WORLD BANK GROUP | KOREA GREEN GROWTH TRUST FUND | Ministry of Economy and Finance

KGID 2025 Green Growth: The Path to Sustainable Jobs

Innovative Strategies to Smart Agricultural Infrastructure for Climate Change Adaptation and Low-Carbon Growth

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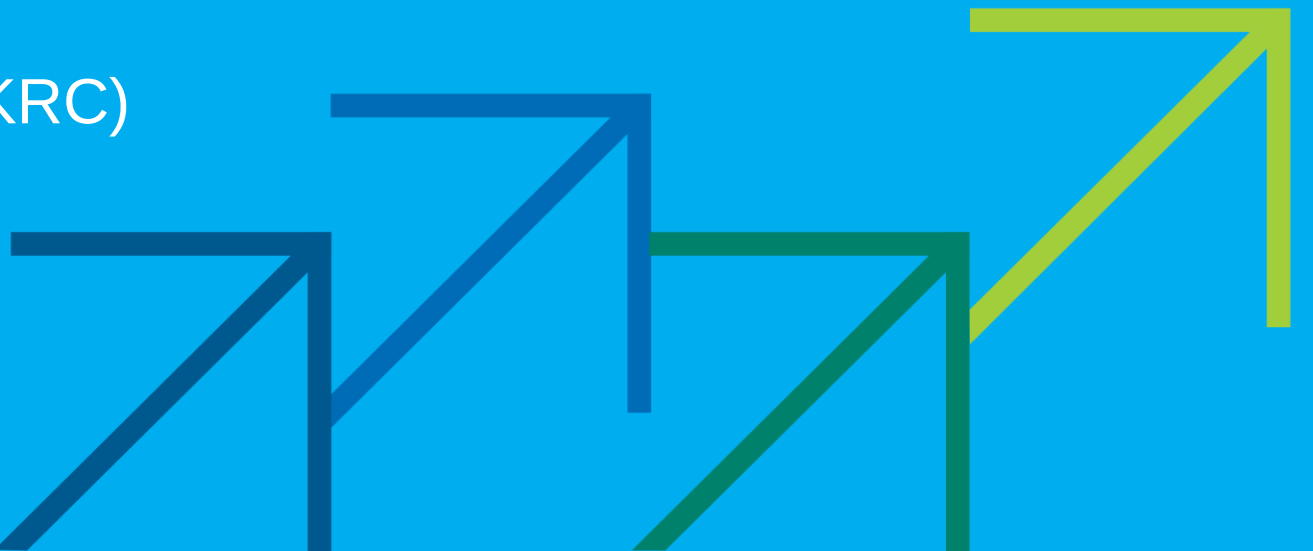
Korea Rural Community Corporation(KRC)



Contents

Korea Rural Community Corporation

Chapter 1

Introduction

Korea Rural Community Corporation (KRC)

KRC Since 1908, Korea Rural Community Corporation(KRC) has been striving for the happiness of farmers and fishermen, and better future for rural community

Modernization of Agricultural Infrastructure

- Food Security
- Safety
- Infrastructure

- Rural resource
- Welfare
- Environment

Water resources development & management

- Clean
- Efficient
- Eco-friendly

- Competitiveness
- Education
- Farmland Bank

Promoting the value of rural areas

Increase farm income & strengthen competitiveness

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Korea Rural Community Corporation (KRC)

Public Entity — Under the Ministry of Agriculture, Food, and Rural Affairs

Organization — 5 Divisions, 23 Offices, 3 Institutes, 9 Regional Headquarters
93 District Offices, Safety Inspection Headquarters, 7 Project Offices

Staff/Budget — 6,143 employees
$ 4.6 billion USD as of 2024

History — Founded in 1908

Location:
Naju, Jeollanam-do, Korea

Major Projects — Agricultural infra structure, Rural water management, Farmland Banking Initiative & Rural Community Vitality Promotion

Managing Area — 500,000 ha

Water Resources Facilities (13,911point)

Reservoir	Seawall	Pumping Station	Weir
3,403point	144point	4,473point	5,891point




Irrigation structure (102,000km)

Circumference of the Earth x 2.5

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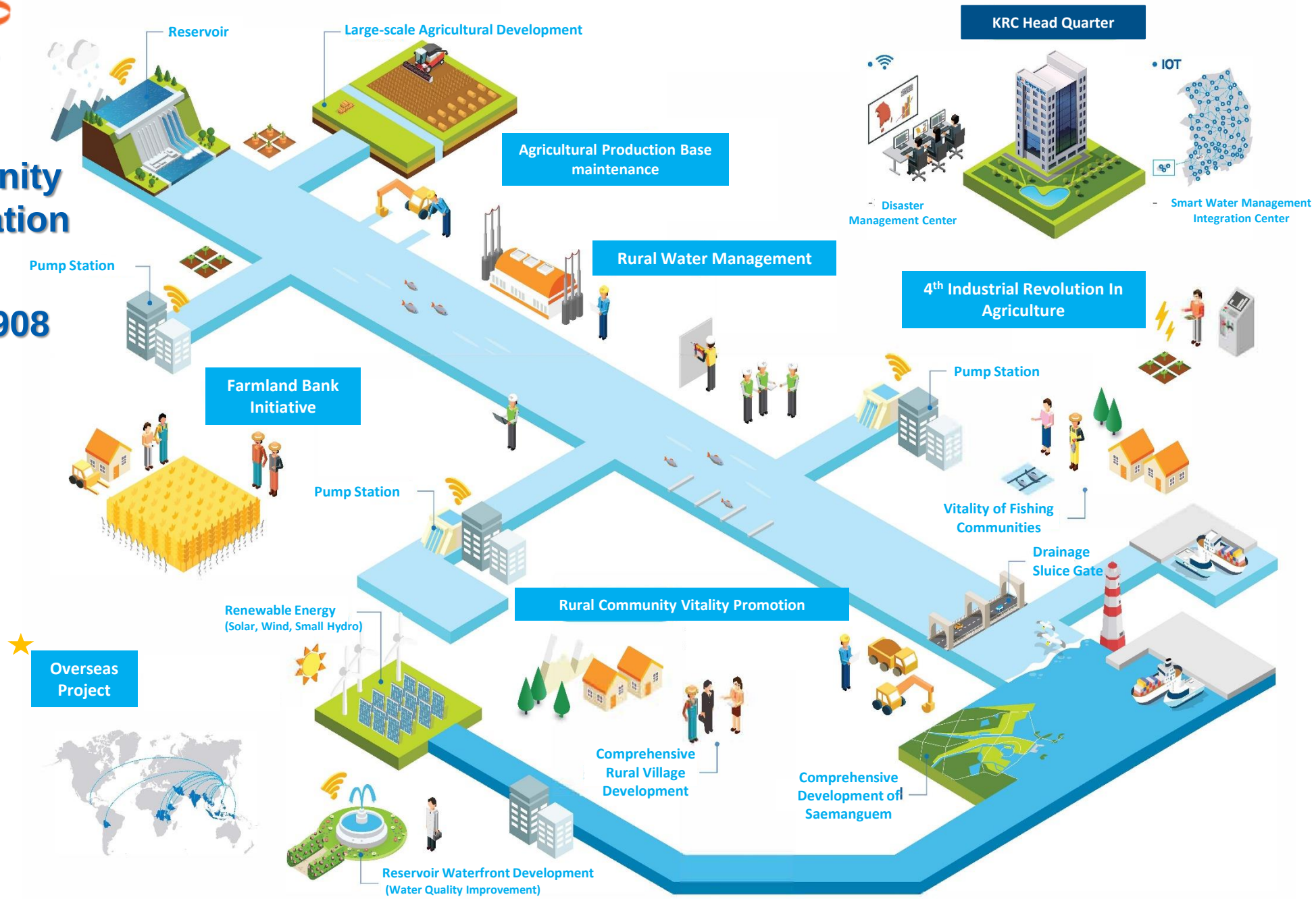
Korea Rural Community Corporation (KRC)

Since 1908



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KRC shares Korea's experience in agricultural and rural development with the world

MAFRA & KRC

International agricultural cooperation project(ODA)

Government policy project

Duration

2011~Present

Result

60 projects ended in 17 countries in Asia and Africa, etc.

F/S, DD, CS, O&M

Overseas technical consulting project

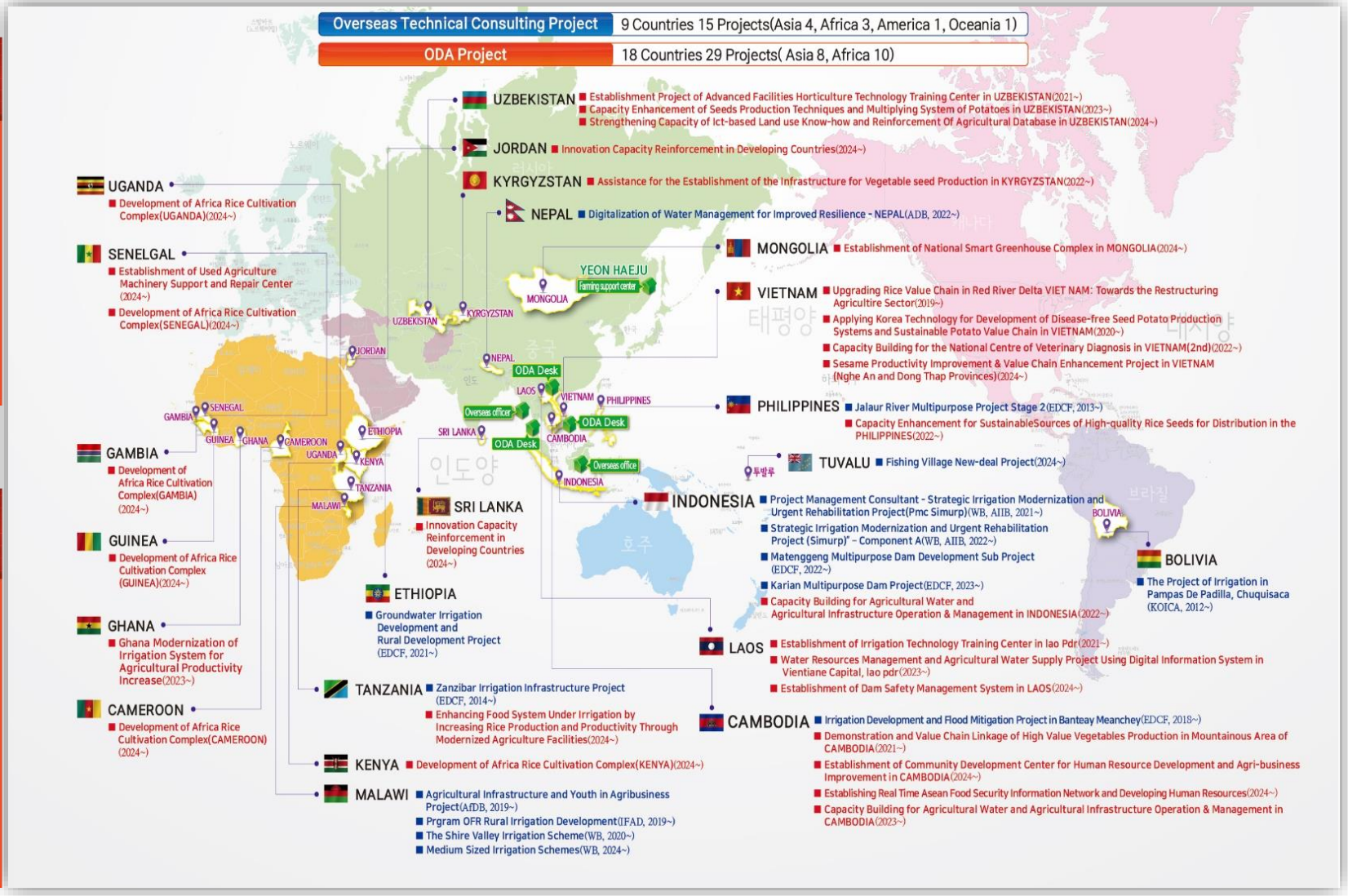
Technical service support

Duration

1967~Present

Result

166 projects in 36 countries (27 projects in 8 countries with WB)



