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Leveraging Korean Experiences for Agriculture and Rural Development

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1 **Agricultural Policy
Transformation**

01 Agricultural Policy Transformation

Growth and Changes of Korean Economy

- 1970~2000 GNI increase
 - ✓ 34 times (agricultural sector) vs. 227 times (national economy)
- Share of farm population
 - ✓ 44.7% (1970) → 8.6% (2000)
- Quickness of the transformation
 - ✓ Share of ag. production 40% to 7% → 113 years (UK), 73 years (Japan), 26 years (Korea)
 - ✓ Share of ag. workers 40% to 16% → 70+ years (UK), 31 years (Japan), 14 years (Korea)



01 Agricultural Policy Transformation

Main Issues and Policies by Period

Park et al. 2016

Period	Main Issues and Policy Direction
Before Industrialization (~1960s)	<ul style="list-style-type: none">• Creation of owner farming through 'Land Reform'• Food shortage and food aid: Efforts to enhance agricultural production, land development
Industrialization period (1960s~1980s)	<ul style="list-style-type: none">• Rice self-sufficiency using price support and enhancement of agricultural productivity• Increased productivity through 'Green Revolution'• The era of commercial agriculture in horticultural sector and spread of capital-intensive farming (greenhouse)
Restructuring Policies (1990s~2000s)	<ul style="list-style-type: none">• Agricultural Structural Reform to enhance competitiveness after conclusion of the UR• Agricultural market opening through FTAs with major countries• Establishing social safety net for farm income and rural development by direct payment programs
Paradigm Shift (2000s~)	<ul style="list-style-type: none">• Policy coverage: from traditional farming to so-called 'Sixth Industry' (farming + processing + green tourism)• Policy customer: from farmer to producer, consumer, and food enterprises• Agricultural market: from domestic to new export market

01 Agricultural Policy Transformation

'Signature' Policies of Decades

1945-1950s

Farmland Reform, Food Aid

1960s

R&D Institution (Rural Development Administration),
Farmers' Organization (NACF), Food Productivity Policies

1970s

'Green Revolution', *Saemaul Undong*, Agricultural
Infrastructure Development

1980s

Rural Industrial Park, 'White Revolution'

1990s

'Multifunctionality', Direct Payment, Environment-friendly
Agriculture

2000s

FTA, Rural Village Development Projects, Smart Agriculture



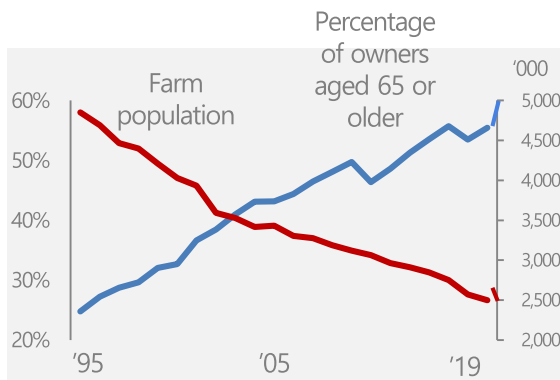
01 Agricultural Policy Transformation

Background

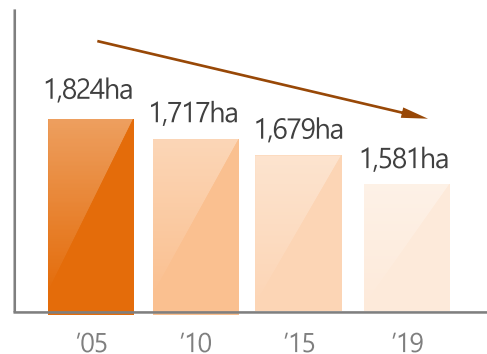
Reference: Yoo (2021)

- Issues and concerns in agriculture and rural area of Korea

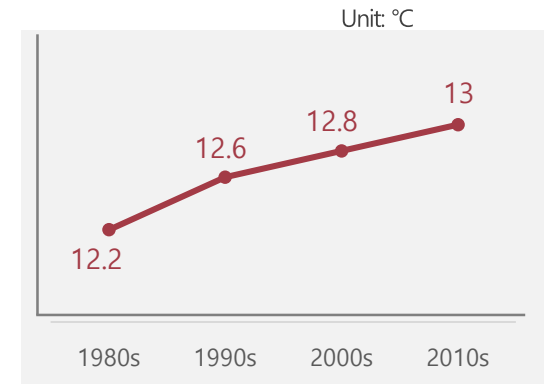
Farm population



Agricultural land



Average temperature



Aging of the farm population + **Reduction** of agricultural land + **Climate** change
→ Disadvantaged conditions for agriculture



