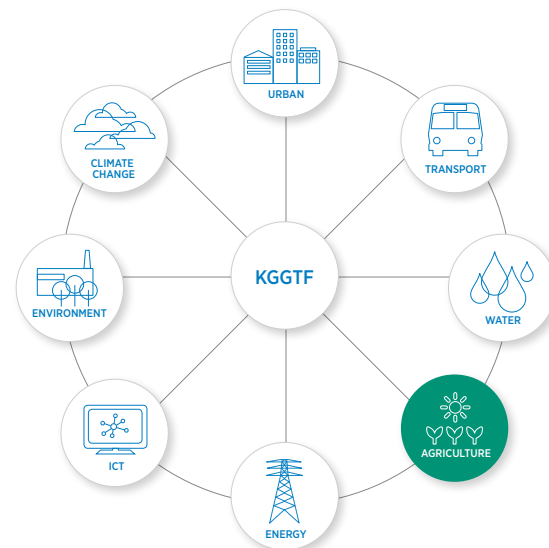
And What You Will Experience?

TECHNICAL KNOWLEDGE EXCHANGE

The KGGTF Technical Knowledge Exchange is where ideas, strategy and action come together. Facilitating the sharing of green growth best practice and technical expertise through on-site learning is part of what makes the Korea Green Growth Trust Fund unique.

This week brings together leading experts from the fields of: urban, transportation, environment and energy, agriculture, water and air. Their technical expertise includes everything from recent technological advances in smart grids, to monitoring and analysis, ICT integration, smart-card deployment to effective policy incentives and governance best practices and to facilitate wide-stakeholder engagement and support green economic growth policy and investment.

You will meet with key government ministries, institutes, multi-lateral organizations and companies relevant to your field. Site visits will provide a unique opportunity to see green growth in action first-hand, and to ask country specific and technical questions.



Sector Integration and Multiple Wins

KGGTF is passionate about tackling infrastructure challenges with integrated Green Growth approaches and methodologies. We seek to support countries in their sustainable growth strategies and investments by promoting collaboration across multiple sectors, and when appropriate, multiple scales, to create a multiplier effect that positively impacts quality of life.

“The exchange itself was very insightful and carefully planned and directly relevant to our work program. We learnt a lot from Korean experience and hope to bring good lessons learned from there to India.”

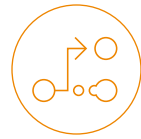
SURBHI GOYAL, WORLD BANK

During This Knowledge Exchange You Will Experience:



POLICY IDEAS

- In depth learning with policy makers and industry experts.
- Discussion on financial and policy incentives for innovative partnerships.
- Innovative governance structures that support transparency and interdepartmental collaboration.
- Policy development and coordination with municipal and central government, public institutions, private sector and local communities.



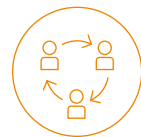
IMPLEMENTATION STRATEGIES

- Policy safeguards to ensure project funding withstands changes in political party and priority shifts.
- New frameworks for decision-making and problem solving.
- Strategy sessions on financial and technical solutions.
- Role of technical and policy think-tanks in policy setting and technical dissemination.



CAPACITY BUILDING

- Behind-the-scenes infrastructure site tours led by technical specialist.
- Learn how to avoid common and costly mistakes.
- Discover how synergies between the government, business and academia can speed the implementation of large projects.



GREEN GROWTH COMMUNITY

- Develop a network of key thought leaders working on innovative projects.
- A network of key thought leaders working on innovative green growth projects.

Be prepared to explore, ask questions and engage with leaders changing the world.



What We Do

The Korea Green Growth Trust Fund is a partnership between the World Bank Group and the Republic of Korea, established in 2011 to support client countries as they shift to green development path. Both partners share a common goal to reduce poverty and promote shared economic prosperity in an environmentally responsible and socially inclusive way.

KGGTF AT A GLANCE

\$138
MILLION FUND

144
GRANTS TO DATE

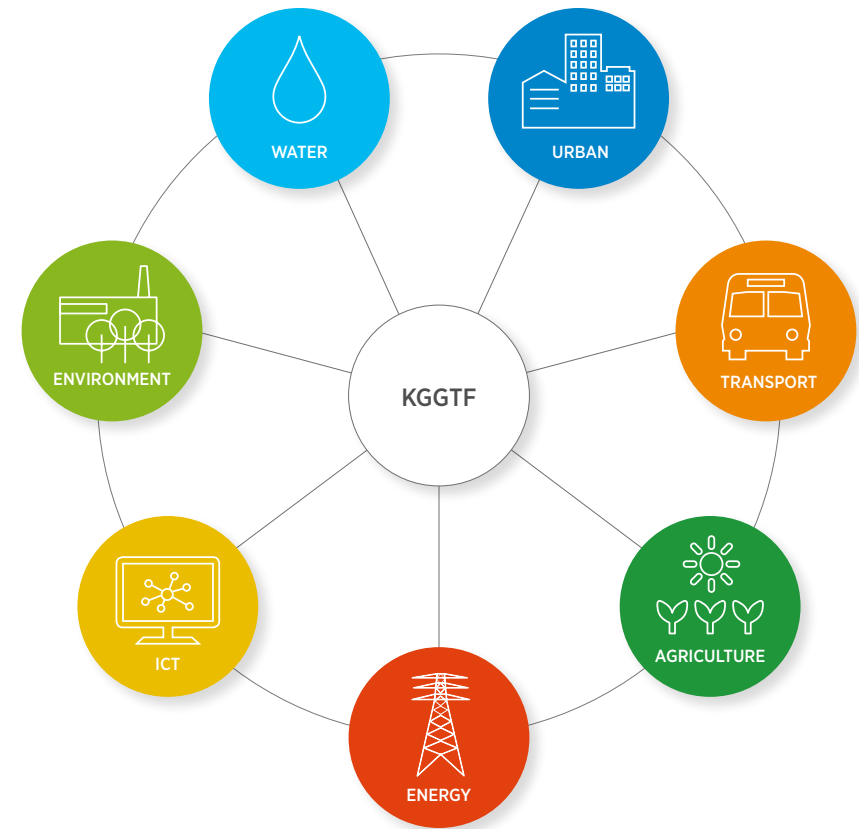
THROUGH 2026

SECTORS



The Trust Fund finances on-the-ground programs as well as knowledge exchange activities, and to date has approved 144 programs in the urban, transport, digital development, energy, environment, water, climate and agriculture

sectors. Based on strong performance, as well as increasing demand for collaborative development implementation programs, the fund has grown from US\$40 million to US\$138 million WBG programs through 2026.



The trust fund facilitates green growth programs across the urban, transport, digital development, energy, environment, water and agriculture sectors. Many of its programs are multi-sector, integrating two or more sectors at both the planning and implementation stages. This provides opportunities that allow for cost savings, data collection, citizen engagement and new forms of transparency and governance.

Knowledge sharing and network building are an integral part of green growth implementation. Facilitating the sharing of green growth best practice and technical expertise through on-site learning, and through the development of practical learning tools is part of what makes the Korea Green Growth Trust Fund unique.

Fund, manage, coordinate and monitor WBG KGGTF funded programs.

Aggregate, facilitate, and leverage Green Growth knowledge and learning.

Institutionalize global knowledge sharing to promote sustainable economic development.

PART 2

Why Korea?

Impact of War ¹

CIVILIAN CASUALTIES

Around 1 million people

DAMAGED INDUSTRIAL BUILDINGS

44%

of the total industrial buildings
(as of August 1951)

DAMAGED ELECTRICITY GENERATION CAPACITY

80% of the capacity

DEVASTATED SCHOOLS

4,800 schools

GROSS NATIONAL INCOME PER CAPITA (1953) ²

US \$67

GROSS DOMESTIC PRODUCT ²

US \$1.35 billion



South Korea's remarkable recovery from war and poverty provides case studies with specific solutions for economic advancement, creation of employment opportunities, and sustainable infrastructure development that is highly relevant for any country planning to transform or rebuild its economy.



Currently

RANKING ³

12th

largest economy
in the world

GROSS NATIONAL INCOME PER CAPITA (2018) ²

US \$33,564

GROSS DOMESTIC PRODUCT (2018) ²

US \$1.7 trillion

Source: Global Knowledge Exchange and Development Center (GKEDC), 2019

1953-1960

Post-war Korea faced varieties of hardships and challenges — a weak industrial base, dearth of natural resources, increasing population, and political instability. Foreign aid began to dwindle while poverty remained widespread.

1961-1979

The government embarked on an ambitious industrialization program as embodied in a series of Five-Year Economic Development Plans. The program relied on exchange rate reform, export subsidies, investment in economic infrastructure, expansion of schooling and training, and selective choice of strategic industries in later years.

1980-1996

Inflation and overcapacity created by the state-led industrialization in the 1970s were gradually resolved with stabilization policies in the early 1980s. The government pursued conservative fiscal and monetary policies to stabilize prices and rationalize the overly expanded industries. Economic liberalization gained speed in the 1990s.

1997-PRESENT

An extensive restructuring in the wake of the Asian financial crisis enabled Korea to avoid sovereign default, overhaul institutions and practices in its economy, and grow into one of the world's richest countries. Various efforts are now being made to meet the new challenges in the 21st century.

Seoul's Transformation Over The Last 50 Years (1970-2020) ⁴

Rising through the destruction and turmoil left by the Korean War, the city of Seoul has transformed to a global megalopolis in only 50 years. Seoul underwent several phases to overcome significant urban challenges and become a model smart city full of urban development best practices.



Photo: Seoul Photo Archives

1960S-1980s

To accommodate increasing population and address inadequate social infrastructure, the Seoul Metropolitan Government formulated urban development plans and implemented projects tailored to address the city's urban challenges.

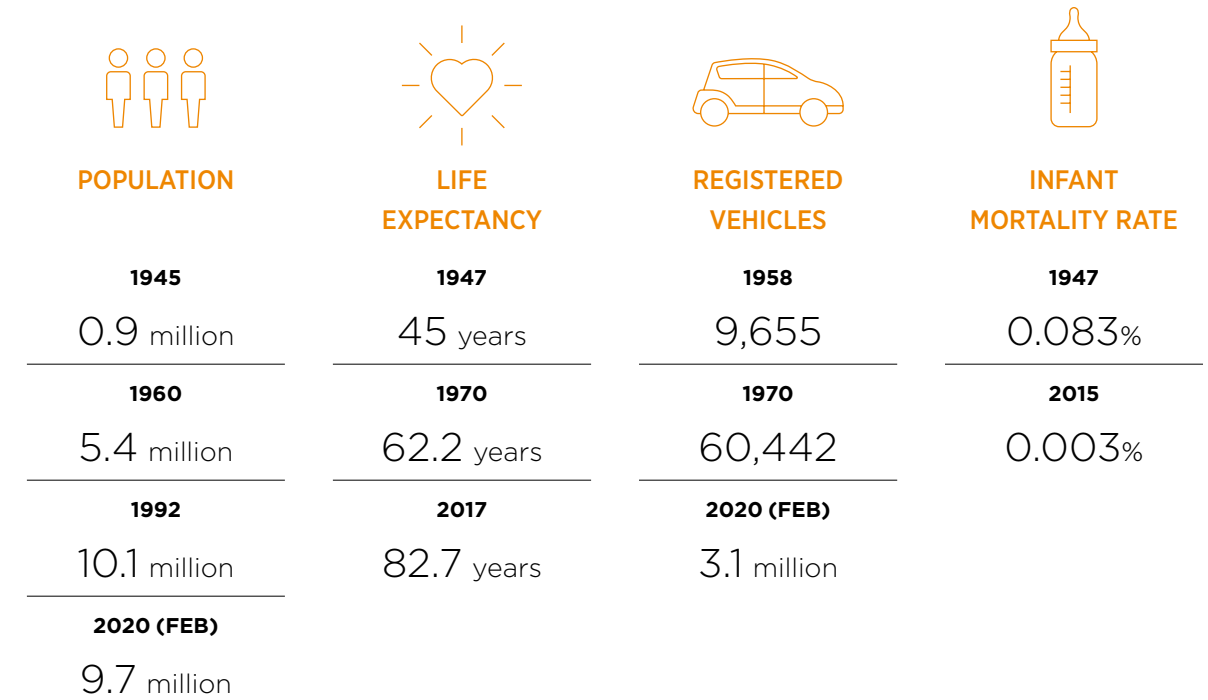
1980S-2000s

Extensive urban development planning continued, and policies were put in place to beautify the city. Subsequently, Seoul's infrastructure network flourished with quality transport, water and sewage systems.

2000-PRESENT

Seoul adapted a software-centered approach to its urban management policy. The use of advanced information technology helped Seoul facilitate a sustainable city and improve the well-being of its residents and visitors.

The implementation of extensive development projects spurred demographic change across the city of Seoul, providing a quality living environment for its nearly 10 million residents.



Cheonggye-cheon Restoration Project (CRP)

Cheonggye-stream was once a symbol of the culture of the people of Seoul, a place where traditional celebrations were held, where women did their washing and where children played. Over time the poor built settlements and shanty

towns and pollution became an issue and serious problem. In 1958 the decision was taken to cover the stream for public safety and from 1968 to 1978 an expressway was constructed over the covered stream.

The area became the most overcrowded part of the city with 60,000 businesses, 200,000 shopkeepers and over 1 million people per day passing through causing severe congestion and crime. The business district underneath the expressway became synonymous with Seoul's deterioration. For 40 years the covering of the Cheonggye-stream to ensure public safety led to additional problems. The Cheonggye-stream

Restoration was a visionary approach to remake downtown Seoul. After city leaders held over 1500 meetings with local stakeholders the expressway was removed and the river restored. Now the river and pedestrian paths are a popular greenspace providing residents with a peaceful reprieve from city life. The project represents a new model for cities and city dwellers and the start of new evolution.