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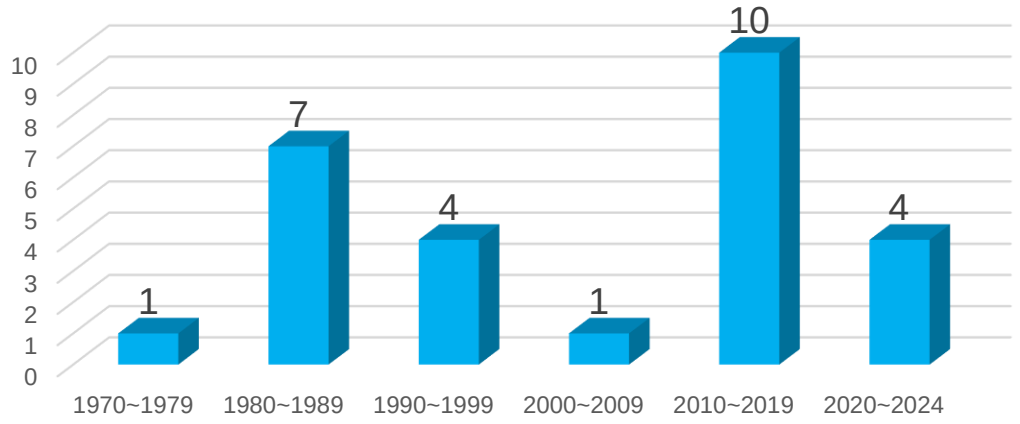
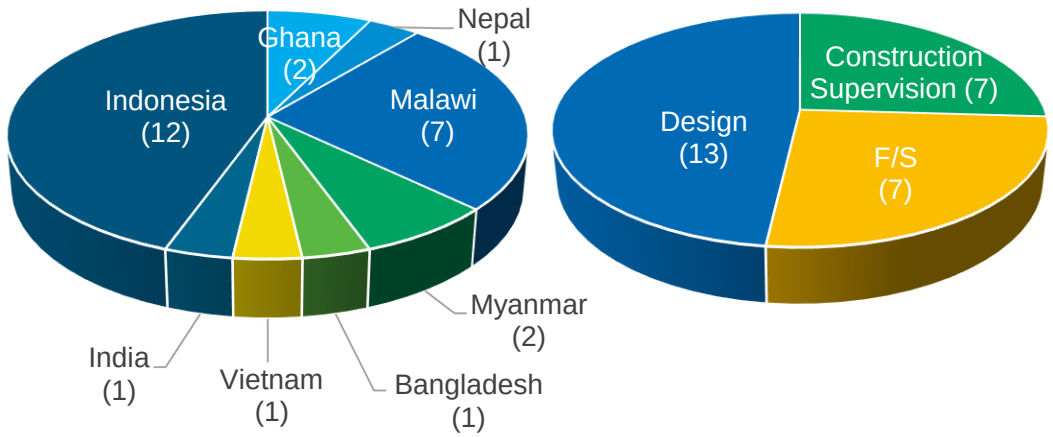
KRC has been working with WB since 1978

Technical Consulting Project

Area Irrigation, Drainage, Rural Development, etc.





International Cooperation

Flowchart for Multi-bilateral ODA

(~N-2)	(N-1)	(N~)
* PCP Review * Select Candidate	* Project Confirm * Budget	* Announce * Start Project

WB project list for 2027

- ✓ Mozambique: Enhancing Small-Scale Irrigation and youth Empowerment for Sustainable Agriculture
  (’27~’30, 2 mil USD)
- ✓ Smart Farming for Agricultural Development in the Caribbean: Demonstrative Farms in Jamaica and Belize
  (’27~’29, 1.5 mil USD)
- ✓ Panama: Enhancing the productivity, resilience and inclusion of rice and livestock smallholders
  (’27~’28, 1.4 mil USD)

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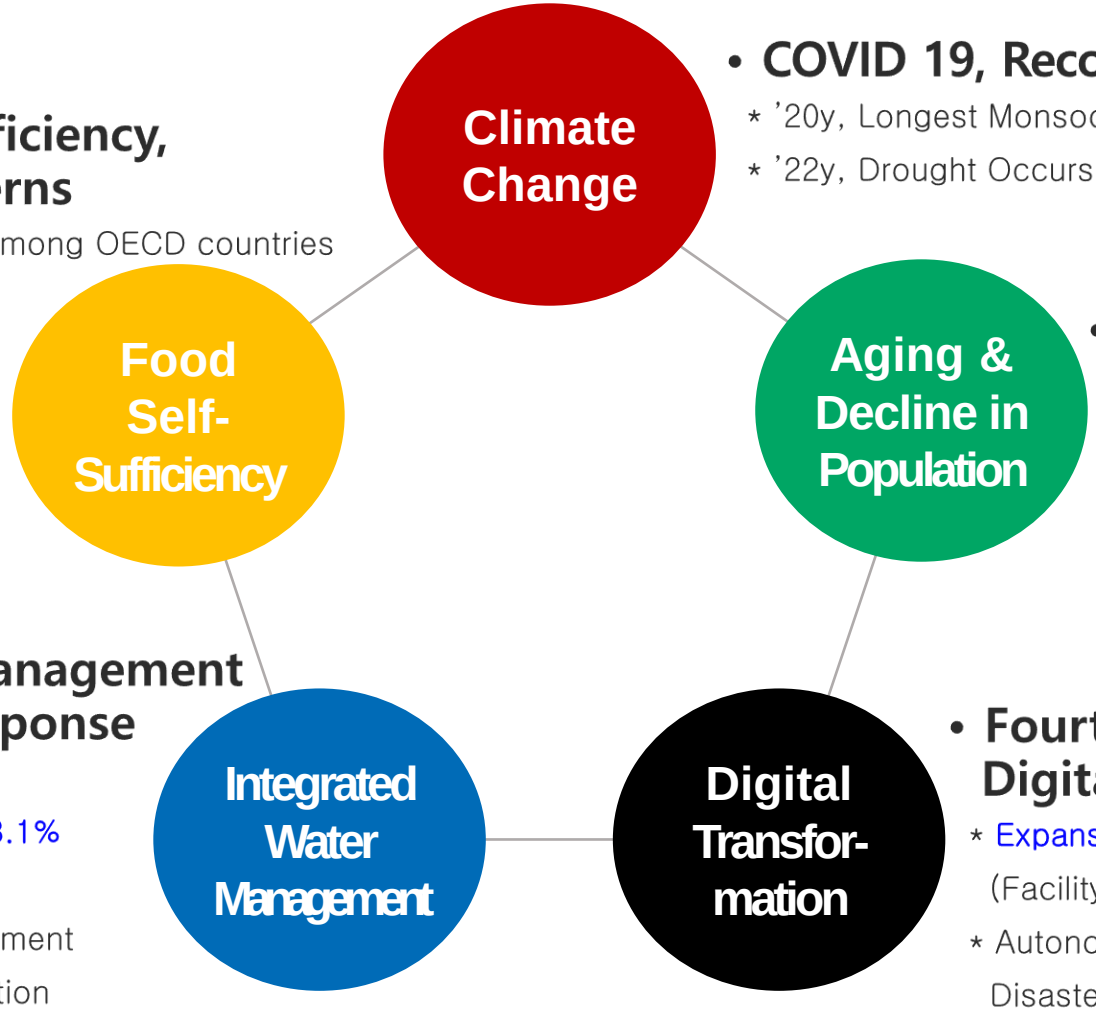
Chapter 2

Innovative Strategies to Smart Agricultural Infrastructure for Climate Change Adaptation & Low-Carbon Growth

Ministry of Agriculture, Food and Rural Affairs

Korea's Issues on Agriculture & Rural Area



- **Decline in Food Self-Sufficiency, Changes in Dietary Patterns**
  - Cereal self-sufficiency ranked 32nd among OECD countries (38 countries in total)
  - Decline in Rice Consumption ('84y 130.1kg → '24y 55.8kg (↓57%)

- **COVID 19, Record-breaking monsoon and drought**
  - * '20y, Longest Monsoon Seasons Occur : 54days
  - * '22y, Drought Occurs in 63 Out of 159 Municipalities (40%)

- **Decline in Agricultural Population and Shortage of Agricultural Labor Force**
  - * (Agri Population) '15y 2,569K→'24y 2,004K(↓22%)
  - * (Aged 65 and up)'15y 38.4%→'24y 55.8%(↑17.4%)

- **Efficient and Rational Management of water resources in response to water scarcity**
  - * Agricultural water use accounts for 63.1% of the total national water resources
  - * Integrated watershed-based management for the rational utilization and distribution of water resources

- **Fourth Industry Revolution, Digital Transformation**
  - * Expansion of Smart Farming (Facility-based → Open-field)
  - * Autonomous Farming Machinery, Disaster Prediction, Robotics, AI, and other advanced agricultural technologies

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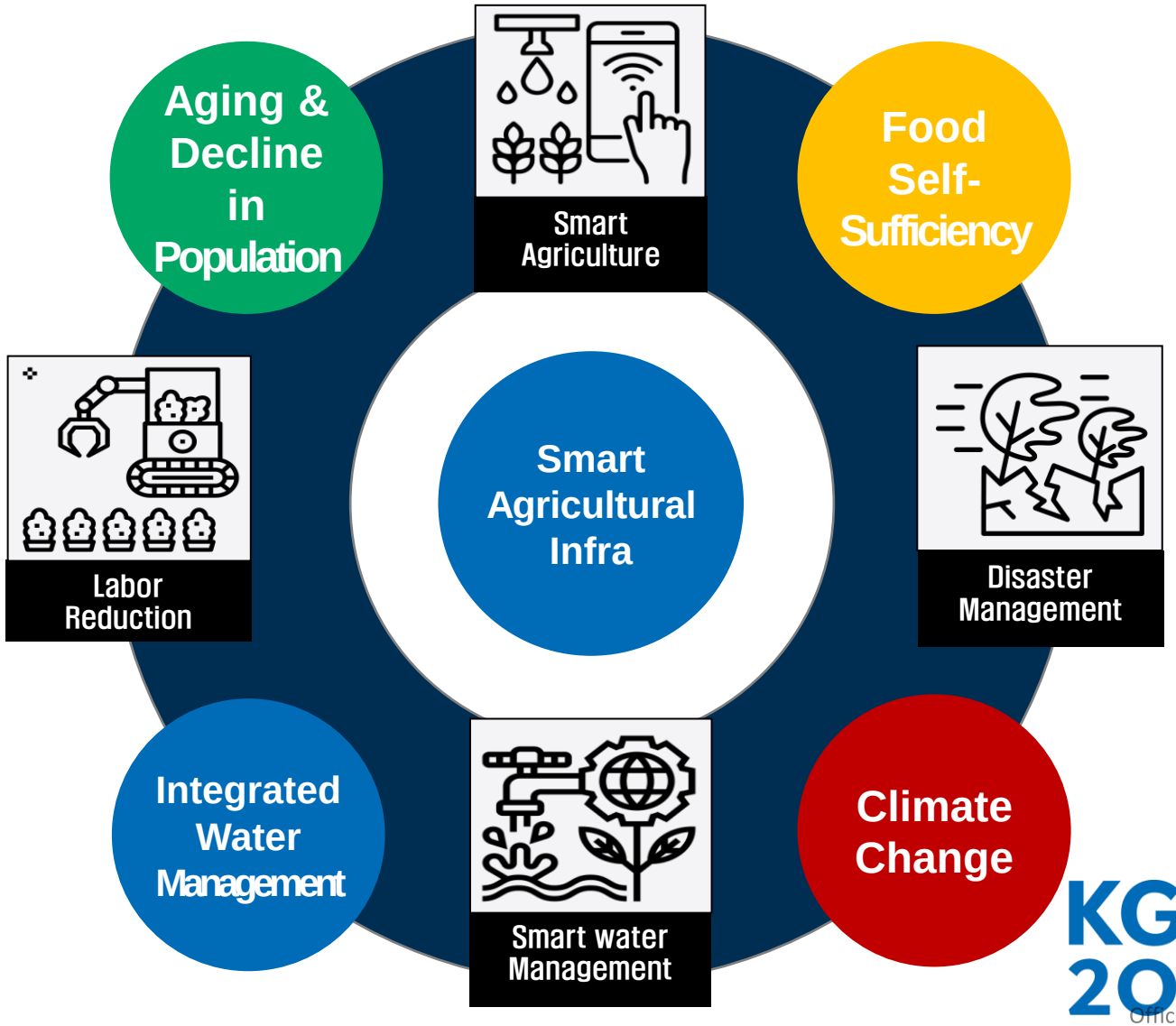
The solution in terms of agricultural infrastructure is???