01 Agricultural Policy Transformation

Korean Case: Key is "How to Contextualize from Lessons Learned"

- A thorough analysis of agricultural and rural development policy approaches of Korea and **how to contextualize** them for application in other countries including the Philippines can contribute to the overall development of the people.
- Successful or failed, sustained or discontinued, praised or blamed, considerate analysis will help derive **lessons to be learned** in making decisions by officials concerned in other countries.



2 Rural Development

02 Rural Development

Community Development Project in 1960s

- UN's model of rural development
- 'Community Development Agents' dispatched
- Planning for model villages

* Flag of SMU



Saemaul Undong in 1970s

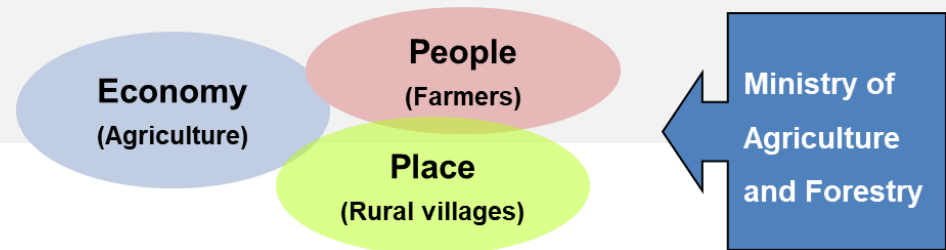
- Nationwide mobilization of resources, policies and people
- Comprehensive development of village as planning unit
- Competition and incentive, voluntary leadership
- Strong drive by authoritarian state, massive mobilization of people and resources



02 Rural Development

Comprehensive Rural Area Development Project in 1980s

- District as development unit
- From sectoral to territorial development
- Bottom-up budgeting
- Ended up as pilot program



Settlement Zone Development Projects in 1990s

- Rural township as target of development
- Hardware and social infrastructure improved substantially



02 Rural Development

Rural Development Projects Focusing on Village Development since 2000s

- Village, the development unit again : equity than efficiency
- Integrated approach with emphasis on multi-functionality
- Contest-based target village selection

- **A Case: 'Rural Agreement Program' (2019~)**

- ✓ Agreement between MAFRA and local governments for revitalizing rural life zone ('365 Life Zone') for five years
- ✓ To guarantee (i) access to basic services such as health and education with 30 minutes, (ii) access to complex services such as culture, education and medical care within 60 minutes, and (iii) an emergency response within 5 minutes



02 Rural Development

Summary of Policies

Approach	Feature	Selection of targets	Geographical unit
Community Development (1960s)	<ul style="list-style-type: none">• Participation by villagers and extension advisors	<ul style="list-style-type: none">• Pilot project	<i>Ri</i> (village)
<i>Saemaul Undong</i> (1970s)	<ul style="list-style-type: none">• Strong, nationwide mobilization• Leadership and enlightenment• Competition and incentive• Living condition improvement	<ul style="list-style-type: none">• Nationwide project	<i>Ri</i> (village)
Comprehensive Rural Area Development (1980s)	<ul style="list-style-type: none">• Integrated, territorial approach• Subsidization based on people's needs	<ul style="list-style-type: none">• Pilot project	<i>Gun</i> (district)



02 Rural Development

Summary of Policies

Approach	Feature	Selection of targets	Geographical unit
Settlement Zone Development (1990s)	<ul style="list-style-type: none"> Rural center development Hardware renovation (infrastructure, houses, etc.) 	<ul style="list-style-type: none"> Application; screening; and selection 	<i>Myeon</i> (township)
Rural village development projects (since 2000s)	<ul style="list-style-type: none"> Resource mobilization utilizing multi-functionality Village centered, contest-based approach 	<ul style="list-style-type: none"> Application; screening; and selection 	Cluster of <i>Ri</i> (villages)
Rural Center Revitalization Project (2015-) and Rural Agreement (2019-)	<ul style="list-style-type: none"> Development of rural center for public service provision through linkage between center and the rest territory Provision of adequate public services to rural centers 	<ul style="list-style-type: none"> Application; screening; and selection (agreement) Pilot project; Application 	<i>Gun</i> (district) <i>Gun</i> (district) / cluster of <i>Ri</i> (villages)



02 Rural Development

Factors Critical in Designing Rural Development Policies

Targeting: nationwide or pilot?