Photo (Left and Center): Seoul Museum of History; University of Seoul

MAJOR OUTCOMES

- Environment—average daytime temperature in the area dropped
- Economic vitalization
- Traffic—discouraged driving cars in the center, eased traffic flow, \$1 public transport system

PROJECT SPANNED

5.8 km



IMPLEMENTED OVER

1 year

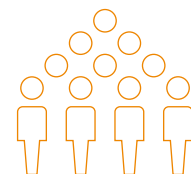
for planning and preparations

2 years & 3 months

for construction

TOTAL LABOR FORCE OF

700,000



TOTAL COST

\$305 USD million

Fully funded by Seoul Metropolitan Government (already owned most of the land used by the elevated highway redirected and earmarked funds for maintenance of deteriorated elevated highways).

DESIGN

\$1.7 USD million

CONSTRUCTION

\$294 USD million

LAND ACQUISITION

\$2.3 USD million

PROJECT MANAGEMENT

\$6.1 USD million

ADMINISTRATION

\$0.5 USD million

Overview of Korea's Green Growth Approach



Initiated by the necessity to adopt sustainable practices, Korea underwent a development paradigm shift from quantity to quality-oriented growth, and from fossil fuel-dependent to energy independent growth and sustainability. Korea's green growth was propelled by the establishment of key institutional arrangements that created an enabling environment and laid the foundation for advancement through legislative, institutional and strategic frameworks. In 2008, Low Carbon, Green Growth was declared as a new vision and Green New Deal for the nation for the next 60 years, and the green growth action plan was promoted thereafter.

Countries around the world are finding the Green Growth model highly relevant.

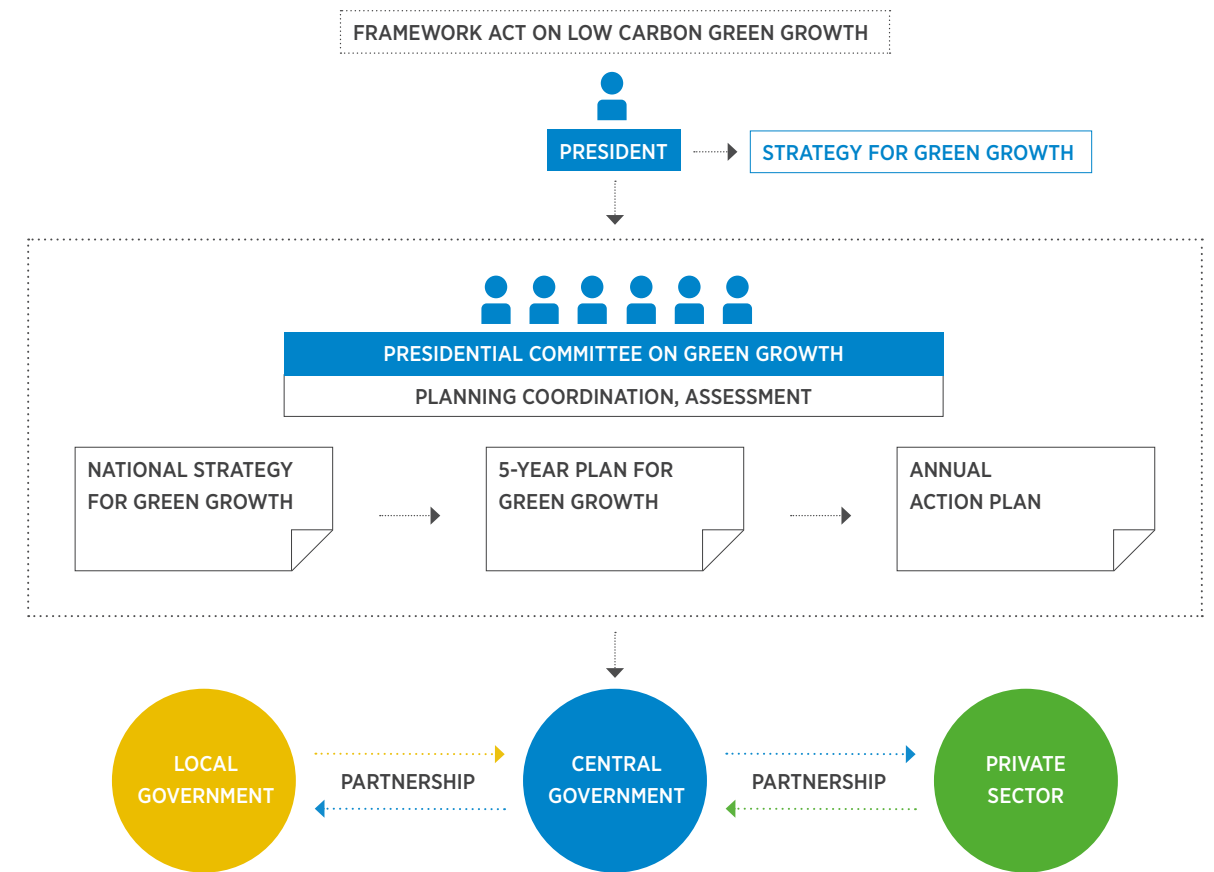
INSTITUTIONAL FRAMEWORK

The Presidential Committee on Green Growth (PCCG) was established in 2009 to spearhead Korea's Green Growth Transformation. Specifically, the PCCG developed and mandated the legal framework, strategic planning, and budget allocation for the National Strategy.

The Committee on Green Growth was instituted several years later in 2013 with the main function of deliberating matters concerning Green Growth. The Committee was comprised of 38 people: 21 Private Experts and 17 ministers, Co-chairs: Prime Minister and one Private Expert and 4 Sub-Committees focused on:

- Green Growth Strategy
- Climate Response
- Green Technology and Industry
- Energy

Figure 2 Institutional Framework for Green Growth



LEGISLATIVE FRAMEWORK

The Framework Act on Low Carbon Green Growth was enacted in 2010. It provided the legal basis for implementing measures to effectively address climate change and energy issues, promote sustainable development, build the implementation system for green growth (such as the establishment of the Committee on Green Growth), and revise a variety of institutional systems to promote low-carbon green growth in the region.

The major provisions in the Framework Act include:

- The realization of the green economic system, green technology and green industries.
- Policies on energy, sustainable development; the green life, the green homeland and the low-carbon traffic system.
- International negotiations and cooperation in relation to low carbon, green growth, including climate change.
- Procurement of financial resources, taxation, financing, training of human resources, education, and public relations activities necessary for low carbon, green growth.

STRATEGIC FRAMEWORK

The National Strategy for Green Growth (2009-2050), provides a comprehensive policy framework towards green growth. Launched in 2009, the strategy aims to promote eco-friendly new growth engines, enhance people's quality of life, and contribute to international efforts to fight climate change. To achieve the goals set in the National Strategy, South Korea rolled out a series of five-year plans with the following objectives:

Definition of Green Growth:

Growth that registers harmony between economy and environment that reduces climate change and environmental damage by saving and efficiently using energy and resources and creates jobs by exploiting new growth engines through R&D in clean energy and green technology.

*Article 2, Section 2 of Low Carbon Green Growth Framework Act (hereafter the Framework Act)

The government set a budget target to allocate 2% of GDP for Phase 1 (2009-2013)
Total: 107.4 trillion KRW (98.1 billion USD (1/1/2013))⁵

	Total	'09	'10-'11	'12-'13	Growth
Public Investment (trillion KRW)	107.4	17.5	48.3	41.5	10.2%
Adaptation to climate change	56.9	8.6	29.2	19.1	14.0%
New growth engine	28.6	4.8	10.8	13.1	9.4%
Better life quality	27.9	5.2	10.5	12.2	3.6%

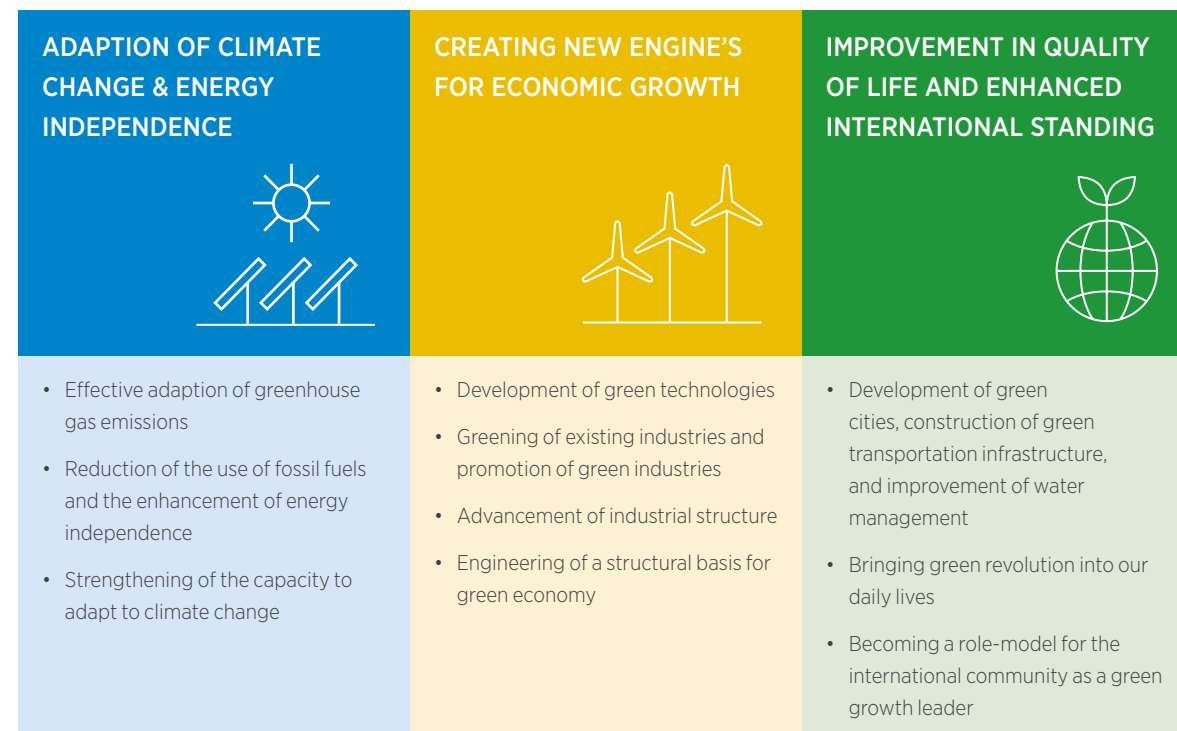
The 1st Five-Year Green Growth Plan 2009-2013

- Adaptation to climate change and energy independence
- Creating new engines for economic growth
- Improvement in quality of life and enhanced international standing

The 2nd Five-Year Green Growth Plan 2014-2018

- Establishing a low-carbon socio-economic infrastructure
- Achieving a creative economy through the convergence of green technology and ICT
- Building a pleasant living environment safe from the harms of climate change

Figure 1 Three Objectives and Ten Directions of Green Growth



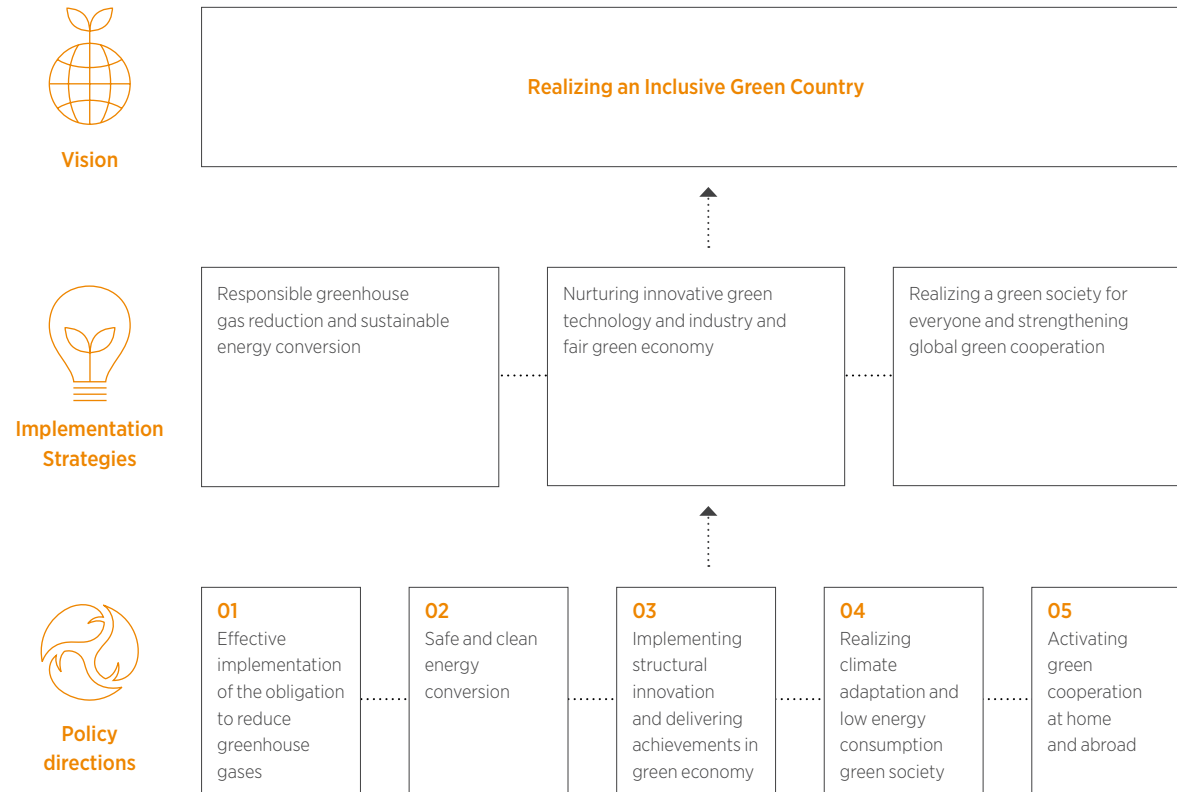
MAJOR ACHIEVEMENTS 2009-2019⁶

10 years of Green Growth Policy implementation has:

- Facilitated the adoption of Green Growth as an agenda for national development and the institutionalization of Green Growth promotion.
- Led to an increase in the supply of green products and efforts for actualizing green lifestyle.
- Aided in preparing the basis for preemptively setting the GHG reduction target and system.
- Enhanced national standing by setting green growth as a global agenda by establishing and engaging related internal organizations.
- Established the foundation for future growth engines through the development of green technology.