- ✓ Smart Agriculture
- ✓ Disaster Management
- ✓ Smart Water Management
- ✓ Labor Reduction



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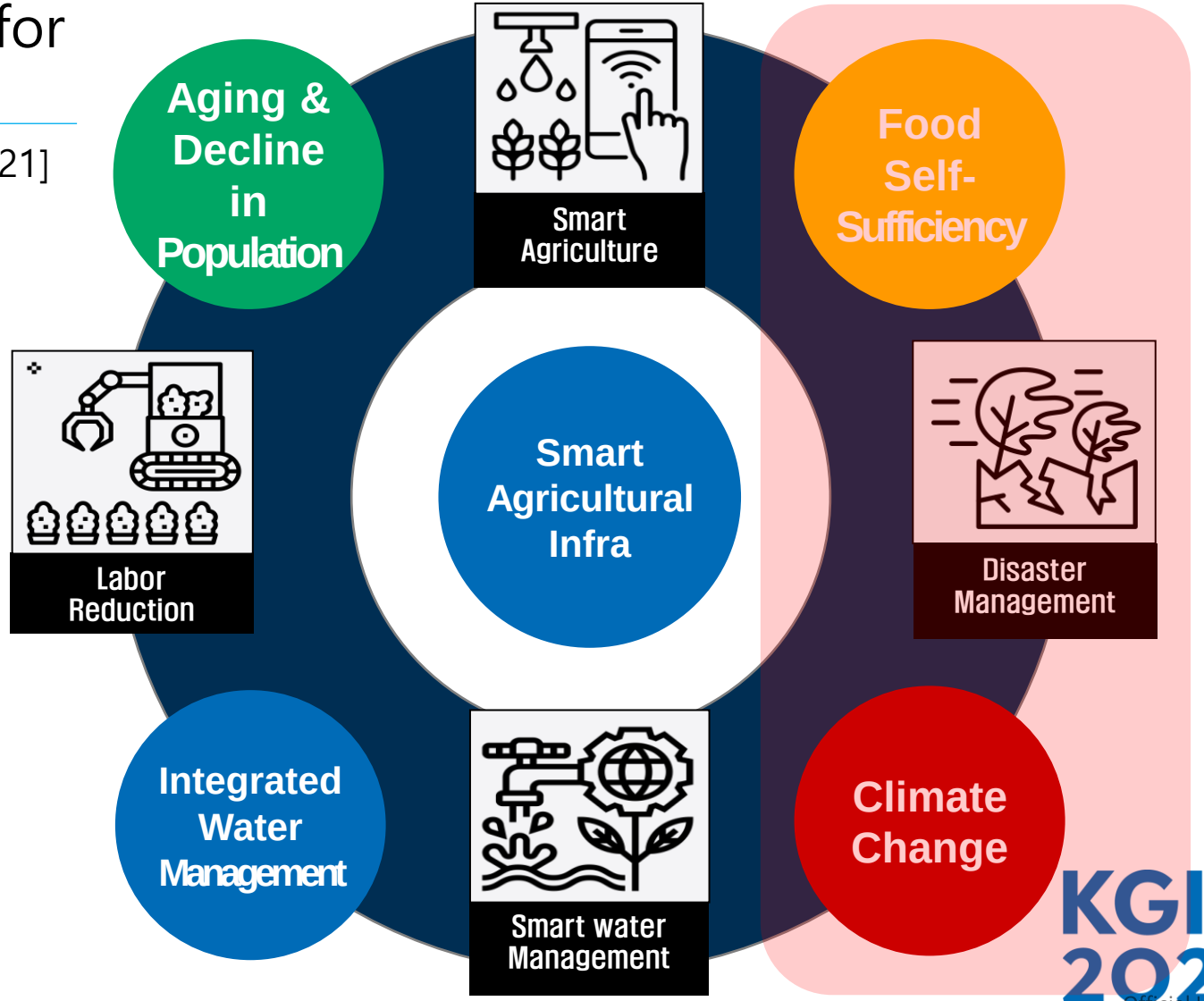
Ⅰ. Disaster Management

Vision Expansion of Infrastructure for Low Self-sufficiency crops

* Bean(23.7%), Wheat(1.1%) etc. [As of 2021]

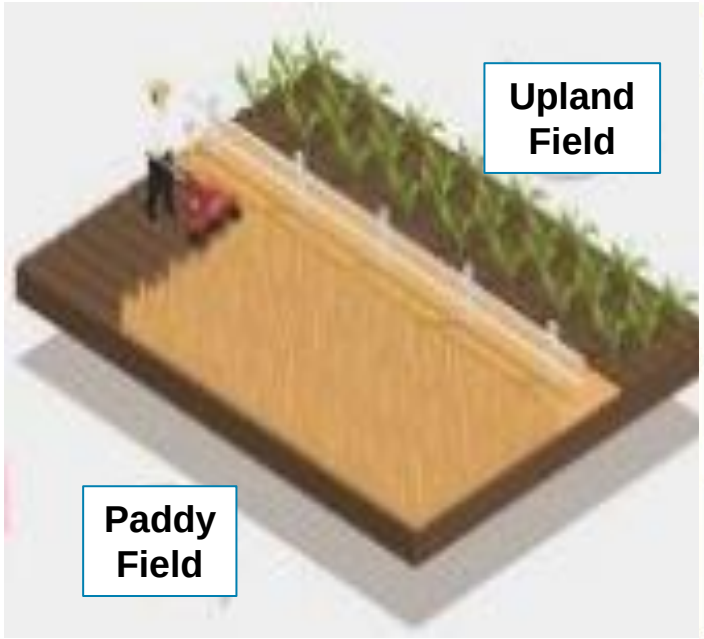
Disaster Management

	As - Is	To - Be
Target	RICE	Multi Crops
Drought	Dam, Reservoir development	Securing Water Resources through Improvement of water supply System
Flood	Exclusion of paddy field flooding	Exclusion of paddy field and farmland flooding



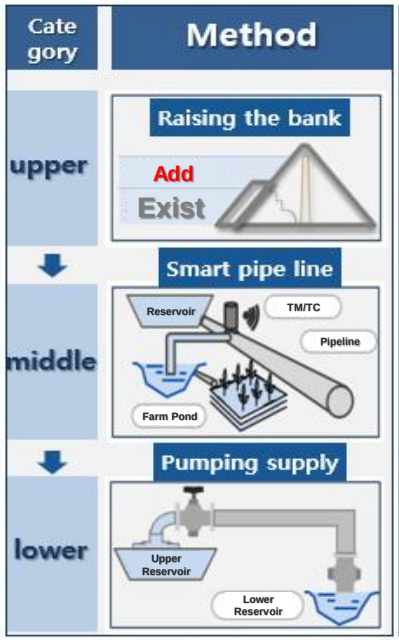
Ⅰ. Disaster Management

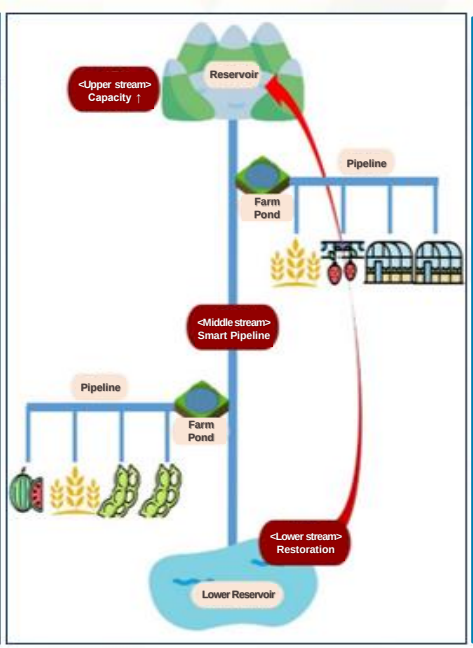
Farmland



Multiple-Purpose Utilization of Paddy Fields

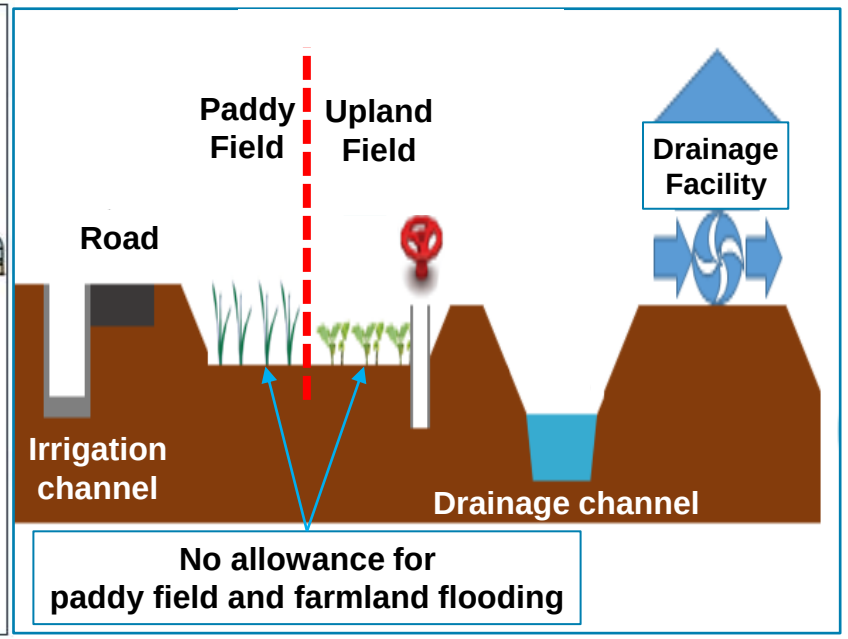
Drought





Securing Water Resources through Improvement of water supply System

Flood



Construction of a drainage system for multi-crop cultivation in paddy field

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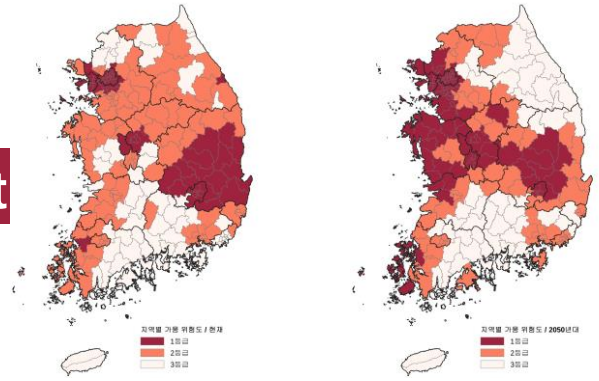
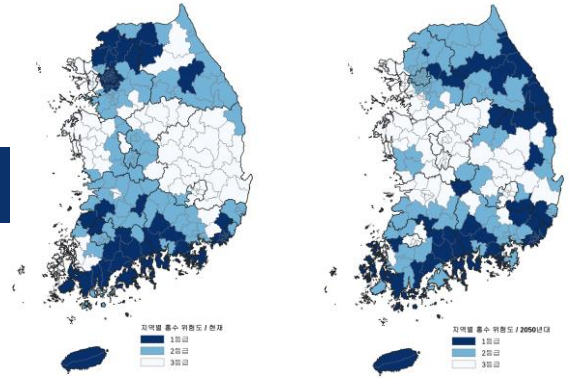
Ⅰ. Disaster Management