Nation-wide application

Support for the pilot/selected regions

All the regions to eliminate absolute poverty

Selective development to remove growth gaps among rural areas

Planning level: village or district?

Focused development of the backward villages

Connected development between the center and the hinterland

Collective activities and mobilization for common village resources

Expansion of living boundary, so township or district-level project



02 Rural Development

Factors Critical in Designing Rural Development Policies

- Securing sustainability through 'Human Capital' : leaders, local planning
- Local governance and participation

Voluntary microscopic
governance by local
residents

Technology, knowledge and
knowhow to manage economic
facilities, common assets, etc.



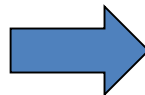
3 Agricultural Mechanization

03 Agricultural Mechanization

Rate of Mechanization

%. As of 2020. MAFRA (2021).

Paddy field works (Average)	Dry field works					
	Average	Tillage	Planting	Mulching	Pest control	Harvest
98.6	61.9	99.6	12.2	73.0	93.2	31.6



03 Agricultural Mechanization

Related Laws and Regulation

- ‘Agricultural Mechanization Promotion Act’ (1978): a basic public platform
- ‘Master Plan for Agricultural Mechanization’
 - ✓ 9th ‘Five-Year Agricultural Mechanization Plan’ (2022~2026)

Support for the Industry by the government

- Supports for domestic industry: designation and funding for domestic assemblers, control of parts and machinery importation; tax incentives
 - Domestic production completed for most machinery in 1990s
- Supports for export since mid-2010s
 - * Exported 1.47 billion USD (2021)
 - ✓ R&D for high-tech machinery production
 - ✓ Fairs, market information, loans for production, etc.

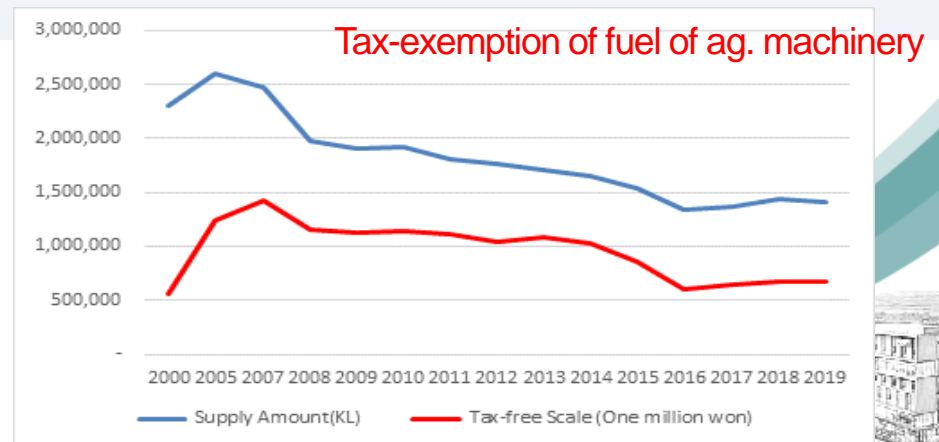
03 Agricultural Mechanization

Supply led by the government

- Designated entities for supply (NACF and company agents only)
 - * NACF : National Agricultural Cooperative Federation
- State's control of market prices of machinery (with 3~7% sales margin) (~ 1988)

Support for Purchase

- Fund sources : public special accounts, funds, loans, and NACF deposits (interest rates lower than market rates) until 1990s → currently, NACF only
- Tax-exempt fuel for machinery



03 Agricultural Mechanization

Efficient utilization of machinery: organizing farmers and rental

- Ag. Mechanization Demonstration Complex (1977~81)
 - ✓ Local gov't built complex (300ha); RDA trained farmers; local cooperatives managed; mainly for paddy production
 - * RDA: Rural Development Administration
- Mechanized Farming Corps (1981~1994)
 - ✓ 44,960 Corps formed, 37% government subsidy in total for 14 years



03 Agricultural Mechanization

- Agricultural Machinery Rental Business (2004~)
 - ✓ Managed by Agricultural Technology Centers of local governments
 - * 427 Rental Offices at 147 local governments, 84 thousand machines managed by 1,834 experts (2021)
 - ✓ 50% subsidy by central government