**The 3rd 5-Year
Green Growth Plan ⁷**
2019-2023

- Responsible greenhouse gas reductions and sustainable energy convergence
- Nurturing innovative green technology, industry and fair green economy
- Realizing a green society for everyone and strengthening global green growth cooperation



New Solutions to Old Problems

Ambitious Plan Generating Energy from an Open Landfill

Rapid urbanization and economic growth in Seoul inevitably increased waste volume from household and industrial sites, and due to lack of official waste disposal sites, municipal solid waste was disposed of at open landfill sites. A low-lying island located on the Han river was chosen as Seoul's official dump site in 1978 for its easy accessibility

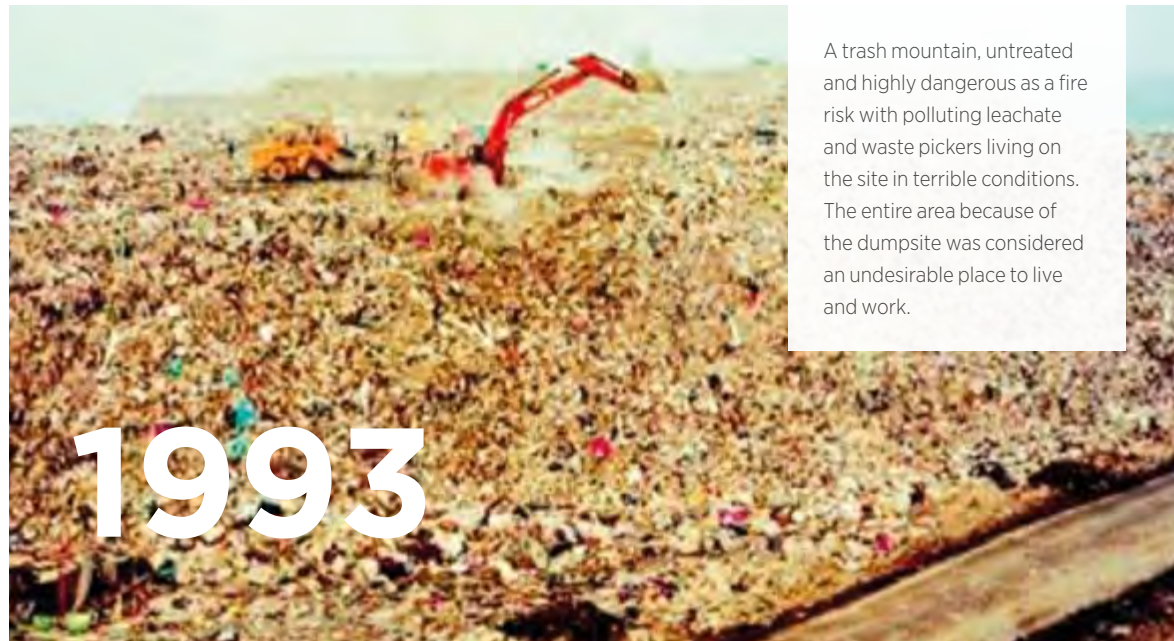
and close proximity to downtown. The beautiful island became a toxic trash mountain with 28,877 tons of garbage emptied into the landfill every day throughout the 1980s. In the span of two years, the site was transformed to include an eco-park with recreational areas and walking paths, a World Cup soccer stadium, a golf course and more. Building

over the dumpsite and deploying technology to capture methane turned an unsustainable health hazard that depressed property values in the surrounding area, into an energy asset and beautiful greenspace for residents and visitors.

held in October when the silver grass is in bloom. Once an eyesore on its skyline, Haneul Park and Seoul have become a model for energy and solid-waste management innovation.

Sector integration is a key element in green growth thinking, planning and implementation. In most countries, the ministries that handle solid waste management and those that handle energy infrequently work together, yet now with new technologies collaboration can bring about innovative solutions.

Completed in four years, Haneul Park is the most popular of the five parks situated in World Cup Park. Like its name Haneul, which means "sky" in Korean, the park is situated on the highest part of World Cup Park and offers breathtaking views of Seoul. Today it attracts 10 million visitors annually, is a popular location for weddings photos, and plays host to Seoul's annual Silver Grass Festival,



A trash mountain, untreated and highly dangerous as a fire risk with polluting leachate and waste pickers living on the site in terrible conditions. The entire area because of the dumpsite was considered an undesirable place to live and work.

1993



Present

The Park was completed on time for the World Cup in 2002, and has become the symbol of Seoul as a world leading Eco-City. The transformation of the trash mountain to a recreational park and generator of energy changed public perception on waste treatment

facilities and represents Seoul's paradigm shift in Ecological Management. Because of the transformation, the area now includes residential apartment buildings, schools and local businesses. A thriving and healthy community was built in the course of a few years.

Before 1970's

Before the 1970s the park was a small island, chosen as the first official landfill site for Seoul.

1970's to 1990's

The island was used for open dumping, it was an unsanitary landfill from 1970s—1990s and Seoul's main landfill from 1978 to 1993.

1992

Sangam development and new town plan was announced in 1992, as part of Seoul's Basic Redevelopment Plan.

1993

The landfill site was officially closed down in 1993.

1998

In 1998 Seoul selected the Sangam area to host the World Cup, which set a firm deadline for cleaning up the toxic landfill site.

Ambitious Plan

An ambitious vision transformed the country's largest landfill into an energy producing asset. The implementation committee was divided into two organizations that worked to engage local stakeholders and ensure a fast transition.

- New Millennium Preparation Committee
- Seoul Institute— focused on planning & design

TOTAL COST

\$203 USD million

ON STABILIZATION

63%

ON PARK DEVELOPMENT

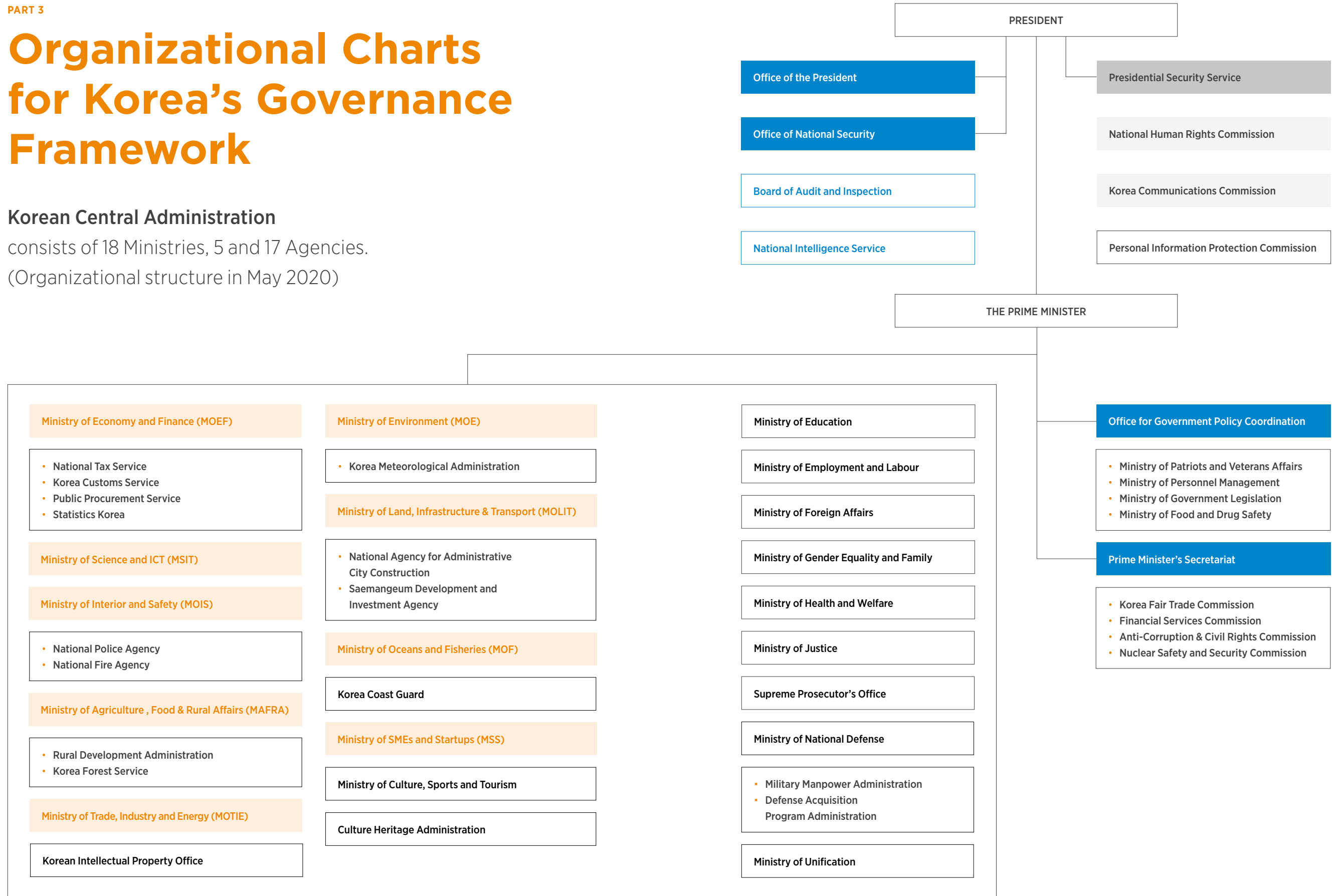
33%

PART 3

Organizational Charts for Korea's Governance Framework

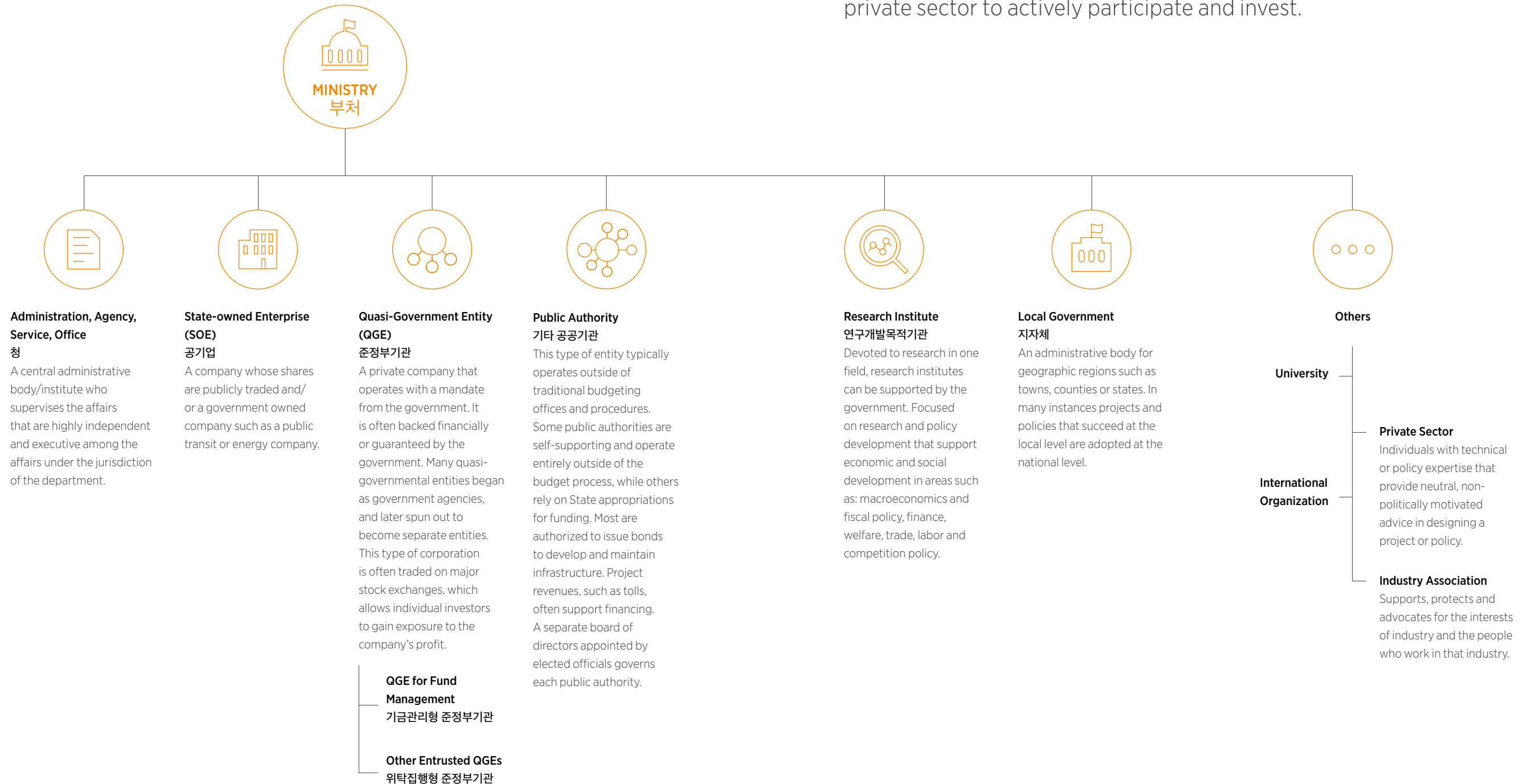
Korean Central Administration

consists of 18 Ministries, 5 and 17 Agencies.
(Organizational structure in May 2020)



Institutional Roles and Functions in Korean Governance

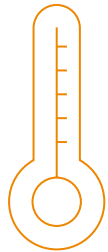
Much of Korea’s successful transformation from war-torn country to global leader is a direct result of institutional frameworks and strategically designed governing structures. Establishing effective institutional frameworks allows for long-term strategic planning and investments. When done correctly, such long-term planning can align citizens’ interests and nation building with clear opportunities for the private sector to actively participate and invest.