Vulnerability Assessment

Drought



Flood



NOW(2011-2021) 2050(2050-2059)

Design Standards

- ✓ **Standard of Water Supply**
  ≥ 10 year return period drought
- ✓ **High vulnerability site**
  → Apply of future forecast data
- ✓ **Standard of design flood**
  → Apply of future forecast data
- ✓ **High vulnerability site**
  → Project priority, EAP, etc.

Agricultural Weather Database

Weather Data	Impact Data
Annual avg. daily temp	Standard evapotranspiration
May-Sep avg. temp	Annual avg. effective rainfall
Annual avg. rainfall	Required water quantity of Paddy field
Valid rainfall (above 5mm)	Required water quantity of Upland field
Max number of consecutive rainless days (Less than 5mm)	
May-Sep avg. rainfall	
Jan-Apr, Oct-Dec rainfall	
Number of rain days (include 0.0mm)	
Number of rain day above 80mm	
1 day Max rainfall	
5 days Max rainfall	

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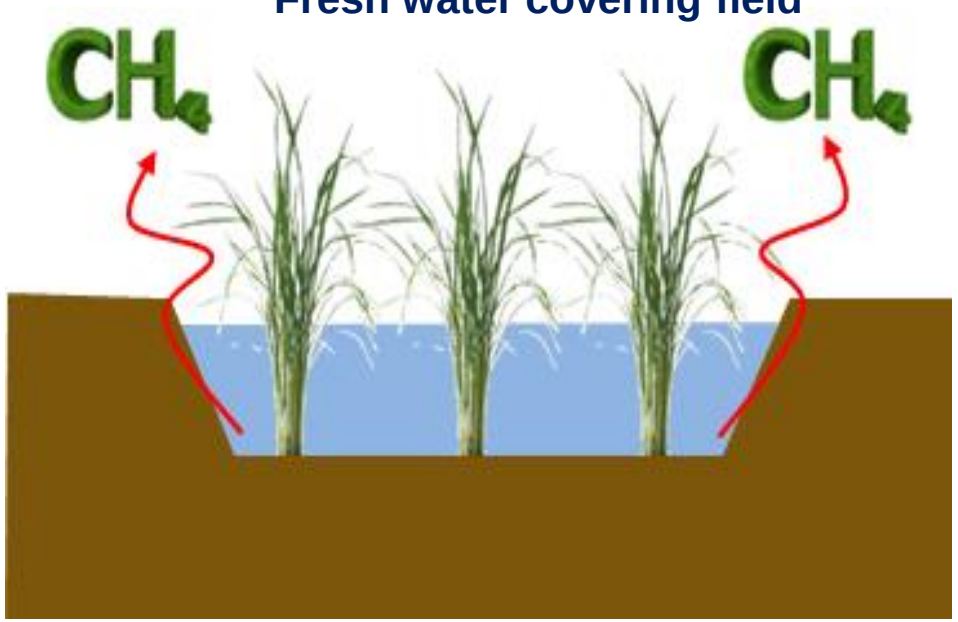
Ⅰ. Disaster Management

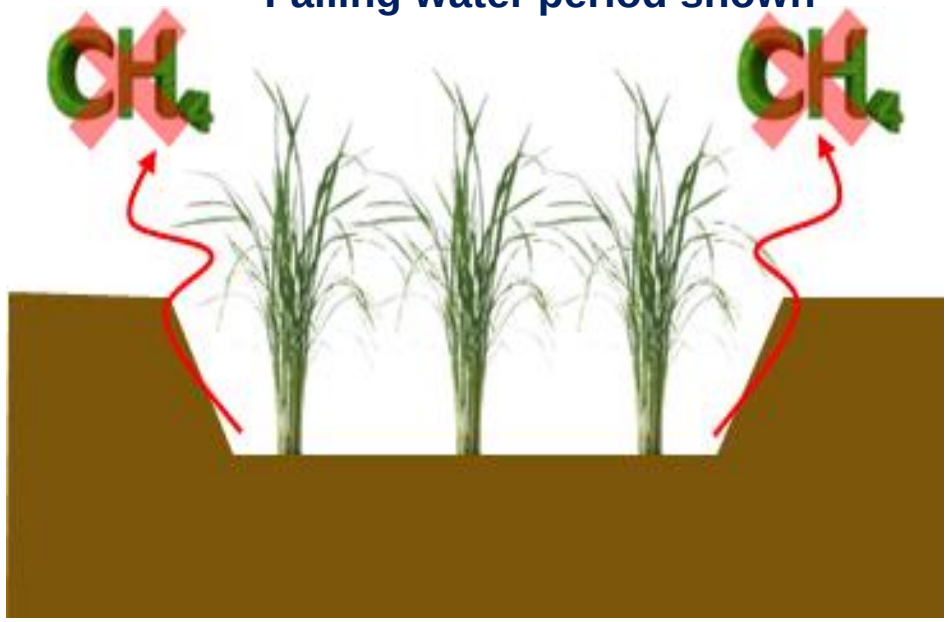
Methane Mitigation Project with GGGI

AWD(Alternate Wetting and Drying) application model

(Pic 1) Always-flooded paddy field
Fresh water covering field



(Pic 2) . AWD-applied paddy field
Falling water period shown



- **Organic decomposition constantly produces methane**
- **AWD extends dry period, suppressing organic decomposition.**

AWD can reduce methane emissions from rice paddies by 30-70%

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Ⅰ. Disaster Management

Water Restoration Project

Korea Rural Community Corporation + SAMSUNG

NEED

Establish a water resource supply plan that suits the characteristics of water deprived areas

NEED

Achieve the goals of eco-friendly management strategies in water conservation practices

PLAN

Develop a project to return water to water-deprived areas such as islands in proportion to the amount of water used by the company

Project History

(2022) MOU between KRC-Samsung for Water Restoration Project

(2023) 1st step of the Project in Korea

(2024) 2nd step of the Project in Korea

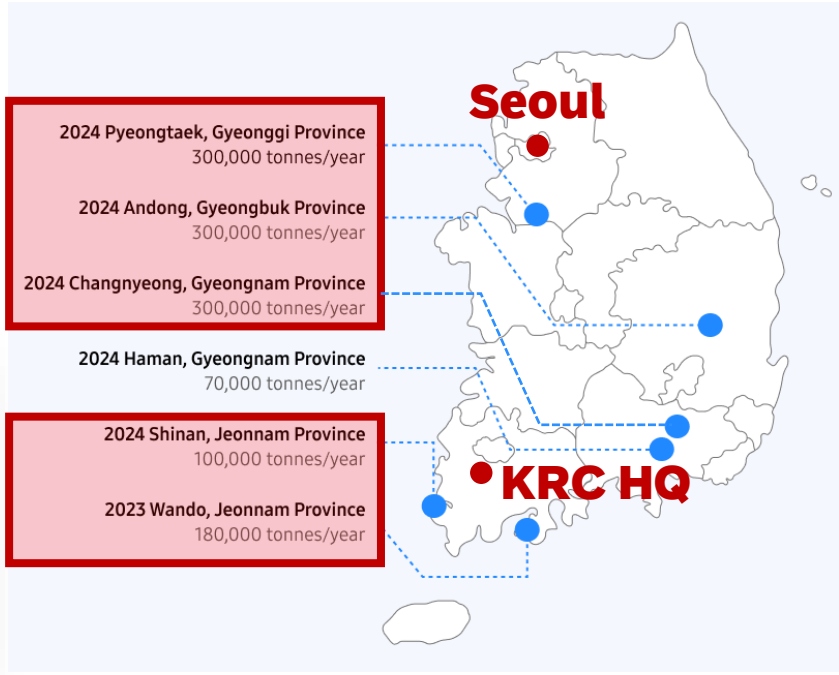
Project Site in Korea

(2023) 2 Projects in Jeonnam Province(Islands)

→ Water Restoration from Channel to Reservoir

(2024) 3 Projects in Gyeonggi&Gyeongbuk &Gyeongnam Province

→ Water Restoration from Channel to Channel



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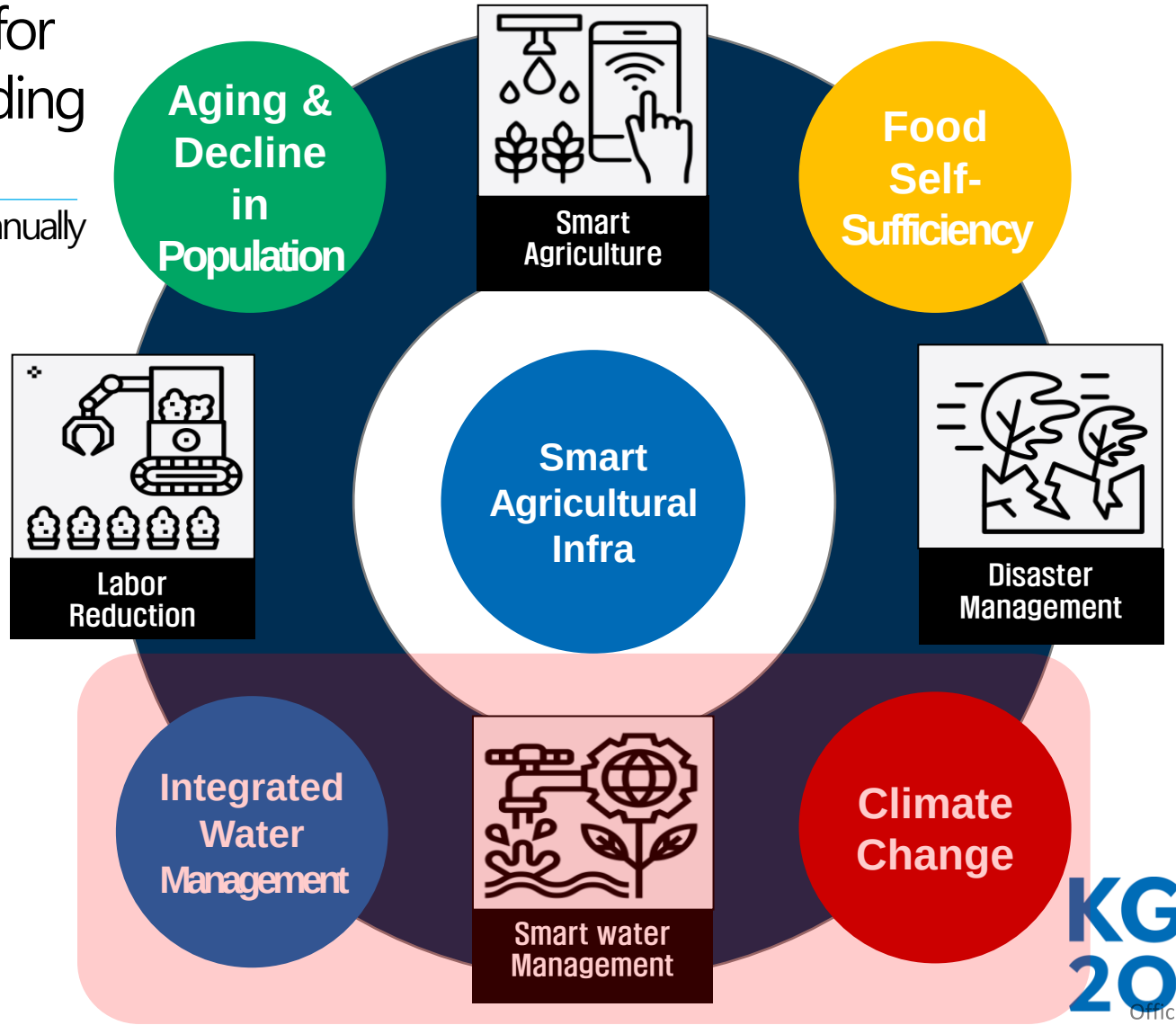
Ⅱ. Smart Water Management