03 Agricultural Mechanization

9th Five Year Agricultural Mechanization Plan (2022~2026)

Vision

Smart Agriculture Mechanization for Sustainable Agricultural Production

Objectives

- Increase of dry field mechanization
- 4th stage automatic driving, electric/hydrogen fueled machinery
- Introduction of report system and accident prevention
- Human resource development and export promotion

Activities

Dry field mechanization	Extension of success cases; Concerted supports for sowing, planting and harvesting; Standardization for mechanization
Utilization of machinery	More rental offices and replacement of old machines; Aids for the disadvantaged; Computerized managing system
R&D	Development of robotic automatic driving; Low carbon electric/hydrogen fueled machinery; Test criteria for smart agricultural machinery
Institution & safety	Report system for manufacturers and importers; User protection through exchange/refund; accident prevention
Human resource, export	Expertise in ICT/IoT/AI; Maintenance & repair capacity enhancement; Untact consulting for export and supports for obtaining overseas permissions



03 Agricultural Mechanization

Implications

- State-led mechanization
 - ✓ Act and Plan (1978) for long-term process
 - ✓ Designation of producers and price determination
- Substantial role played by NACF
 - ✓ Rental, fund, grouping of farmers
- Joint use of machinery
 - ✓ Saving 520,000 KRW (\cong 366 USD) per hectare* * MAFRA (2021)
 - ✓ Joint usage by farming groups → rental



03 Agricultural Mechanization

Implications

- Preparation of legal and institutional platforms, including comprehensive plans or roadmaps: R&D, human resources, production
- Expansion from small-sized and low-end to large and high
- Development of machinery suitable for agricultural practices
- To seek ways to reduce cost of use
 - ✓ Rental or joint use utilizing farmers' groups