PART 4

Agriculture in Korea

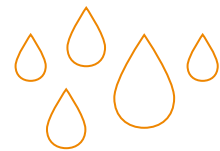


CLIMATE

The average annual temperature in South Korea ranges from 6°C to 16°C. Excluding mountainous regions, the temperature ranges from 10°C to 16°C.

In 2018, the average monthly temperature ranged from -1.9°C to 27°C. The highest temperature was recorded at 32°C and lowest temperature was -6.2°C.

Depending on which region, soil temperature ranges from 23°C to 33°C in the summer and -2.8°C to 5.3°C in the winter.



PRECIPITATION

The amount of annual precipitation is 1,500mm in the southern region and 1,300mm in the central region. Seasonally, about 50% to 60% of annual precipitation falls in the summer, and 5% to 10% falls in the winter.



HOUSEHOLDS AND POPULATION

In 2018, the number of farm households in South Korea was 1,020,838 which was 5.1% of the total number of households (19,979,188). Farm population reached 2,315,000 people representing 4.5% of the total population (51,606,633 people).

There was approximately 1,185,000 females and 1,130,000 males and more than 75% of population was above the age of 50 (58% are above the age of 60).



AREA AND TOPOGRAPHY

THE TOTAL AREA OF SOUTH KOREA

100,284 km²

FARMLAND

17.1%

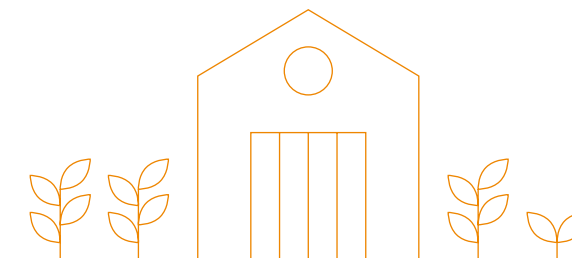
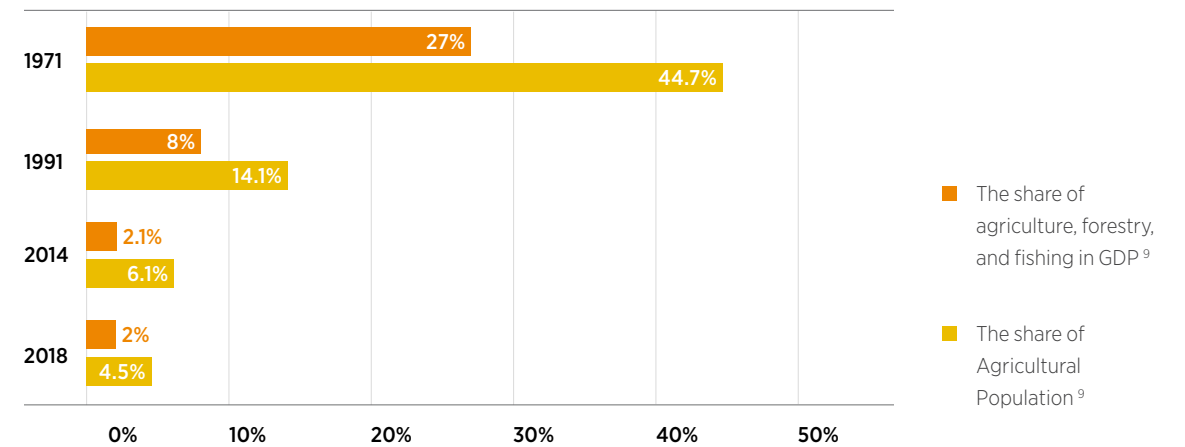
FOREST

63.5%

OTHERS

19.4%

THE NATIONAL ECONOMY AND AGRICULTURE ⁸



42,066,000 krw

Average farm household income (approximately 38,000 dollars) in 2018.

\$44.1 billion

The **value of agricultural and forestry products** was 44.1 billion dollars in 2018.

21,659

The **number of agricultural corporations**, which includes agricultural cooperatives, was 21,659 in 2017.

\$188.8 billion

The **domestic food industry generated** 188.8 billion dollars, which consists of food and beverage manufacturing (77.7 billion dollars) and the restaurant industry (111.1 billion dollars) in 2017.

\$12.6 billion

Total budget of MAFRA was 12.6 billion dollars in 2018, which accounted for 3.38% of the total national budget ¹⁰.

Source: Rural Development Administration

Korea's Agricultural Policy History and Interests

1980-1989

Agricultural commercialization and spread of capital-intensive farming:
Green House → White Revolution

1990-1999

Liberalization of Agricultural Imports:
Structural reforms in the agricultural sector during and after the **Uruguay Round**.

1950-1969

- Establishment of Owner Farming System through Farmland Reforms
- Food shortages and the Grain Aid through PL ('Public Law') 480
- **The first 5-Year Economic Development Plan:** Main goal was to achieve food self-sufficiency through greater productivity of agricultural products. The government implemented a massive agricultural development project.

1970-1979

- **Saemaul Movement**
(New Village Development Movement)
- **Tong-il Rice → Green Revolution**

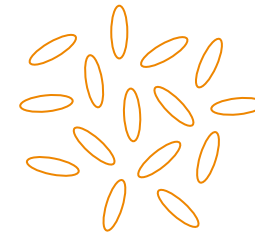


2000-PRESENT

- **Free Trade Agreements (FTAs)**
- Paradigm Shift of Agricultural Policies and Industrialization of Agriculture:

The "Food Industry Promotion Act" was enacted and the "Comprehensive Plan to Develop the Food Industry" was established. The government started to expand R&D investment and make agriculture efficient and carried out various policies to develop a knowledge-based agro-food industry.

The Korean government placed emphasis on the vitalization of the rural economy through the sixth industrialization of agriculture. This includes development of food processing, local food, and rural tourism.



GREEN REVOLUTION

In 1971, Tong-il Rice, a high-yield rice variety, was developed through a partnership with the International Rice Research Institute (IRRI). It contributed to the exponential increase in rice production in Korea. Additionally, the installation of protected nurseries, early cultivation, timely fertilizing, and thorough pest control contributed enormously to the rise in rice yield per unit area.

As a result, rice production, which was a mere 3.5 million tons in the late 1960s, soared to over 5 million tons in the late 1970s. This enabled Korea to achieve self-sufficiency in rice cultivation, one of its staple grains. It also increased farm household incomes and helped Korea overcome chronic food shortages. Continuous research and development of agricultural varieties, and cultivation technologies such as agricultural machinery and vinyl also played critical roles in the success of the revolution.

WHITE REVOLUTION

By the 1980s, Korea had achieved economic growth and food self-sufficiency. This came with an increase in health consciousness and a rise in the demand for fresh vegetables. Korea had entered a new era that required more research and technology to ensure consistent vegetable supply.

As a result, green house cultivation technology and various facility gardening technologies were developed and distributed. Korea's greenhouse development helped revitalize the rural economy and greatly contributed to an increase in farm household income during winter season (White Revolution). It further resulted in the development of simple green house cultivation, standardization house, automated-cultivation facility, high-tech glass green house, and smart green house.

URUGUAY ROUND

Uruguay Round, concluded in December 1993, is the 8th multilateral trade negotiation originated from the General Agreement on Tariffs and Trade (GATT) in 1986. Countries around the world fiercely negotiated to attain their own interests under the condition of comprehensive tariffication of agricultural products ('open market'). With the Uruguay Round Agreement in 1993, the following were agreed to: liberalization of import-restricted items, abolition of agricultural subsidies and double grain additives, and suspension of agricultural fund loans.

As a result of the Uruguay Round Agreement, structural improvement on agricultural administration was implemented in Korea. The World Trade Organization (WTO) was established in 1995 to replace the General Agreement on Tariffs and Trade (GATT). With the launch of WTO, Korea managed to increase the amount of service trade and export more IT products.

Source: 'Agriculture in Korea' by Korea Rural Economic Institute; Rural Development Administration

Agriculture and Food: Saemaul Undong, A New Village Movement (1971 – 1978)

Saemaul Undong was a rural community driven development program launched in the 1970s to address widespread rural poverty in the Republic of Korea. While urban income grew as a result of industrialization and the implementation of economic development plans in the 60s, the

rural sector was facing relatively slow growth. Saemaul Undong became a key government policy in helping to close the urban-rural wage gap by increasing the rate of growth of rural household incomes.



“The important factor is that there should be a sincere desire to improve things at the grassroots level. The local officials should provide such an atmosphere to induce the villagers to work hard.”

“To keep clean by sweeping dust in the front of area of one’s home gate is far more important than talking about the importance of loving the nation.”

FORMER PRESIDENT PARK CHUNG-HEE

Saemaul Undong was implemented from 1971 to 1979 under President Park Chung-Hee under four **government-defined objectives**:

- Modernizing Infrastructure
- Raising Household Income
- Reforesting Mountains
- Improving Overall Rural Environment

To encourage mass appeal and acceptance, the movement was established on a spiritual foundation of **three components**:

- Diligence
- Self-help
- Mutual Cooperation

Stages of Implementation ¹¹

Annual Household Income Growth (thousands of won)

	Rural Farmer	Urban Laborers
Stage One (1971-1973) Saemaul Undong commenced with government-initiated projects and activities focused on upgrading basic rural infrastructure and rural income generation.	356.4 → 480.7	451.9 → 550.2
Stage Two (1974-1976) Agricultural production infrastructure projects were broadened from individual to inter-village level, while income generating projects were advanced to agribusinesses and cottage industry facilities.	674.5 → 1,156.3	644.4 → 1,151.8
Stage Three (1977-1979) The movement was broadened to include urban area residents and emphasis was placed on dissemination and spreading the acceptance of the Saemaul Undong principles.	1,432.8 → 2,227.5	1,405.1 → 2,629.6

AMOUNT OF INVESTMENT

under the Saemaul Undong movement during 1971-1979 amounted to:

TOTAL
2,752.1 billion
(KRW)

GOVERNMENT SUPPORT
772.5 billion
(KRW), 28%

LOCAL COMMUNITIES
1,979.6 billion
(KRW), 72%

MAJOR OUTCOMES (1971 – 1979) ¹²

VILLAGE ACCESS ROADS IMPROVEMENT

43,631 km

SMALL BRIDGE CONSTRUCTION

68,797

WATER RESERVOIR INSTALLATION

24,140

COMMUNITY HALLS BUILT

37,000

INTERNAL VILLAGE ROADS IMPROVEMENT

42,220 km

RIVERBANKS IMPROVEMENT

7,839 km

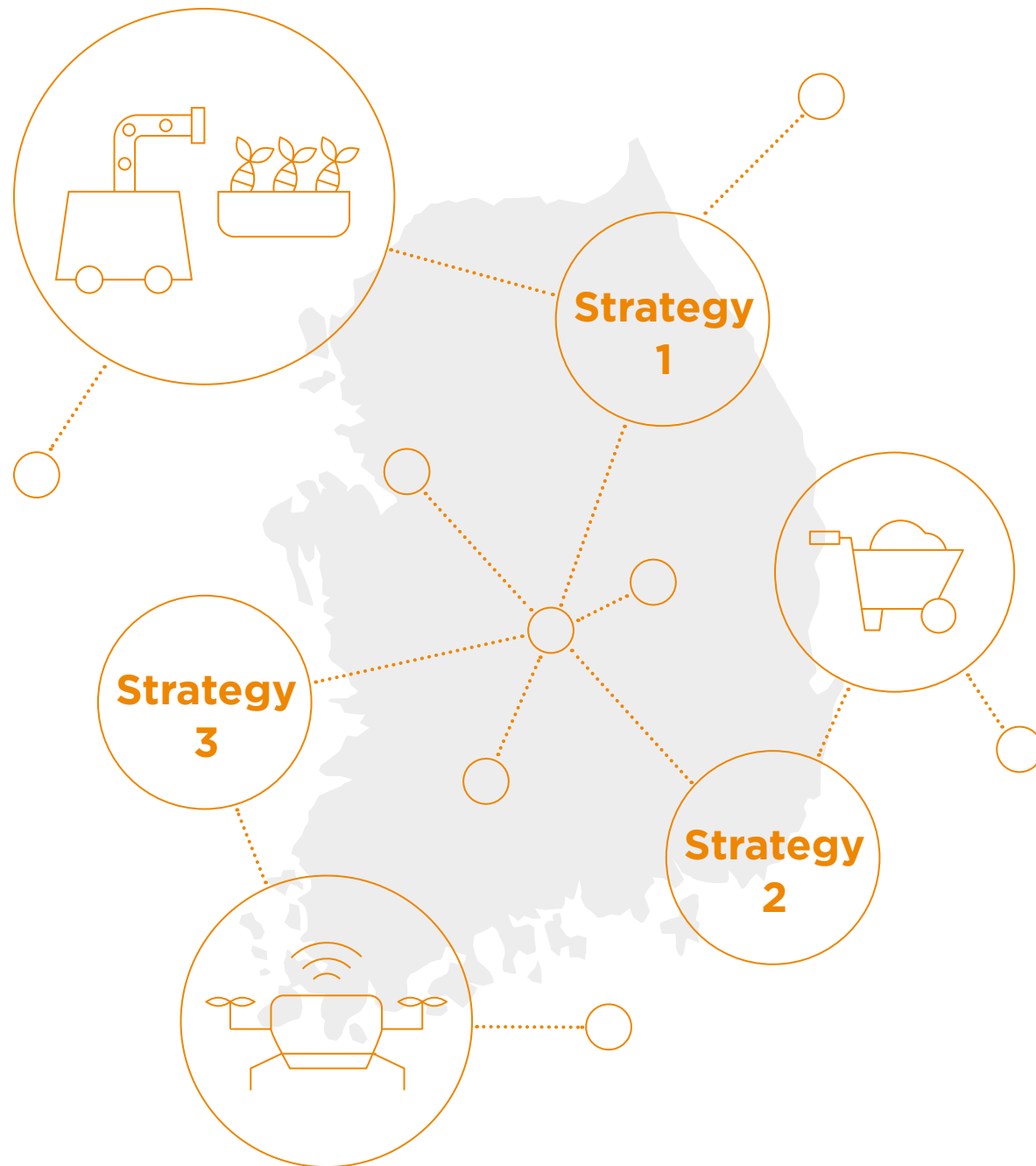
FARMHOUSES ELECTRIFIED

98%

REPLACED THATCH ROOFS

2,456,000

Korea's New Agricultural Research Priorities



Strategy 1: Incorporate Innovation into Agriculture

Innovation and agricultural technology can lead to improvements in people's quality of life. Korea aims to achieve this through the development of highly productive and convenient Smart Farms that apply convergence technology to agriculture with on-site consultation and training based on big data and automated remote sensing technologies.