Vision Integrated water management for addressing Climate Crises, including *Extreme drought

* Drought Occurrence Cycle : Average 5~7years → Annually

Smart Water Management

	As - Is	To - Be
Target	Securing new water resources	Resolution of water use imbalance
Project	Dam, Reservoir	Integrated water system and management
Type	Single water system	Smart Water Grid



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Ⅱ. Smart Water Management

Water resources in Korea

* Excluding environmental water use

	63%	37%	
Water use	**Agriculture**	**Domestic & industrial**	**Hydro-power**
Authority	Under Ministry of Agriculture, Food & Rural Affairs	Under the Ministry of Environment	Under the Ministry of Trade, Industry, and Energy
Agency	**KRC**	**K-Water**	**KEPCO**
Objectives	Improve agricultural productivity, enhance rural living, contribute to food security	Secure stable water supply for domestic and industries, efficient water resource use	Secure stable electric power supply for nationwide
Main role	• Development and supply of agricultural water • Land reclamation and irrigation facility management	• Supply of domestic and industrial water (municipal & regional) • Comprehensive river basin management	• Electric power generation, transmission & distribution • electric power projects including hydro, nuclear, thermal, renewable energy.

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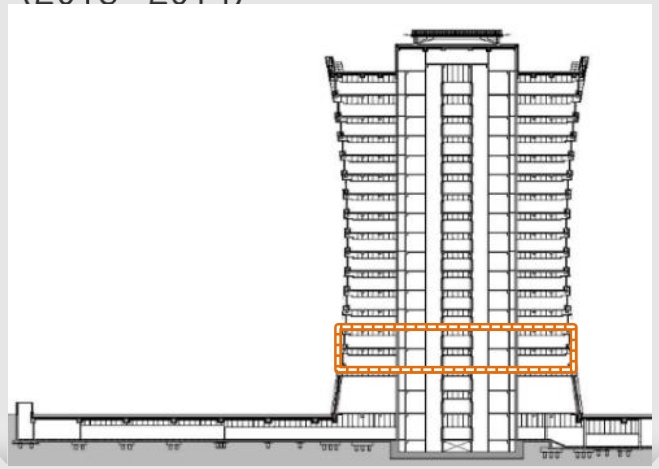
Ⅱ. Smart Water Management

Comprehensive Water Resources Management System

1st phase (2011~2014)
Establishing a control tower for water management

- Establishing a master plan for water resources management system
- Relocating to a new building in Naju (2014)
- Establishing a comprehensive water management situation center (2013~2014)

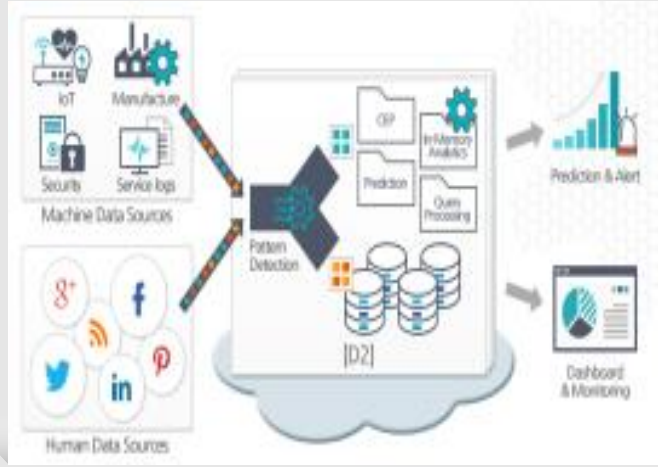


2nd phase (2015~2018)
Developing a smart water management system

- Establishing an informatization strategy for a comprehensive water resources management system
- Developing the comprehensive water resources management system
- Expanding the public services

3rd phase (2019 ~ 2020)
Stabilizing water resource Informatization system

- Establishing a decision-making support system based on big data
- Implementing quantitative, scientific and systematic water management



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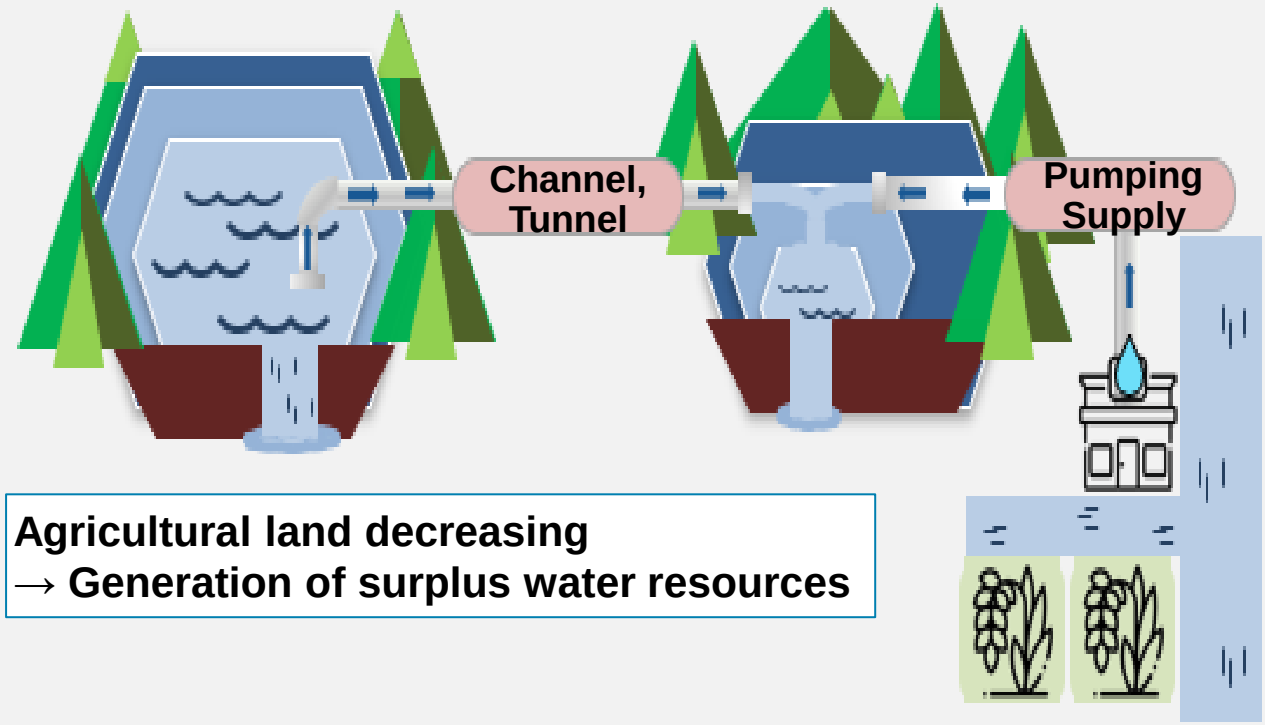
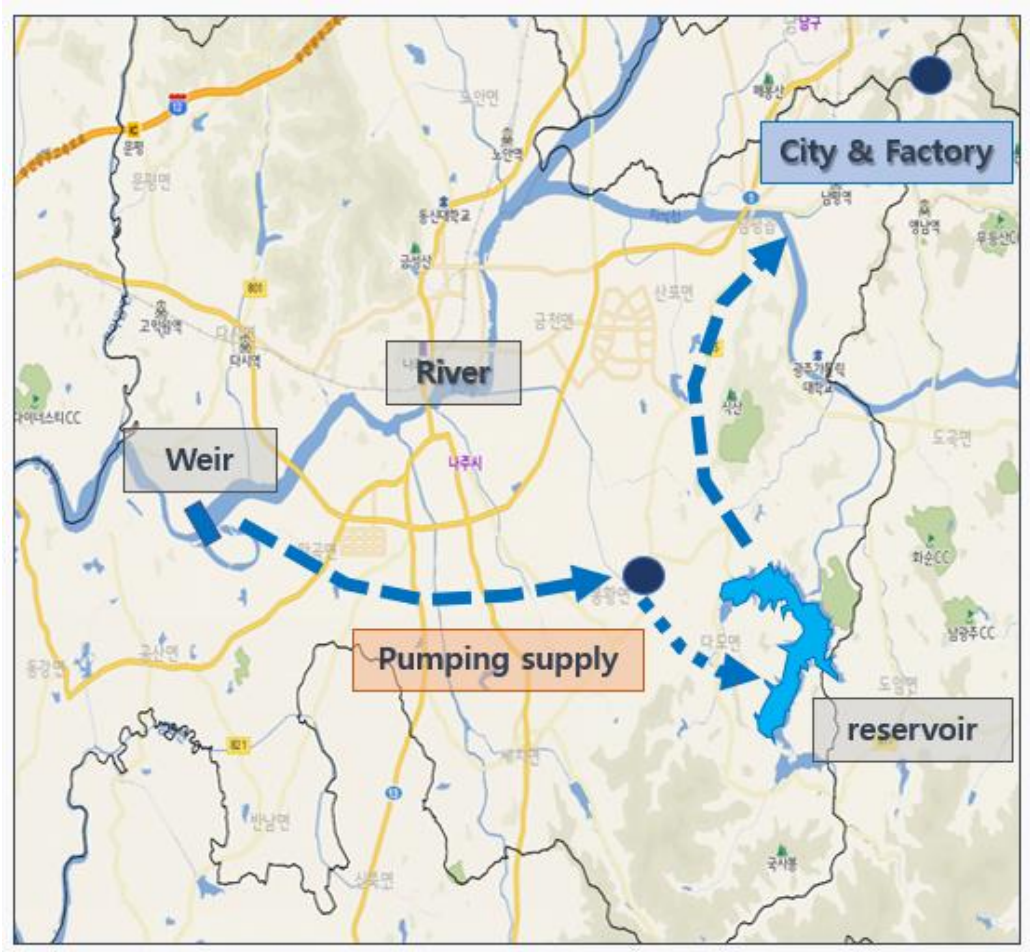
Ⅱ. Smart Water Management