Farm
machine
banks

Farm
mechanization
centers

Pilot
complexes

Farm
groups

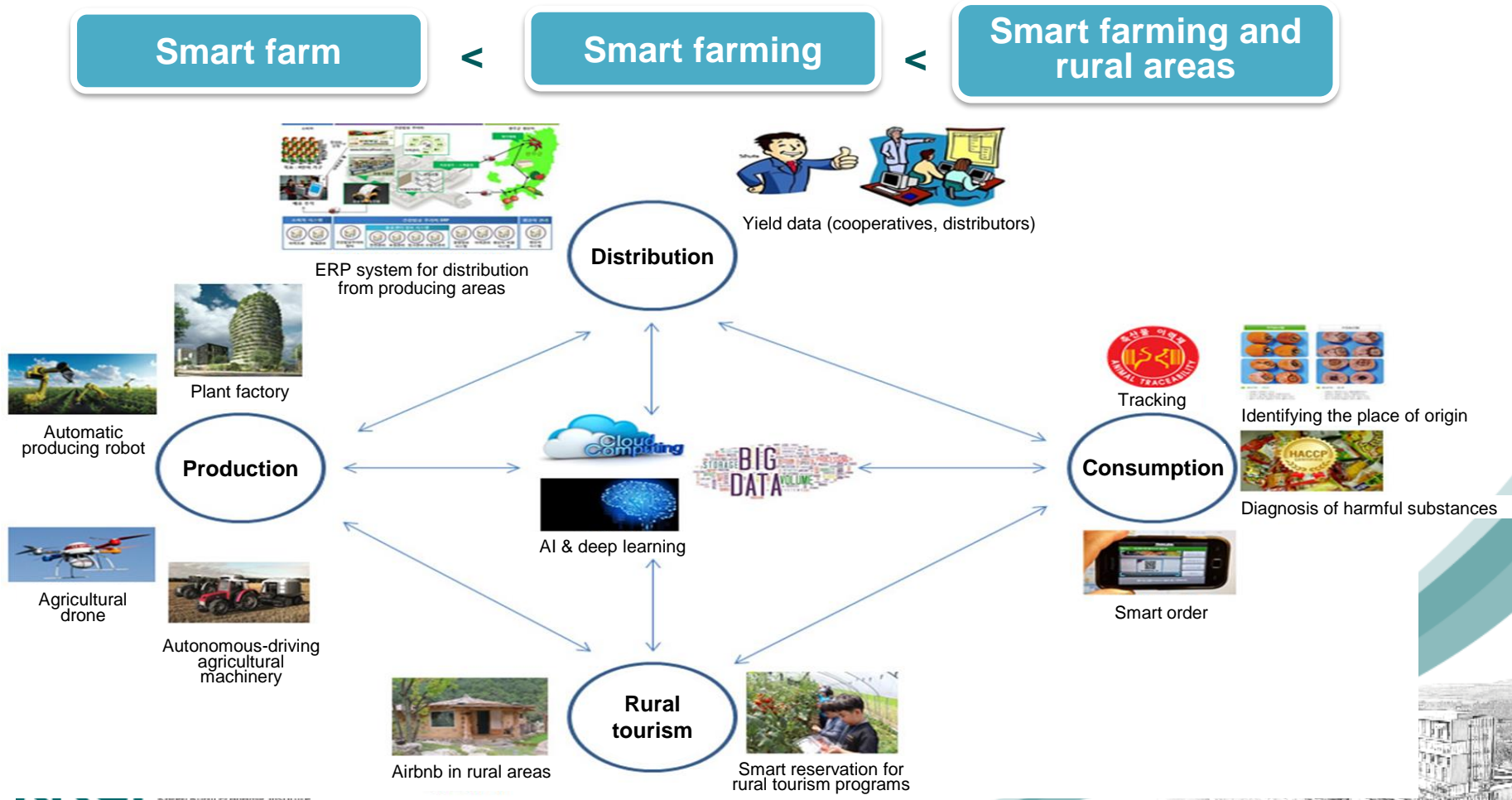


4 Smart Agriculture

04 Smart Agriculture

Smart Farming/Agriculture

Reference: Kim Y. (2021)



04 Smart Agriculture

Current status of Smart Farms in Korea

- Smart Farms ‘boom’ since mid-2010s
- Still early stage in terms of its dissemination
 - ✓ 7.7% of the total horticulture area (2019)
 - ✓ 4.5% of the total livestock farms (2019)



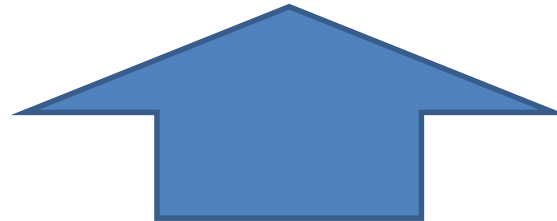
		2014	2015	2016	2017	2018	2019
Horticulture (ha)	Facility crop cultivation area	50,210	66,919	67,407	67,532	69,567	70,187
	Smart farm area	405	769	1,912	4,010	4,900	5,383
Livestock (farm)	Total livestock farms	57,885	53,301	53,462	54,876	52,870	53,098
	Smart livestock farms	23	181	430	801	1,425	2,390



04 Smart Agriculture

Key policies of Smart Farms of Korea

- ① 'Smart Farm Expansion Plan' (2018)
- ② 'Agricultural Innovation through Smart Agriculture' (2022)
- ③ 'Act on Promotion and Support of Smart Agriculture' (2022)



Current level of smart agriculture technology of Korea:
70% of EU -- 4 years' technology gap

(KISTEP 2020; recited from MAFRA 2022)



04 Smart Agriculture

'Smart Farm Expansion Plan' (2018)

1

Support for young farmer business establishment and farms

- ❖ Operate youth business incubation centers
- ❖ Support farms, including providing a lease-type smart farm
- ❖ Provide support for basic facilities and service models

2

Build a smart agriculture infrastructure

- ❖ Increase smart farm R&D investments
- ❖ Build a data foundation (standardization, platform, etc.)
- ❖ Support the commercialization of smart farm equipment (technology demonstration, export)

3

Develop leading models of smart agriculture

- ❖ (Greenhouse) Establish a smart farm innovation valley
- ❖ (Open field) Establish a model complex of open field smart farms
- ❖ (Livestock) Establish a model complex of smart livestock ICT

4

Implementation system

- ❖ Move forward with the enactment of the Act on Fostering and Supporting Smart Agriculture



04 Smart Agriculture

'Smart Farm Expansion Plan' (2018)

- Young Farmer Business Incubation
 - ✓ 'Incubation Centers' for special trainings for future business starters
- Supports for Smart Farm Farmers
 - ✓ Lease of farmlands
 - ✓ Financial supports (credit guarantee, venture fund)
- Provision of equipment and services
 - ✓ Lease of ICT equipment (measuring sensors, etc.)
 - ✓ Real-time consulting