Korea is also focused on establishing cutting-edge technology and precision agricultural production systems to increase productivity and reduce labor force through automation and robotization technologies. In addition, Korea is producing edible insects as innovative safe food products to enhance agriculture and rural viability. The insects can be developed into food, drugs and medical materials.



Strategy 2: Revitalize agriculture and rural communities

Revitalization of agriculture and rural communities is being achieved through technology distribution and human resource development in Korea. The rapid distribution of tailored technologies and various programs and projects for farmers' helps improve quality of life and cultivates happier living conditions. Field-oriented and people-centered communication provides solutions to the farmers' and rural communities concerns and issues.

Korea is also advancing its international cooperation by developing and exchanging agricultural technologies with partner countries. The transfer of agricultural technologies by Korea to developing countries contributes to addressing food security and poverty issues.



Strategy 3: Integrate advanced technology with agriculture

Korea is using customized agricultural machineries and advanced technology to increase competitiveness and attain self-sufficiency. Varieties and upland crops that are suitable for mechanization and advanced technology are being cultivated, in addition to technologies for stable agri-food production in the advent of climate change. The utilization of agricultural biotechnology and the promotion of the seed industry by securing various genetic resources is enhancing healthier agriculture for Korea's people.

Agriculture and Food: Korea's Agriculture R&D Edible Insect Products

WHY INSECTS?

The impact of population growth and the effect of climate change on agriculture and food production has intensified the need to consider innovative solutions towards food security. Insects provide a promising option for alternative food for humans and livestock that can be produced efficiently. Insects can also be used for pest control, pollination activities, environmental purification (through decomposition of food waste), and resources for scientific research.

Researchers have found that the consumption of edible insects is linked to health benefits due to the associated activation of immunological responses and high levels of protein. In addition, the production of edible insects is environmentally friendly. It requires much less water (1L per 1kg) than livestock such as beef (1,500L per 1kg) and produces three to seven times less carbon dioxide while bypassing adverse results such as soil and water contamination from the blood in butchery processes.



MARKET SIZE IN KOREA (2020)
 US \$85 million
INSECT-REARING FARMS (2018)
 2,318

TYPES OF KOREAN EDIBLE INSECT PRODUCTS
 200
 (including energy bars, cookies, noodles, alcohol, oriental medicine, nutritional supplements)

SPECIES USED FOR RAW MATERIAL AND FOOD (2020)
 10

INSECT EXPORT RESEARCH GROUP
 to develop overseas markets.

KOREA'S APPROACH

Recognizing the benefits of edible insects, Korea developed a comprehensive insect industry development plan. The plan comprises the first and second phases of Five-Year Plans covering insect industry development policies and promotional projects.

Phase One Objectives - Five Year Plan of Insect Industry Development (2011-2015)

- Establishing an institutional framework that incorporates the insect industry into the existing agricultural paradigm.
- Building a production base, developing an insect resource, and establishing a support center.
- Research and Development, government-led during early stages with a focus on fundamental research.
- Fostering, designating, and managing a professional workforce.
- Increasing general awareness and understanding of the insect industry.

Phase Two Objectives - Five Year Plan of Insect Industry Development (2016-2020)

- Enhancing consumption and improving distribution systems with a strong network among all the actors in the insect industry.
- Developing a new market by expanding consumption channels and identifying foreign markets.
- Building an effective production base by building a supply system of superior species and improving insect disease control.
- Establishing industrial infrastructure by expanding a practical R&D system, reforming legal and institutional bodies, training workforce, and performing multi-insect industry statistics.

IMPLEMENTING INSTITUTIONS

The Ministry of Agriculture, Food and Rural Affairs (MAFRA) and Rural Development Administration (RDA) plan and establish insect industry development policies. Local government organizations (nine agricultural research and extension services and 156 technology centers) foster customized insect-related businesses by focusing on education and pilot projects.

Ministry of Agriculture, Food and Rural Affairs (policy-focused role)

- Insect Industry Promotion and Support
- Investment Assistance and R&D support
- Expansion of the industry, serves as the insect industry platform

Rural Development Administration (R&D focused role)

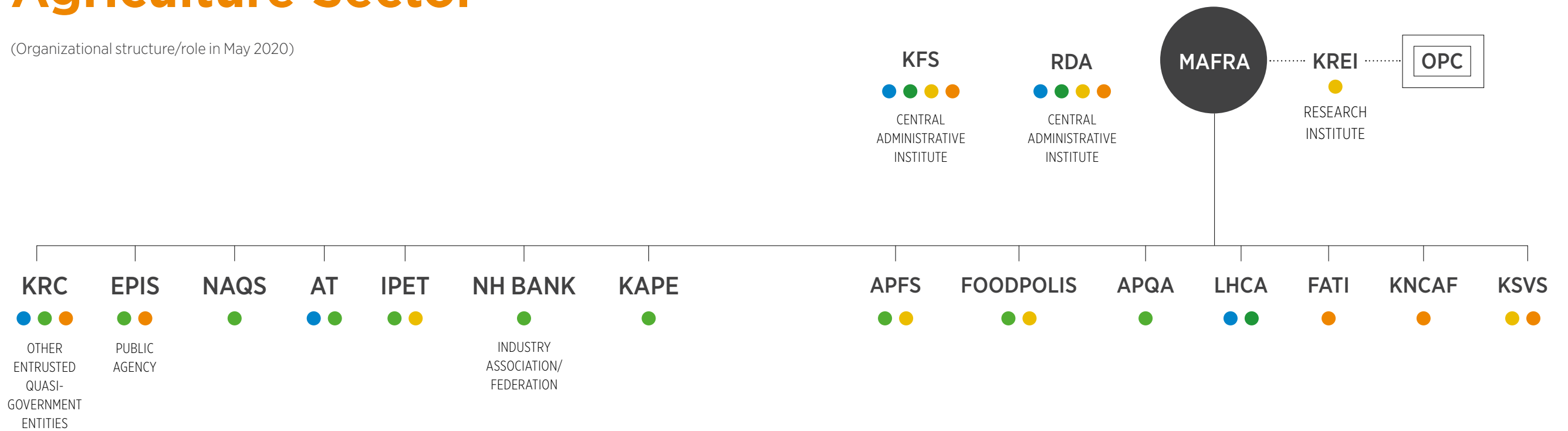
- Investigation, classification and identification of food and feed insects
- Establishment of physi-ecology, pathology, and mass rearing system for food and feed insects
- Research on industrialization and development of new high value-added materials

Local Government

- Industrialization support through Local Insect Resource Centers
- Contributing to balanced development among regions
- Market expansion of insect products by promoting domestic insect industry

Key Institutions in Agriculture Sector

(Organizational structure/role in May 2020)



The Ministry of Agriculture, Food and Rural Affairs (MAFRA) was established in 1948 and is responsible for enforcing regulations pertaining to overall agricultural and rural policies and quarantine inspection of agricultural products, including livestock, dairy, and forestry products. One of its main responsibilities, among others, is the commercialization of R&D outcomes in the agri-food industry and the development of private R&D capacity, applied and development research.

Strategic areas of focus for MAFRA revolves around three core pillars:

- Increasing incomes for farmers
- Enhancing the welfare of citizens in rural areas
- Improving agricultural competitiveness.

The Ministry has been contributing to the international community through implementation of ODA projects focused on agriculture and livestock. In particular, it has been facilitating communication between ODA stakeholders and sharing key project outcomes since 2017 through the Global ODA Forum. In addition to the forum, in 2013, the Ministry established the Korea Agricultural Policy Experiences for Food Security program (KAPEX), an agricultural policy consulting program that provides joint inspection, invitational training and workshops to three partner countries every year to identify new ODA projects. [[See agenda for 2018 ODA forum](#)¹³]

Independent External Institute

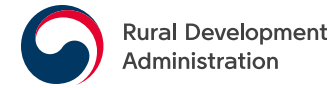
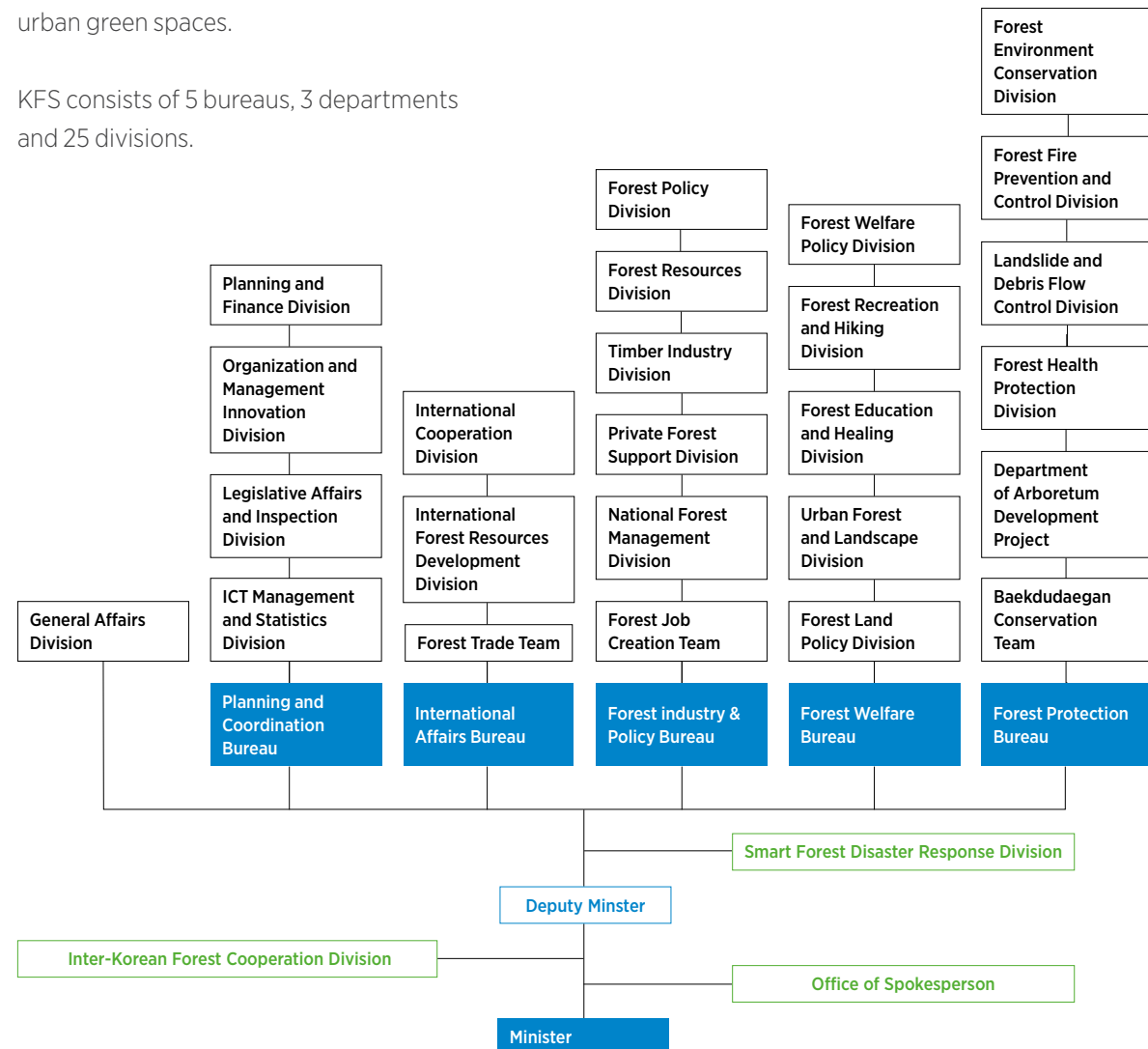


Korea Forest Service (KFS)

KFS was established in 1967 (formerly known as Forest Bureau of the Ministry of Agriculture and Forestry) and is responsible for the establishment and implementation of forest policies and laws. The KFS implements forest policies that support the public with an improved quality of life by offering recreation forests, healing forests, mountaineering services and the expansion of urban green spaces.

KFS consists of 5 bureaus, 3 departments and 25 divisions.

KFS has affiliate agencies such as the Forest Aviation Headquarters, National Institute of Forest Science, the National Arboretum, and the National Recreation Forest Office. Each province and metropolitan city have their own local forestry administrative organizations.