Smart Water Grid System

Abundant water resources | **Insufficient water resources**



Agricultural land decreasing
→ Generation of surplus water resources



Adoption of Smart Water Grid system to solve interregional water utilization imbalance

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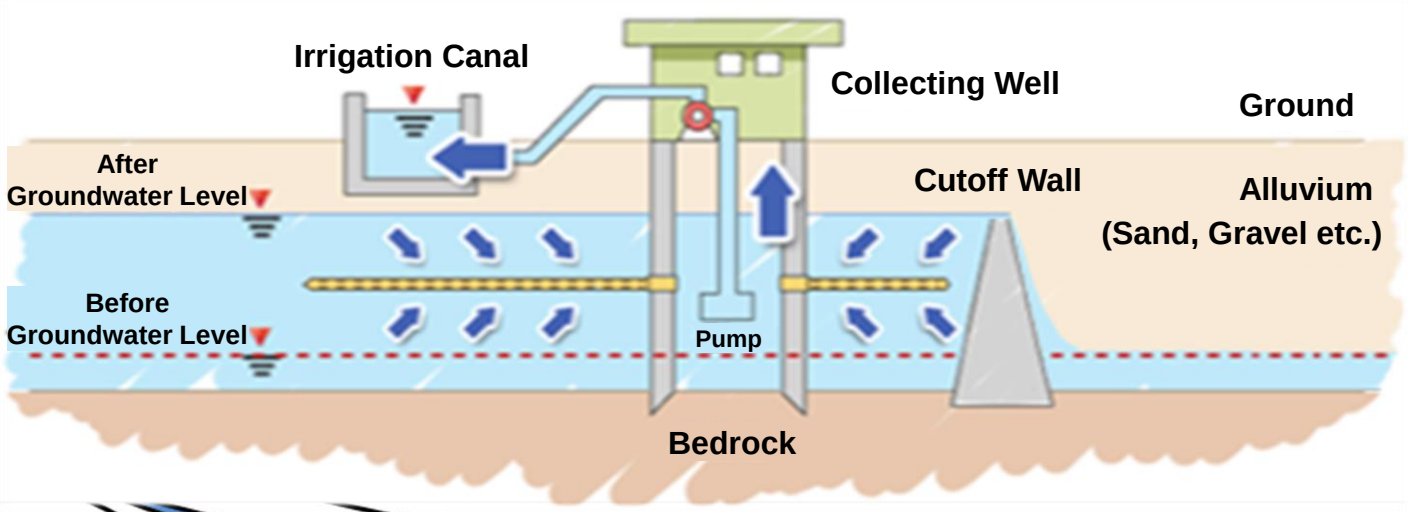
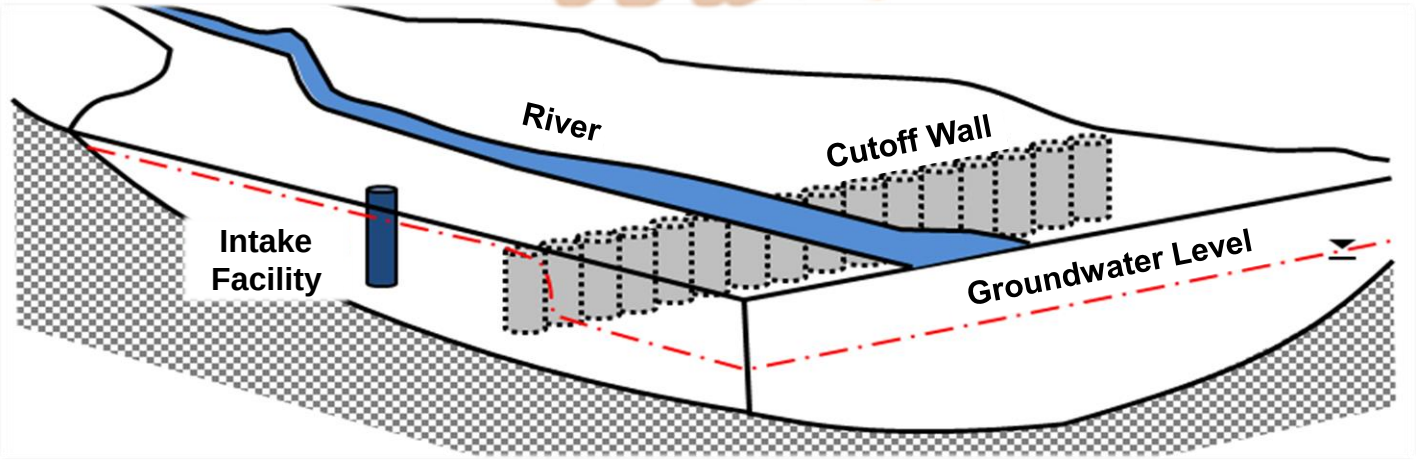
Ⅱ. Smart Water Management

Underground Dam

A type of dam to secure underground water volume
by installing an artificial cutoff wall underground to raise the groundwater level



Underground Dam(Sokcho, Gangwon Province)



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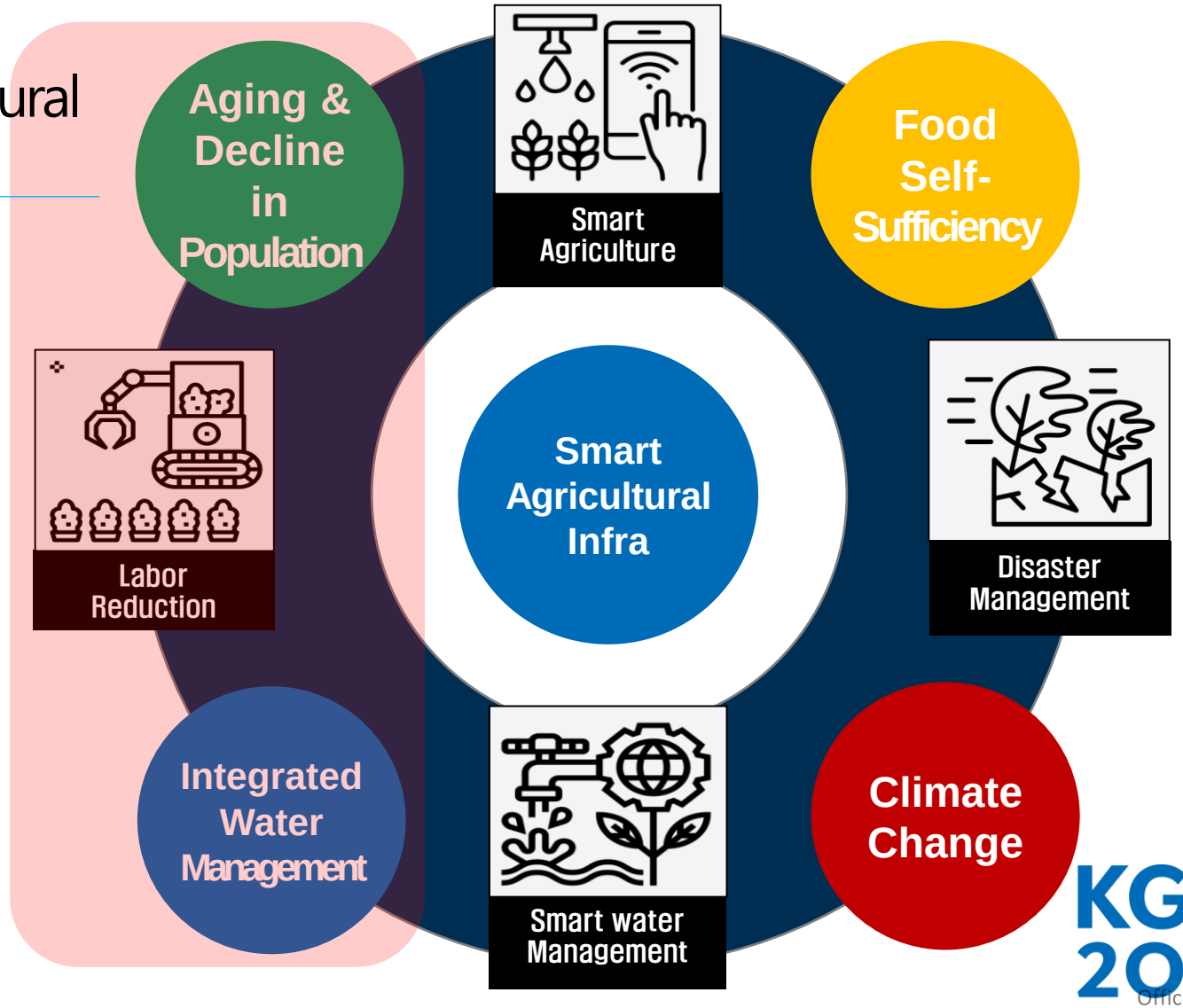
Ⅲ. Labor Reduction

Vision Smart water management for preparing for declining agricultural population and aging society

Labor Reduction

	As - Is	To - Be
Water Control	Manpower	Remote Control
Channel Type	Open Channel	Pipe Channel
Water Supply	Continuous Irrigation	Intermittent Irrigation



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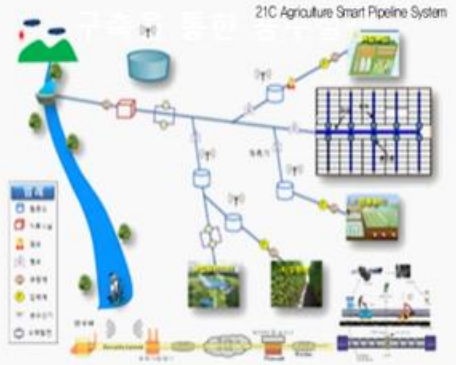
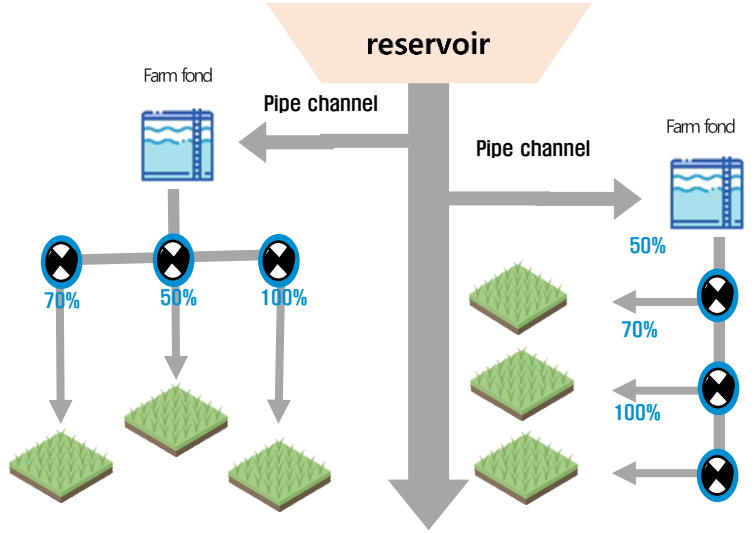
Ⅲ. Labor Reduction

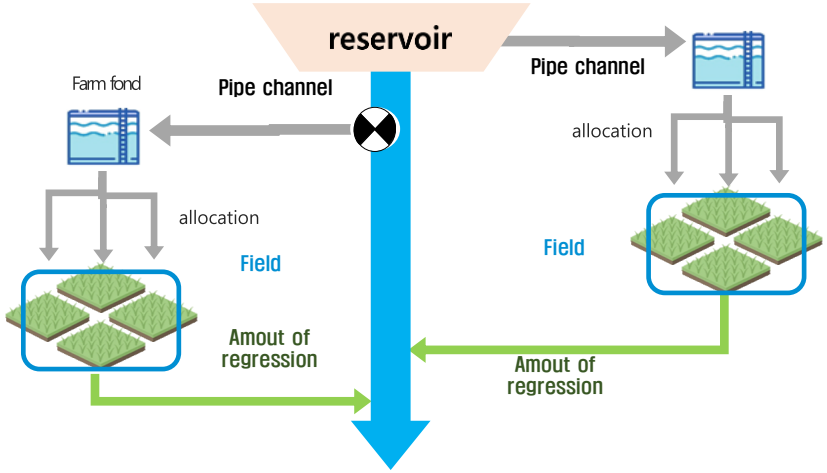
Smart Water Monitoring & Distribution system

Big Dataization	Digitize Waterway Diagram	Decision-making System
Automatic Instrumention Management	Digitalization of Waterway Diagram	Support Decision-making in case of Drought



Smart water supply system by utilizing ICT technology





Rational utilization · distribution of water resources and establishment of a water circulation system

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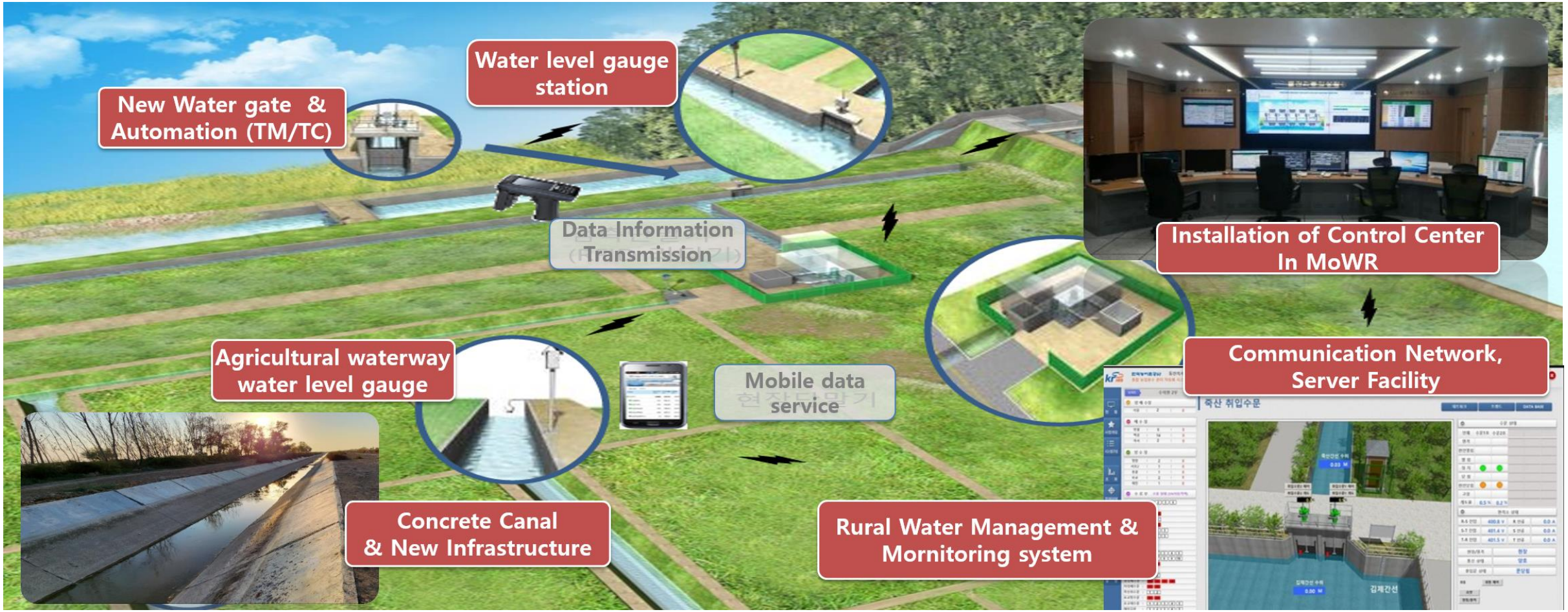
Ⅲ. Labor Reduction



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Ⅲ. Labor Reduction

Eco-friendly weed control

Temporary weed control through mowing

Constant weed control through sod culture

Low Cost
Semi-permanent weed control and labor saving

Safety
Prevention of safety accidents at agricultural infrastructure

Eco-friendly weed control

Tour, Education
Clean rural space and eco-friend educational facility

Environment
Bee ecosystem and environmental pollution reduce

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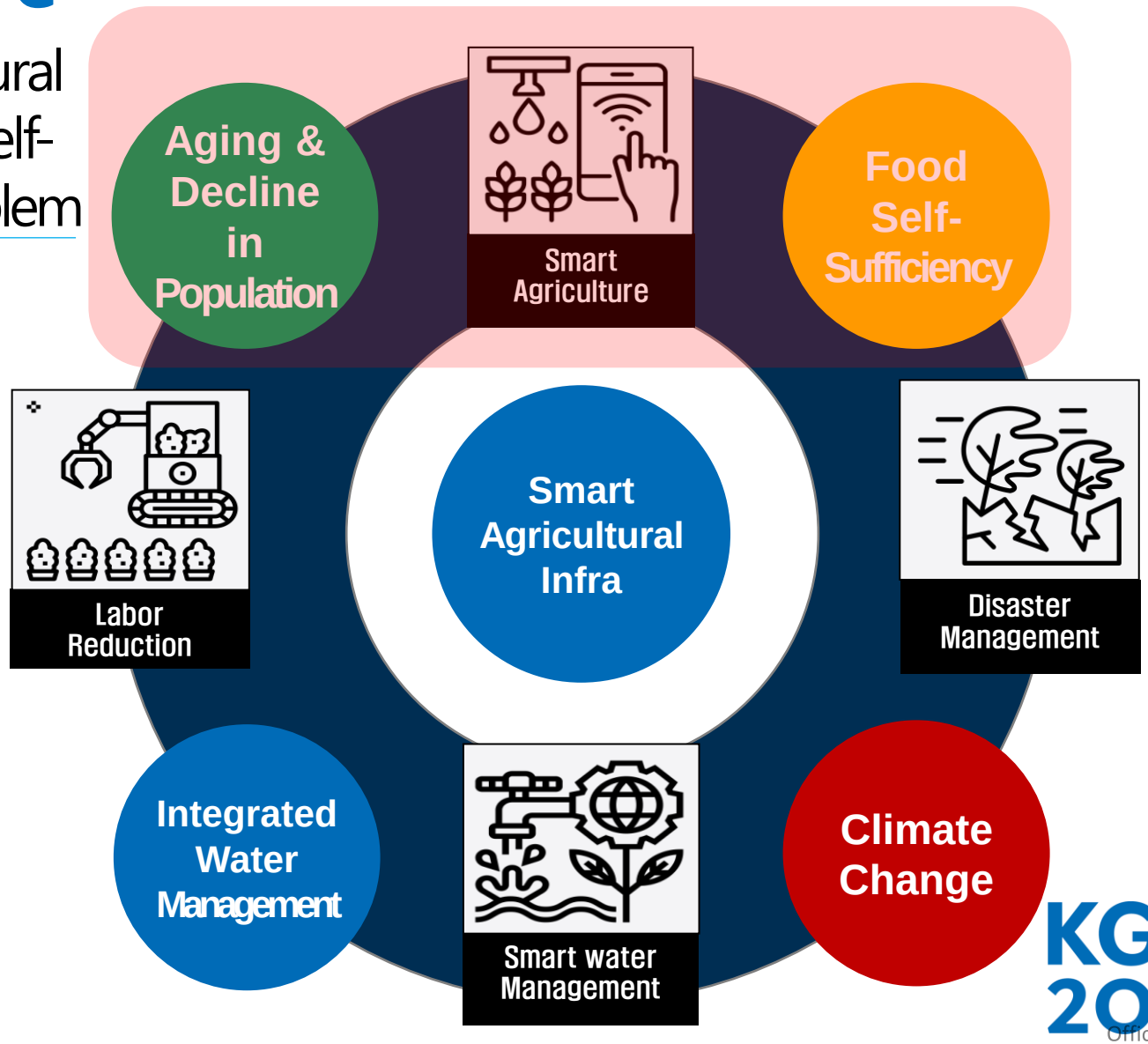
IV. Smart Agriculture

Vision Establishment of Smart agricultural infrastructure to address food self-sufficient rate & population problem

Smart Agriculture

	As - Is	To - Be
Target	Facility farming	Open field farming
Type	Manpower	ICT, IoT, Drone
Water Supply	Open Channel	Open + Pipe Channel



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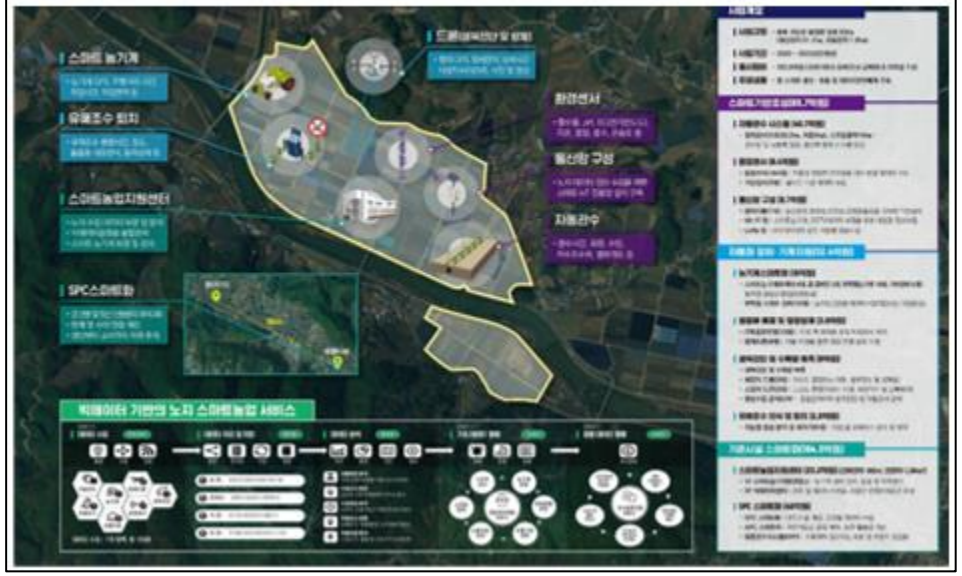
IV. Smart Agriculture

Data-Driven Smart Agriculture(Goesan)

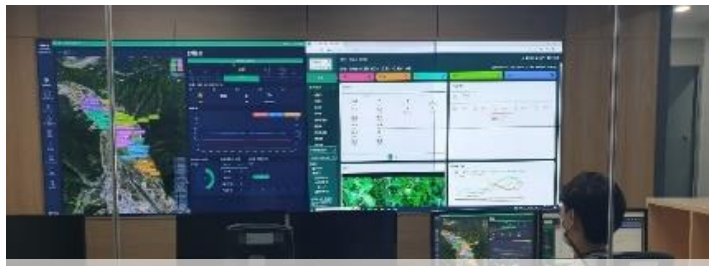


Crop growth diagnostic equipment

Unmanned past control device

Standard Model of Future Orchard(Andong)

Past control drone



Integrated platform control

The case of smart agriculture(Goesan, Chungbuk and Andong, Gyongbuk)