Rural Development Administration (RDA)

Established in 1962, The Rural Development Administration is a central administrative body under the Korean Government that works at the national and international level to improve quality of life through innovation in agricultural technology. RDA conducts agricultural research and development in parallel with deploying customized extension services to disseminate technologies that reduce costs and produce high-quality products.

ROLE OF RDA

- **Boosting Innovative Growth:** RDA develops and expands the use of smart agricultural technology while creating future growth engines through agricultural science and technology.
- **Facilitating Stable Production:** RDA works to respond to climate change and implement generic technology expansion for stable food production and safe, healthy agricultural products.
- **Enabling Rural Revitalization:** RDA provides support on agricultural and rural revitalization while distributing technology that supports social agriculture.
- **Advancing Global Competitiveness:** RDA facilitates the expansion of technology to improve the competitiveness of sectors and works to enhance global agricultural technology cooperation.

INTERNATIONAL ENGAGEMENT

International Agricultural Research and Development Program

RDA supports the enhancement of competitive global agriculture through strategic cooperation with developed countries on agricultural technologies. In addition, RDA contributes to ensuring national benefits and joint prosperity by responding to global challenges in agriculture.

Partners:

- 15 International Organizations & International Agricultural Research Institutes
- 20 National Agricultural Organizations



International Agricultural Development and Cooperation

Through the Korea Program on International Agriculture (KOPIA), RDA facilitates the transfer of technology to developing countries and provides responses to common agricultural issues through international collaborations and global networks. KOPIA works with partner countries to develop and disseminate locally adaptable agricultural technologies and increase smallholder farmers' productivity and income. The program develops and provides technology customized to the agricultural context of each partner country through regional initiatives.

Partner Countries:

22 (8 in Asia, 7 in Africa, and 5 in Latin America).
*Coming Soon: 1 in SAR and 1 in ECA)



REGIONAL INITIATIVES:

- Asian Food and Agriculture Cooperation Initiative (AFACI)
- 13 Member Countries and 6 Partner Organizations
- Korea-Africa Food and Agriculture Cooperation Initiative (KAFACI)
- 20 Member Countries and 6 Partner Organizations
- Korea-Latin America Food and Agriculture Cooperation Initiative (KoLFACI)
- 13 Member Countries and 4 Partner Organizations

ORGANIZATIONAL STRUCTURE:

RDA is organized into managing units, research institutions and extension services that play a key role in supporting the implementation of the organization's activities.

Management Units:

Planning and Coordination Bureau, Research Policy Bureau, Extension Services Bureau and Technology Bureau.

Research Institutions:

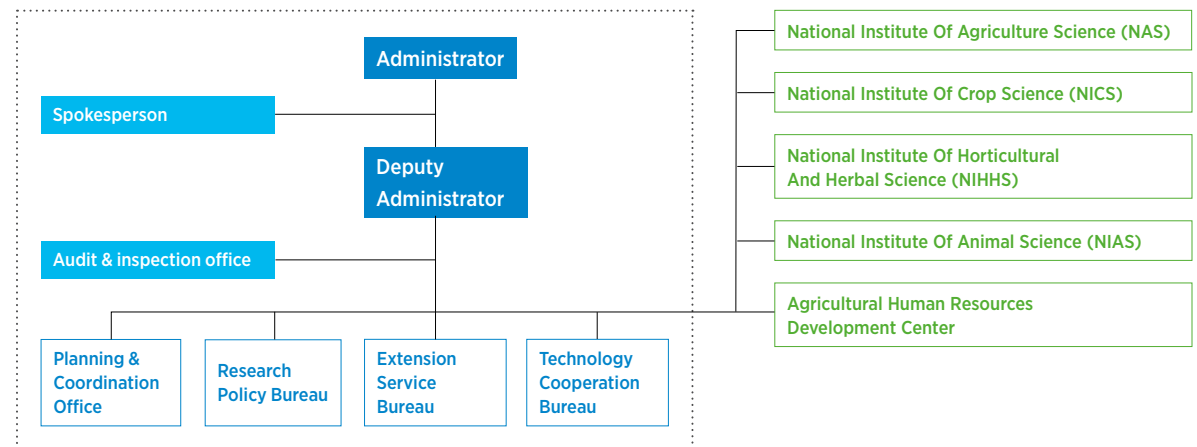
National Institute of Agricultural Sciences, National Institute of Horticultural and Herbal Science, National Institute of Crop Science, Agricultural Human Resource Development Center, National Institute of Animal Science and Foundation of Agriculture, Technology, Commercialization and Transfer.

Extension Services:

Provincial Agricultural Research and Extension Services and City/County Agricultural Technology Centers.

Inauguration
April 1, 1962 (Suwon) → Sept 15, 2014 (Jeonju)

Organizational Structure
Headquarters (4 Bureaus), 4 National Institutes



PERSONNEL (2020)

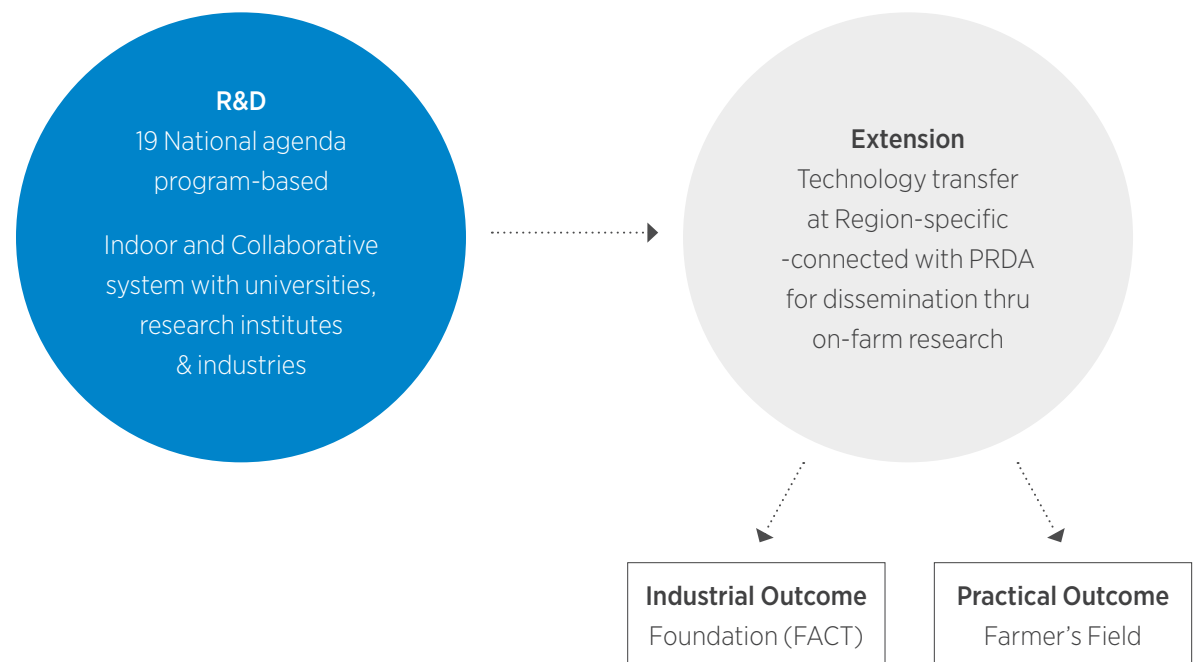
1,884

BUDGET (2020)

US\$ 852 million

- R&D 82%
- Operational Expenses 18%

Operating Systems



Other Entrusted Quasi-Government Entities (QGEs)



Korea Agro-Fisheries & Food Trade Corporation (AT)

AT, a government corporation under the Ministry of Agriculture, Food and Rural Affairs in Korea, was established in 1967 in order to increase the income of farmers and fishermen and contribute to the balanced development of the national economy. Major functions of AT are price stabilization of agricultural and fishery products, foreign trade promotion, marketing and food industry support.

AT ensures balanced supply and demand of agricultural products that are essential to the national diet by direct procurement, storage, release and import of agricultural products. Secondly, it promotes Korean Agricultural products to reach overseas market by providing financial support to private companies, developing new items and disseminating global market information. Thirdly, AT improves marketing functions and efficiency by wholesale market guidance and support, collecting and disseminating market information, training marketing personnel and operating Flower Marketing Center. Lastly, the corporation promotes agricultural and fishery products and stimulates the food industry by providing support to food processing companies in rural industrial complexes and production areas.

AT also operates across twelve overseas branches in the U.S. (LA & New York), Japan (Tokyo, Osaka), Europe (Paris), China (Beijing, Shanghai, Chengdu,

Hong Kong), Indonesia (Jakarta), Vietnam (Hanoi) and UAE (Dubai). The major functions of these branches is to perform market research and analysis of the agricultural produce to be imported and to promote agricultural trade between Korea and Foreign countries.

Its head office is in Naju-si, Jeollanam-do and it operates across eleven domestic branches in Seoul, Incheon, Gangreung, Daejeon, Chungju, Gwangju, Jeonju, Busan, Daegu, Changwon and Jeju.



Korea Agency of Education, Promotion and Information Service in Food, Agriculture, Forestry and Fisheries (EPIS)

EPIS was established in May 2012, as a public agency under the Ministry for Food, Agriculture, Forestry and Fishery in accordance with the [Article 11.2](#)¹⁴ of the Food and Industrial Basic Law for Agriculture and Fishery by integrating three other agencies that was in different agricultural business sectors (Education, ICT and Value Extension). EPIS' role is to efficiently promote development of human resources for agriculture and fisheries, facilitation of the informatization of agricultural food and rural communities, propagation and publicity of the value of rural community cultures, enhancement of the ability of agricultural and fishery business entities and provision of safety information on agricultural and fishery products.

The agency specializes in agricultural ICT, such as automated [Smart Farm](#)¹⁵ (Greenhouse), Farm Map using satellite, Agri-Statistics, and the education of farmers to adapt those ICT in their own farms as well as consumers, and government officials in developing countries. It is also responsible for delivering education and MAFRA training policies. One of its major projects is financial support for agricultural high schools and agricultural colleges. In 2015, EPIS supported 19 high schools and 14 colleges in delivering a practical curriculum to support students in advancing to an agriculture-related career.



Korea Institute of Planning and Evaluation for Technology in Food, Agriculture, Forestry and Fisheries (IPET)

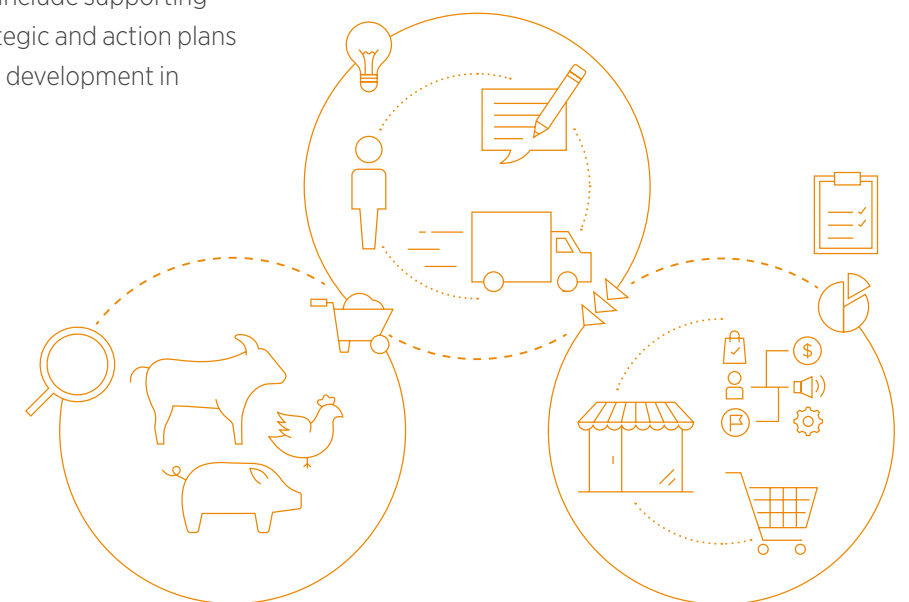
IPET established under Article 8 of the Act on the Promotion of Science and Technology in Food, Agriculture and Forestry is responsible for planning and supervising the competition-based R&D projects of MAFRA that are carried out by university research institutes, public R&D institutions, corporates, or private research institutes. Its major tasks include supporting the establishment of strategic and action plans to promote technological development in

food and agriculture; supporting the planning, management, and evaluation of MAFRA's R&D projects; examining technological capabilities in the food, agriculture, and fishery sectors; and providing support for developing human resources in the related fields



Korea Institute for Animal Products Quality Evaluation (KAPE)

Established in 1989, KAPE is a public institution that conducts grade-based evaluations, maintains the livestock products traceability system and operates livestock products distribution information projects to improve the quality of domestic livestock products and promote smooth distribution. KAPE certifies livestock products that have been produced by farms and conducts scientific grade-based assessments of livestock products to provide new value. The institute maintains the livestock products traceability system to increase trust and contribute to the healthy and happy lives of the people.



The production, grade, price, distribution and statistical information that is produced through major systems at KAPE are reprocessed through eKAPEpia website and OLAP services. The objective of this is to heighten the asset value of livestock products-related information and contribute to stable income generation for livestock farms.

KAPE's major projects include grading livestock products, animal products traceability, quality process management, animal products distribution status surveys and policy support projects.



Korea Rural Community Corporation (KRC)

KRC, a national corporation under MAFRA, was first initiated as farmers' union for water management in 1908. Since its foundation it has been responsible for the development, maintenance, and management of agricultural production infrastructure for over a century, focusing on the production of Korea's staple food, rice. The corporation has since been leading large-scale national projects including the world's largest Saemangeum reclamation project. Its core businesses include:

- **Water Resources Management** through construction of agricultural infrastructure (reservoirs, dikes, pumping stations, etc.)
- **Reclamation projects** including the world's biggest reclamation project (400 km in the Korean peninsula)

- **Generation of Clean & Green Energy** i.e. power generation incl. solar, wind, hydro, and geothermal
- **Rural Development** through management of Korea's farmland bank (pension program for senior farmers); urban-rural exchange; and smart-farm development.