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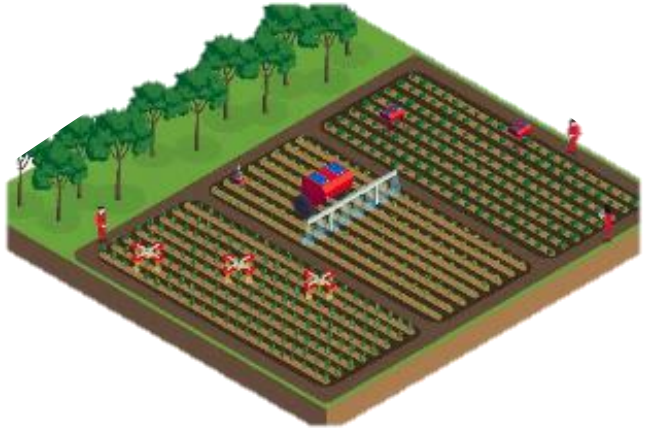
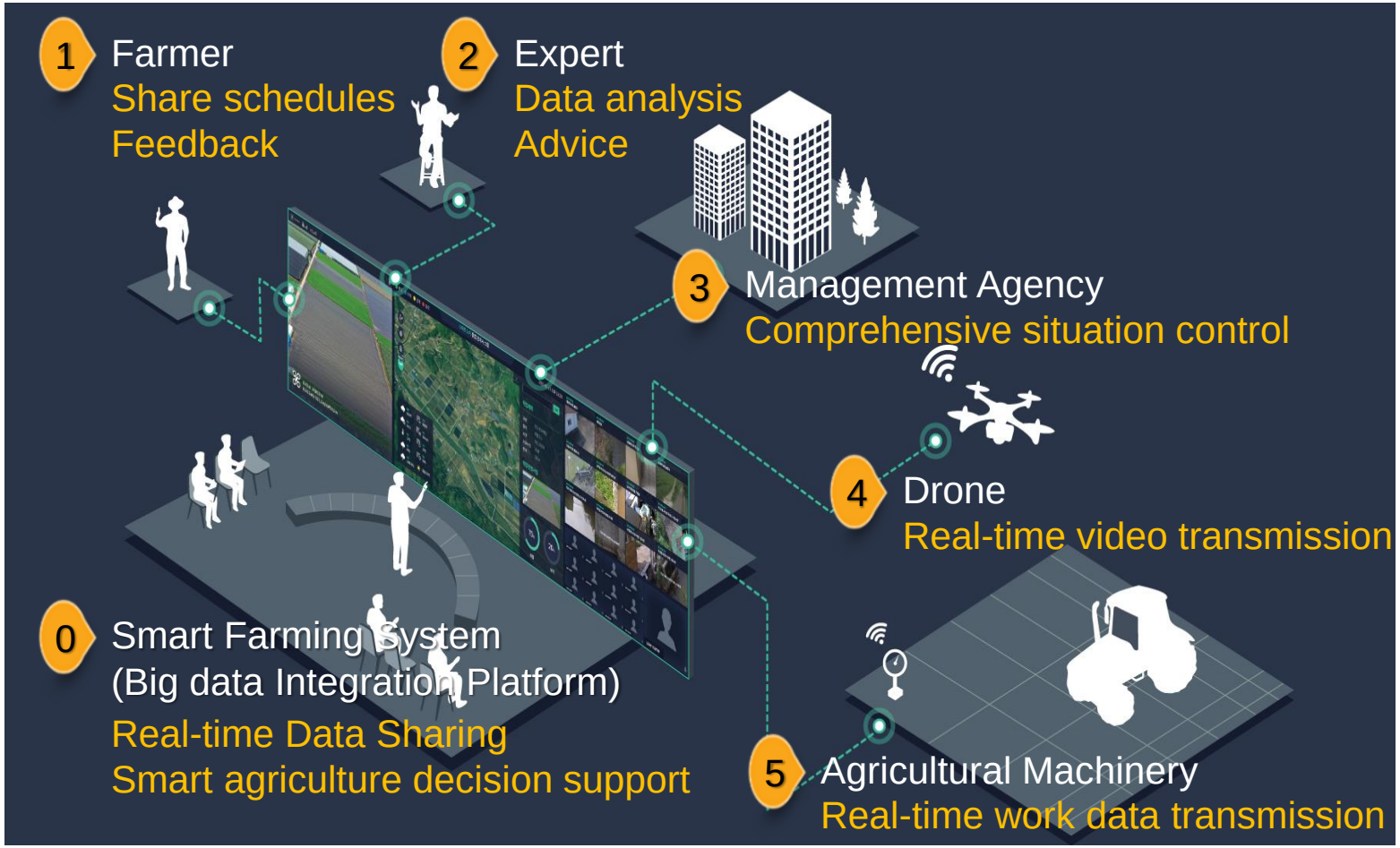
IV. Smart Agriculture

Smart Farming System



Smart farm development

Autonomous farming equipment (John Deere)



Futuristic unmanned agricultural platform

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IV. Smart Agriculture

Renewable Energy

Main Project Types

태양광
Solar Power

"Convert sunlight into electricity
· Floating solar on reservoir surface
· Canal-type solar using irrigation channels
· Ground-mounted solar on idle land

소수력
Small Hydropower

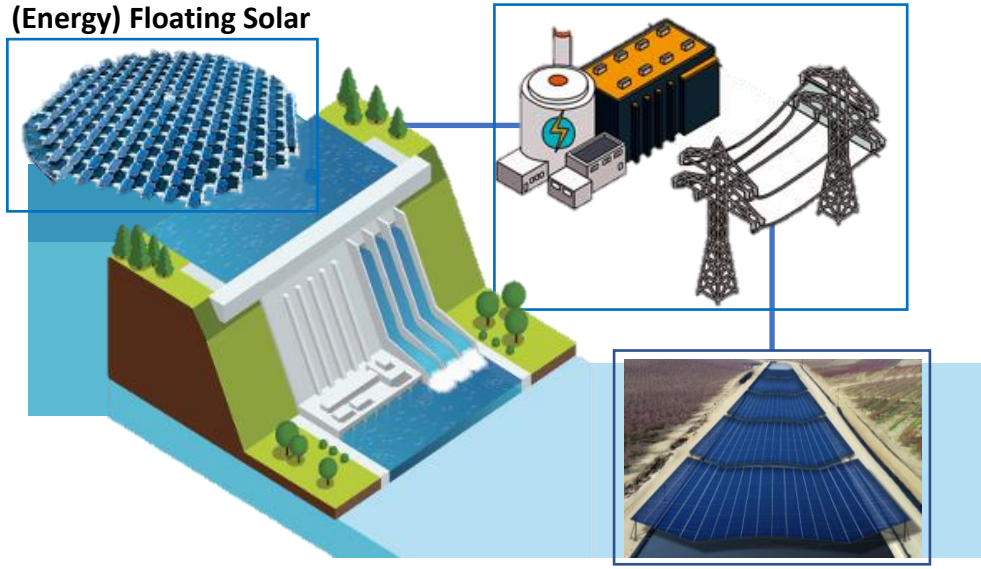
"Hydropower using water drop(head)
· Small hydropower using reservoir discharge
· Micro-hydro using irrigation canals

풍력
Wind power

"Converts wind to electricity
· Wind power using idle coastal land (high wind zones)

(Energy) Floating Solar

(Energy) Small Hydropower



(Energy) Canal Top Solar Power

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IV. Smart Agriculture

Value Chain

“NUROA” is an eco-friendly beauty brand created by ‘Water Farm’, a venture team of KRC, using the effective ingredients of ‘Marum’, an aquatic plant that grows in agricultural reservoir and means “Beauty that benefits the world”

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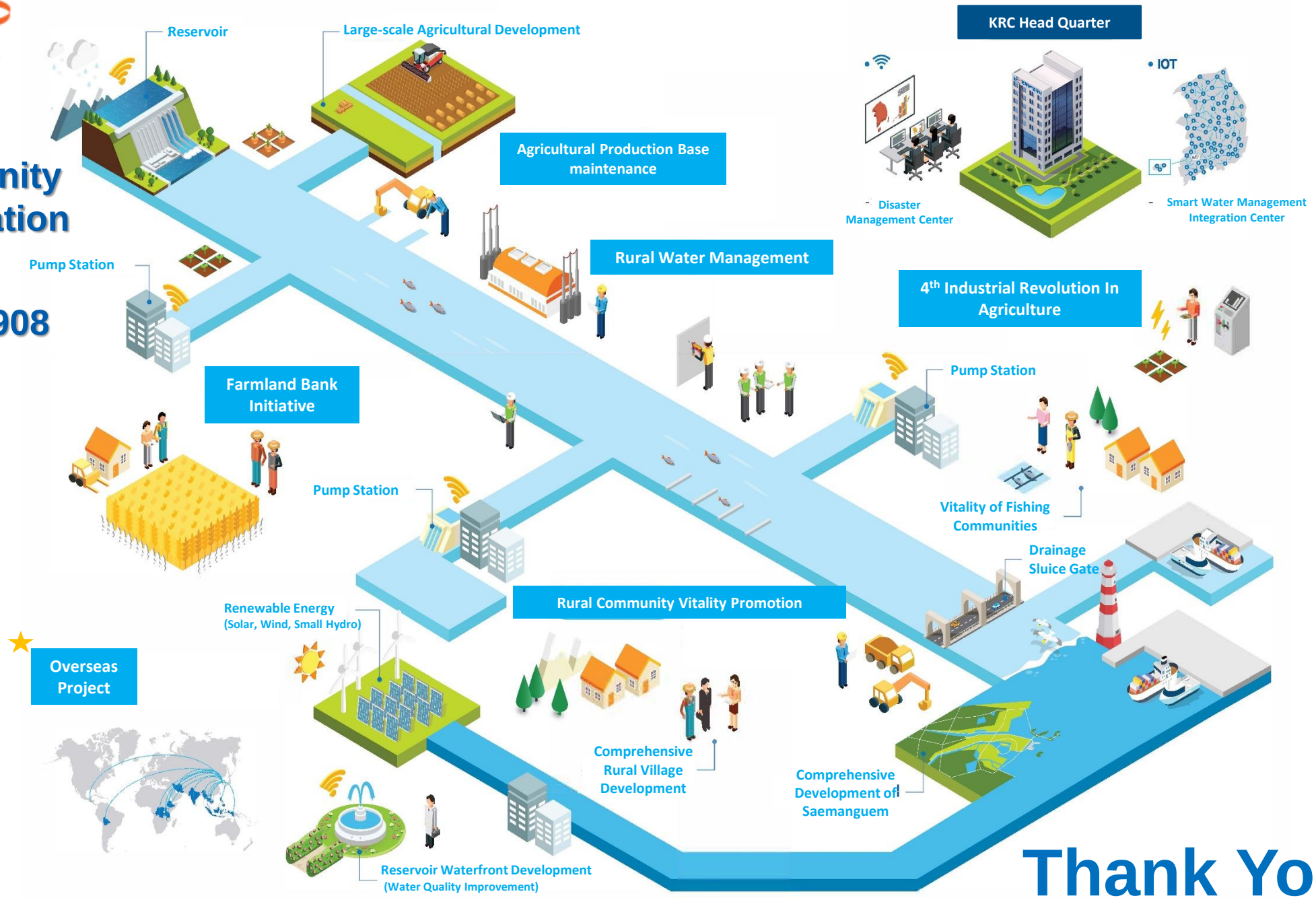
Korea Rural Community Corporation (KRC)

Since 1908



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Thank You 2025