In terms of area of international corporation, it began providing technical consulting services in 1967 (first project in Vietnam) including feasibility studies, design, and project management funded mainly by KOICA, EDCF, and MDBs. As of 2020, it has provided technical consulting services in across 21 projects in 13 countries. KRC also functions as an implementing agency for MAFRA's OAD projects in the agriculture sector. As of Feb 2020, it has implemented 19 ODA projects in 10 countries.

Public Authority



Agricultural Policy Insurance & Finance Service (APFS)

APFS is a public corporation under MAFRA established with the purpose of contributing and developing the agri-food industry by managing and supervising agriculture policy loans. APFS undertakes agriculture policy finance service management such as policy research, business administration and inspection for efficient operation of agriculture loans, insurance, and funds. Its core business functions include:

- Management of agriculture insurance including developing agriculture insurance policies
- Managing the FAFF (Food, Agriculture, Forestry, and Fishery) Funds of Funds
- Management of Agriculture and Fisheries policy loans



Korean National Food Cluster (FOODPOLIS)

FOODPOLIS is an industrial cluster in Korea focused on global agri-food exports and research and development. The complex houses businesses, research institutes, and public organizations. Established by MAFRA, the primary objective is to help build Korea's food industry by encouraging shared growth between large and small enterprises and the agricultural sector. Companies within the industrial complex benefit from a range of incentives, various R&D support centers, and programs ranging from food functionality evaluation to food quality and packaging.



Livestock Health Control Association (LHCA)

LHCA is a public veterinary institution that performs numerous duties including vaccination, clinical examination, collection and testing, sanitary inspections of livestock products, disinfection, and education and public relations for the prevention of livestock diseases. LHCA plays a critical role in improving the hygiene and safety of livestock products through livestock quarantine and livestock hygiene management. The association also contributes to the development of the livestock industry in Korea by supporting income increase for livestock farmers.

MAFRA-affiliated organization



Animal and Plant Quarantine Agency (APQA)

APQA is responsible for quarantine and sanitary control of animal and plant products with the goal of “Improving the Animal Disease Quarantine System and Securing the Safety of Agriculture and Livestock Products.” APQA is responsible for preventing the introduction of harmful weeds, pests and diseases originating from imported plants, fruits and vegetables. It consists of 3 departments including the department of animal disease control & quarantine; department of plant quarantine, & department of animal & plant health research. It operates across 23 divisions, 10 centers for animal disease control, and 6 regional offices across 22 districts.



Food and Agriculture Officials Training Institute (FATI)

FATI's objective is to train the government officials working for the Ministry of Agriculture, Food and Rural Affairs (MAFRA) and its related organizations so that they may be equipped with creative and innovative abilities. FATI also trains core farmers to lead in the agricultural industry and the rural community.

FATI is intensifying innovation and change management-based training to internalize the innovation drive of the government. To revitalize agricultural organizations and to improve its members' work capabilities, FATI is carrying out training for Human Resources Development

(HRD). FATI is also intensifying professional job training to increase knowledge on trade liberalization, food safety, computer skills and also to promote the management mind and leadership of the core farmers.



Korea National College of Agriculture and Fisheries (KNCAF)

KNCAF was established by the Korean government in 1997 to rear professional farm managers to cope with trade liberalization (since the launch of the WTO and the agreement of UR negotiation in 1995) and to enhance the competitive power of agricultural areas and foster the professional development of young farmers. KNCAF was established according to the proposal of the Special Commission on Agriculture, Fishery and Rural Development, on the Presidential Advisory Committee.

The objective of KNCAF is to develop professional farmers by equipping them with up-to-date knowledge of practices and theories to engage in the agriculture sector after graduation. As of July 2014, about 3,350 graduates were already leading in the improvement of agriculture all over the country. All fees for KNCAF students are paid by the Korean government at up to 200 million won (about US\$150,000) for successful engagement in agriculture (for up to 5 years). KNCAF provides the opportunity for short-term overseas training to all students and sends students overseas for training in agriculturally advanced nations such as U.S.A, Japan, Netherlands, Israel, etc.



Korea Seed & Variety Service (KSVS)

KSVS, a government organization under the Ministry of Agriculture, Food and Rural Affairs, established in 1974, is in charge of producing and distributing seeds for major agricultural crops (rice, barley, wheat and soybean); operating the plant variety protection system; management of seed marketing; and supporting the development of seed industry with various research and seed certification. KSVS has 4 divisions, 1 research center and 10 branch offices.

Its core missions are:

- To protect plant breeders' rights
- Enhance agriculture competitiveness
- Assist in the development and growth of the seed industry.

The organization holds several workshops such as the [Plant Variety Protection and DUS Testing workshop](#)¹⁶ at its headquarters in Gimcheon, Gyeongsangbuk-do (North Gyeongsang Province) which hosts seed specialists from all over the world including in Asia and Africa (ex. Myanmar, Uganda and Egypt). The workshops are designed to share information about plant variety protection systems and related technologies with countries that have recently adopted breed protection laws. As of 2015, 30 countries from around the world have taken part in the workshops since 2007.



National Agricultural Products Quality Management Service (NAQS)

NAQS is an implementing agency under MAFRA. It was established in January 1949 as the Agricultural Products Inspection Office (APIO) before it was renamed to the National Agricultural Products Quality Management Service (NAQS) in 1999. It specializes in agri-food quality management, “from farm to table”, including agri-food safety investigation, eco-friendly products and Good Agricultural Practices (GAP) certification system, management of origin, inspection of agricultural commodities and registration of agro-businesses. It is headquartered in Gyeongsangbuk-do and consists of 4 Experiment Research Institutes, 9 provincial offices and 117 branch offices.

Others

NongHyup Financial Group

NH Bank Industry Association (NH)

NH is a national Agricultural Cooperative Federation which provides banking and insurance services. The Federation offers cooperative credit, marketing, and banking services to farmers. National Agricultural Cooperative Federation serves customers worldwide.

It is an apex organization for the 1,155 multipurpose member cooperatives, representing 2.4 million member farmers in Korea. The NACF and the member cooperatives have a 47-year history of working on behalf of farmers and for agricultural development by providing services including:

- **Agricultural marketing and supply businesses** that support farmers from the field to the market, and cover production, processing and marketing.

- **Banking and insurance businesses** that include the banking businesses of the NACF, the mutual credit of the member cooperatives, as well as credit guarantees, insurance and credit
- **Livestock businesses** including production, processing, marketing and guidance services.
- **Guidance and extension services** including the promotion of farm industries and the cooperative movement, training to improve farming skills, and the provision of welfare facilities and guidance for specialized needs.

In terms of international cooperation, NACF aims to (i) establish contact with overseas cooperatives and organizations; (ii) research the model practices and management of these organizations; (iii) examine related agricultural trade policies; and (iv) play an intermediary role in the introduction of advanced agricultural technologies to increase competitiveness of Korean agriculture.

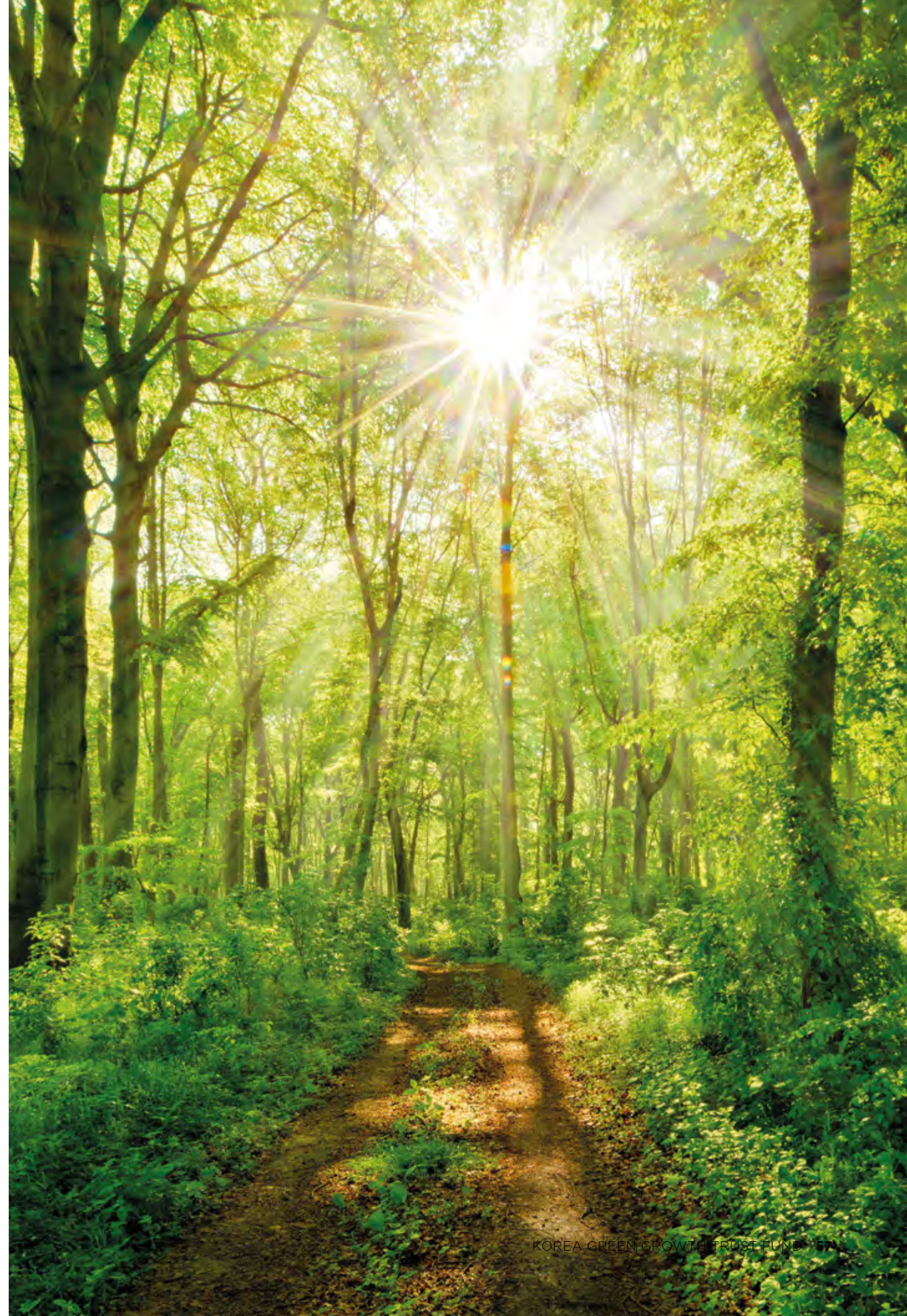
Under OPC but related to MAFRA

KREI 한국농촌경제연구원

Korea Rural Economic Institute Public Research Institute (KREI)

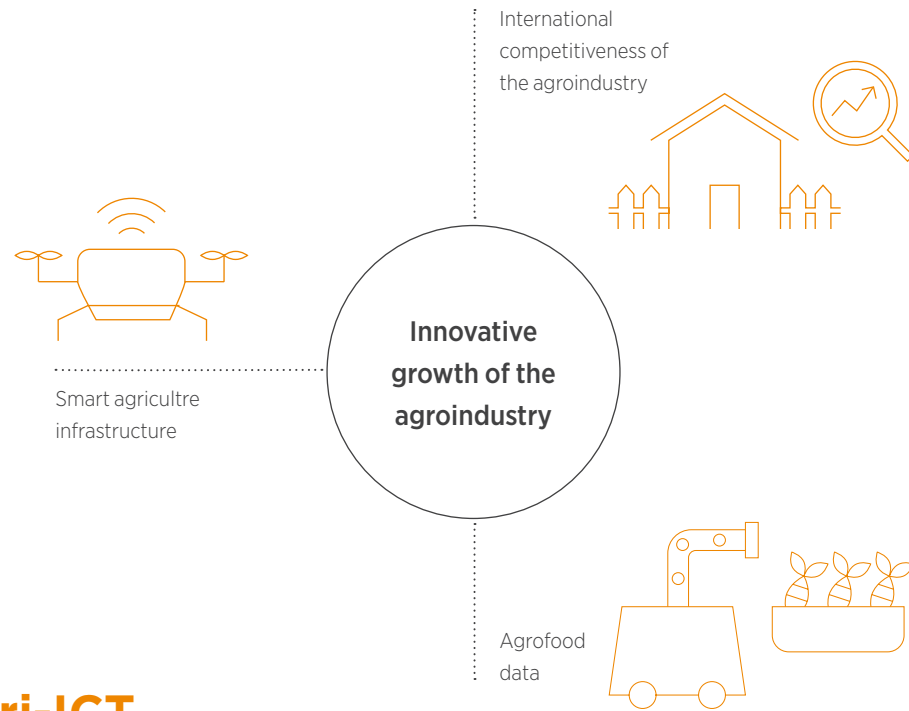
KREI is a national policy research institute dedicated to the development of agriculture, rural areas, and the food industry as a means of

helping to create agricultural policy. KREI creates solutions for new issues such as encouraging urban people to return to farming or rural areas, the improvement of the quality of rural life, and the growth of the food industry. KREI seeks to advance the development of sustainable agriculture and rural communities.



Key Innovative Technologies in Agriculture

Source: Korea Agency of Education, Promotion and Information Service in Food, Agriculture, Forestry and Fisheries



Korea's Agri-ICT Application

1. SMART FARM

Smart Farm is one of the Agri-ICT applications of Korea. It is an automated farm that provides a suitable and sustainable environment for agri-production without restriction or external factors. It provides a solution to the limitations that come with traditional agriculture by reducing reliance on resources (fertilizer, water, etc.) and enhancing productivity of quality products.

There are three type of Smart Farms:

Horticulture Environment Control

This provides automated air circulation, environment monitoring (temperature, humidity,

CO₂), nutrition supply using PC or mobile to provide ideal environment for crop production for the Horticulture Environment Control.

Livestock Environment Control

This enables automated monitoring (temperature, humidity), feeding and water supply management using PC or mobile for livestock production for Livestock Environment Control.

Smart Orchard

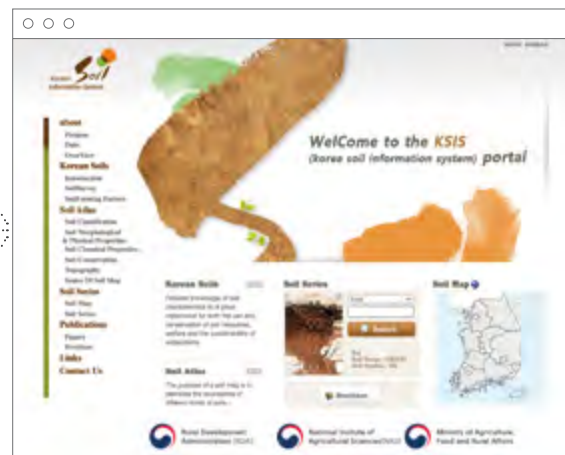
This enables automated monitoring (temperature, humidity, climate), water and disease and insect control using PC or mobile for fruit production, for Smart Orchard.

2. AGRIX

AGRIX is an integrated agricultural projects information system which provides an online service for farmers and subsidies management. It was established to prevent overlapping and biased support for agricultural subsidies, and to establish an agricultural management database with linkage

and integrated management system. This is to promote business efficiency such as management and execution of the agricultural business management process based on the agricultural management database.





Source: Rural Development Administration

3. KOREAN SOIL INFORMATION SYSTEM

The Korean Soil Information System is a web-based portal under the National Institute of Agricultural Sciences - Soil and Fertilizer Division, aimed at conserving the agricultural environment and establishing a nationwide basis for safe crop production. It provides accessible soil information to farmers, policymakers, researchers, and the general public regarding crop-suitability, soil physicochemical properties, fertilizer prescription, soil testing information, and analysis of crop nutrients.

Data featured on the system is based on soil surveys conducted by the National Academy of Agricultural Science and the National Institute of Crop Science. Soil test information covering each lot is obtained through the sampling and testing of soils by the Agricultural Technology and Extension Centers of provincial cities and Guns (district).

Soil data can be applied to map soil functional properties, soil carbon storage, and available water capacity which are essential for land and ecosystem management and plant production.

The Korean Soil Information System Portal Features ¹⁷:

- 119 layers of soil attribute information
 - 30 soil morphological and physical properties
 - 25 soil chemical properties
 - Details on crop suitability for 64 crops
- Fertilizer recommendation system for 143 crops
- Drought status and forecast information based on soil moisture
- 148 soil moisture sensing networks

4. OKDAB AGRICULTURAL INFORMATION SYSTEM

Okdab is an online publishing service for agricultural information. Okdab provides public data created, acquired and managed by a total of 19 organizations in the agriculture-food sector in Korea, including the Ministry of Agriculture, Food and Rural Affairs (MAFRA), affiliated organizations, affiliated public agencies, and research institutes. This information system produces a farming calendar and agricultural weather. It also distributes real-time auction price, market price survey, and agricultural outlook. Okdab is accessible to all users and it uses daily data period.

5. BEEF TRACEABILITY SYSTEM

Beef Traceability System tracks historical information from farm-to-table. It aims to prevent epidemics and ensure food and meat safety by recording and managing all the information about cattle, swine, etc. It tracks information at every stage (from production to consumption) to ensure that at the occurrence of a problem, prompt measures can be taken through retracing. Producers and Distributors participate in this system, and consumers can access the historical information through the internet. This promotes the efficiency of the Animal Disease Control System by recording and managing information about production, distribution and selling from farms. Additionally, this contributes to the development of the livestock industry and related industries through the prevention of false marking of origin. It also enhances the transparency of distribution systems by recording and managing all the information about distribution.

Agricultural Weather

- Temperature, rainfall, humidity, wind
- Regional real-time climate service

Farming Calendar

- For 5 main vegetables (Spring onion, Chinese cabbage, radish, spinach, chives)
- Related publications service

Real-time Auction Price

- Bidding information
- Bidding price
- Bidding price analysis for each wholesale market

Market Price Survey

- Wholesale price
- Retail price
- Imported price (Others)
- Imported price (China)

Agricultural Outlook

- Intention to cultivate
- Sow/crop condition
- Harvest estimated

Distribution

Production



Okdab

- Accessible to all users
- Data backup and monitoring
- System maintenance
- Daily data period

Source: Korea Agency of Education, Promotion and Information Service in Food, Agriculture, Forestry and Fisheries

Site Visits and Locations

Source: Rural Development Administration



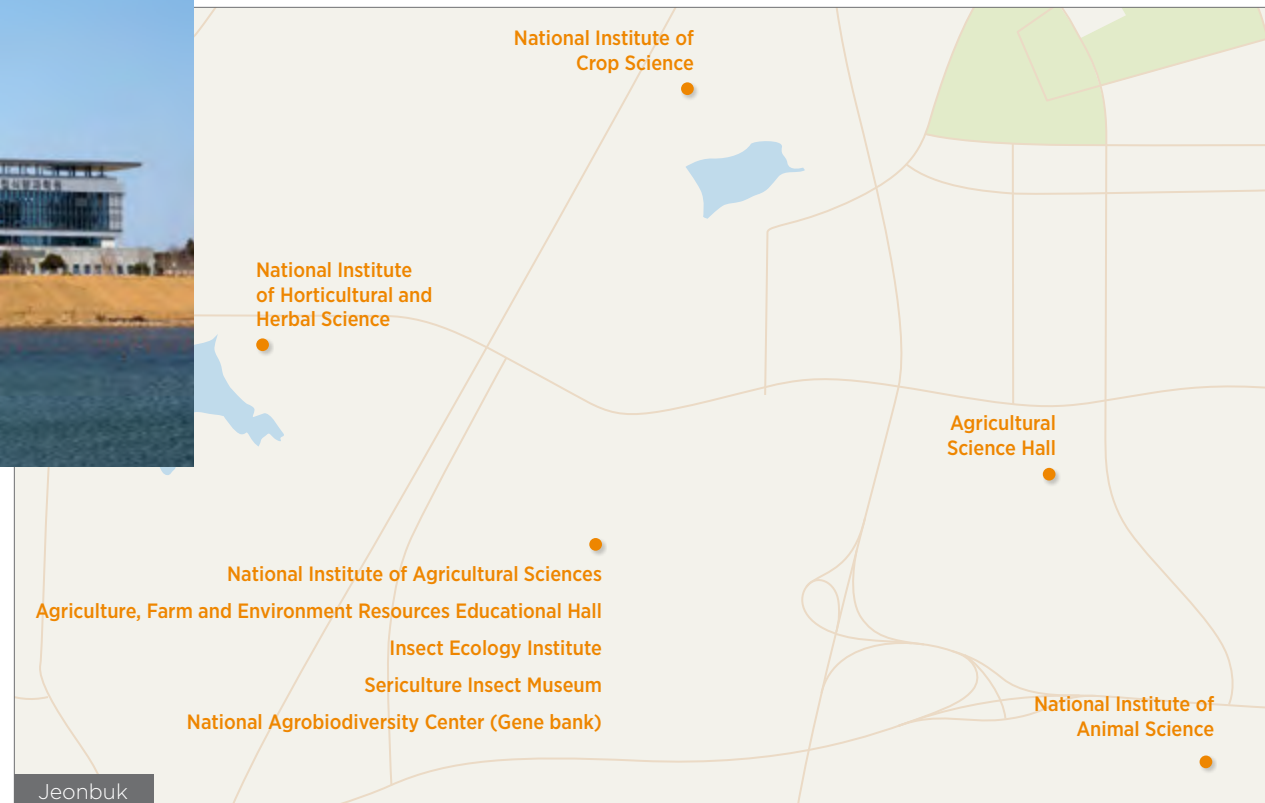
National Institute of Crop Science
The National Institute of Crop Science leads crop research to increase quality, profit and production by developing new varieties and production technologies. The institute is responsible for establishing environment-friendly farming technologies and providing farmers quality seeds and information on growing their crops.



National Institute of Horticultural and Herbal Science
The National Institute of Horticultural and Herbal Science is responsible for horticultural and herbal research services in Korea. The institute focuses on developing efficient and environment-friendly production systems using strategies that include the promotion of technological convergence in information and communication technology (ICT) and biotechnology (BT).

Agricultural Science Hall

The Agricultural Science Hall presents historical information on Korea's agricultural science and technology. It was established to educate the public on the importance of agriculture and promote Korea's agricultural vision. The Contemporary Agriculture Hall, Future Agricultural Hall, Children's Experience hall the 4D video room are also open to visitors.



National Institute of Agricultural Sciences
The National Institute of Agricultural Sciences provides various research and development functions across the country guided by national agricultural directions. It consists of 6 departments that execute several roles including generating new income, commercialization, management and various aspect of technical development.



Agriculture, Farm and Environment Resources Educational Hall
The Agriculture, Farm and Environment Resources Educational Hall was established to present Korea's ongoing research in agriculture and rural tourism while highlighting the value of farming and rural development. It provides a special display designed to showcase Korean soil.



Insect Ecology Institute
The Insect Ecology Institute provides important information on insect environmental conditions and the relationship between insects, plants and ecology. The institute has secured over one hundred insect species and two hundred insect feeding plants.



Sericulture Insect Museum
The Sericulture Insect Museum provides the history of sericulture technology development. It presents over a thousand articles related to sericulture and related insect species. It features experience halls for visitors to explore silk production.



National Agrobiodiversity Center (Gene bank)
The National Agrobiodiversity Center distributes genetic resources and related information to the public and private sectors. Most recently, the center is focused on securing diverse agricultural genetic resources related to 'Low Carbon and Green Growth'. The center is also focused on strengthening its international relations to facilitate the exchange of genetic resources and information.



National Institute of Animal Science
Then National Institute of Animal Science was established to develop technologies that can be used to respond to changing environments. The institute provides research services that include the development of livestock technologies using information and communication technology (ICT), creation of self-sufficiency of forage, and improving breeding stock productivity, etc. It also supports the development of livestock policies and actively develops practical technologies for onsite use.



Gunsan-Si Agricultural Product Processing Center

Agricultural Product Processing Center was established to create and manage cycle systems for the consumption of local agricultural products. The center provides several services that include:

- Development of processing technology for locally processed agricultural food, commercialization of locally processed agricultural food, and support for quality improvement technology.
- Support for modernizing facilities and agricultural food processing start-ups.
- Improved sanitation, reinforced processing equipment, support for distribution of processed products, and support for HACCP certification and consulting.



Gunsan-Si



Gimje-Si



Namwon-Si

Gimje-Si/ Gunsan-Si/ Namwon-Si Agricultural Technology Center

Agricultural Technology Center has 5 divisions that include Agricultural Policy, Food Distribution, Livestock Promotion, Rural Support, Technology Dissemination. These divisions conduct tasks that include:

- Dissemination of R&D achievements by the Rural Development Administration (central) and the Agricultural Technology Institute (District).
- Ensuring sustainability by building farmers' competencies and cultivating young farmers' organizations.
- Resolving difficulties for farmers through scientific farming support and on-site consulting.
- Promoting new technology development projects by the Rural Development Administration.
- Providing scientific farming technology support such as fertilization prescription through soil test, propagation of tissue germ linear, propagation of microorganisms for agriculture, and agricultural machinery rental service.



Korea National College of Agriculture and Fisheries

Korea National College of Agriculture and Fisheries is a three-year national university opened in 1997 with the purpose of nurturing youth agriculture and fisheries successor. It operates a practical-oriented curriculum with 18 departments. 4,733 students have graduated, and 85.9% of total graduates have settled in farm and fishery household (based on Feb 2018 data). In addition, the institution promotes industry-academia cooperation in addition to education and training.



Smart-Farming Farm (Udeumji)

Located in Chungcheongnam-do, Smart Farming Farm produces tomatoes, paprika, strawberries, and melons, and is managed through Enterprise Resource Planning (ERP) system. Its major facilities include Environment control system, Hydroponic cultivation facility, Triple screen, Rack-Pinion sky opening / closing system, Air heat pump, Liquefied carbon dioxide and fog system, Electric rail car, Automatic harvesting transportation car etc. It also uses an automatic screen and ventilator that operates based on data collected by Nutrient solution control to measures solar radiation quantity, temperature, humidity, and wind direction and wind power.



Jeollabuk-do Agricultural Research & Extension Services

Agricultural Research & Extension Services is an institution that performs several major roles that include:

- Planning, researching and disseminating rural development projects.
- Improving farmers' income by finding and commercializing special crops in regions.
- Improving competitiveness by dissemination of on-site technology.
- Developing strategies to adapt to climate change and establishment of a preventive system for pest management.



Agriculture Products Distribution Center

Agricultural Products Distribution Center is an institution focused on sorting and distribution. The center sorted 7,430 tons with sales of USD 11.5 million in 2017. It has the capacity to screen 9,000 tons per year and 90 tons per day. It cooperates with RDA in technical support and formed a joint-work group to improve capacity. RDA supports the center in systematization, marketing activities, and support for packaging, harvesting, managing pesticides and plastic bags.

PART 5



Annex: Sources and Links

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KREI 한국농촌경제연구원



KGTF is committed to sharing technical knowledge and first-hand experience of implementing integrated green growth solutions that contribute to sustainable development and shared economic prosperity.

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