04 Smart Agriculture

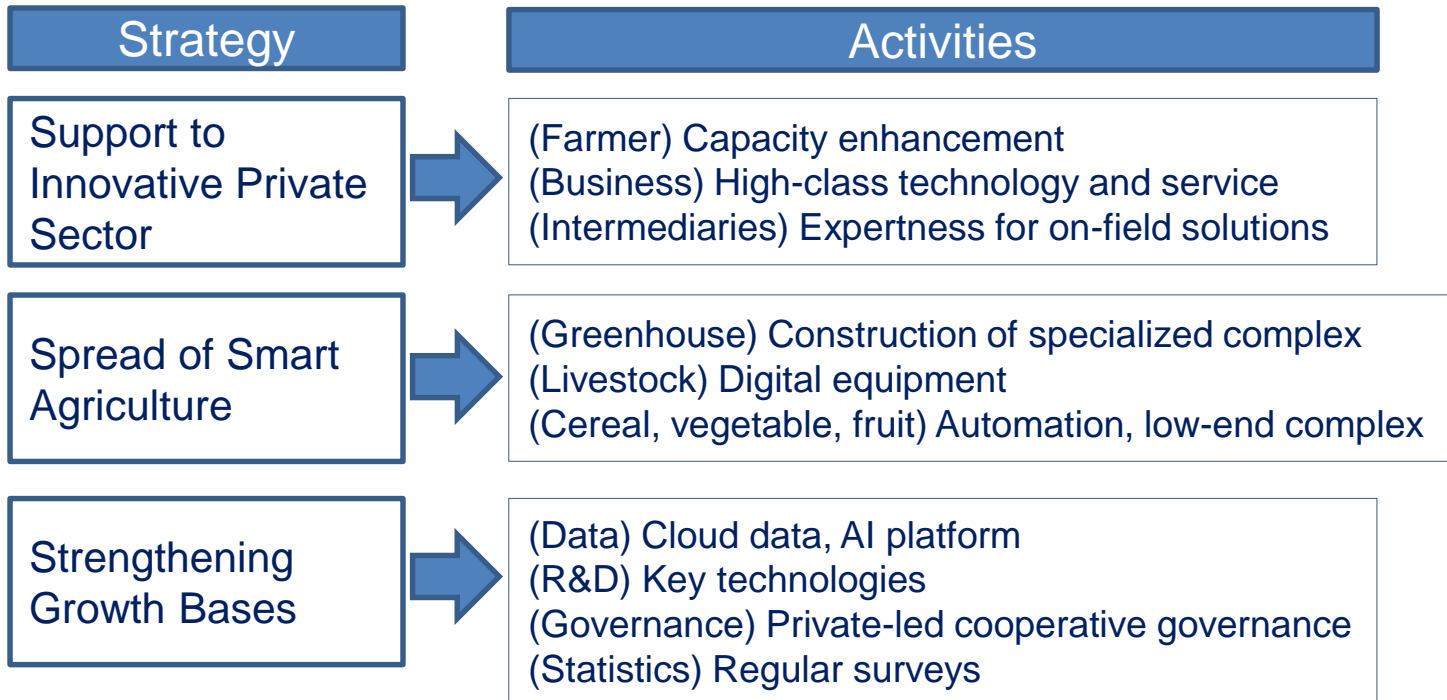
‘Smart Farm Expansion Plan’ (2018)

- Infrastructure
 - ✓ Establishment of data standard
 - ✓ Smart farm test bed
- Differentiated Models by Farm Types
 - ✓ Open Field Smart Farm
 - ✓ Cutting-Edge Agricultural Mechanization Complex
 - ✓ Smart Livestock ICT Model Complex
- Export of Smart Farm
 - ✓ Demo greenhouse in Kazakhstan and Vietnam
 - ✓ ODA for int'l cooperation



04 Smart Agriculture

'Agricultural Innovation through Smart Agriculture' (2022)



04 Smart Agriculture

‘Agricultural Innovation through Smart Agriculture’ (2022)

- Key targets
 - ✓ Agricultural production using smart agriculture: 30% by 2027
 - ✓ Unicorn companies* to emerge: 5 by 2027
 - * Newly risen company with sales more than 1 billion USD
 - ✓ Capacity building for key actors: 1,500 farmers yearly
 - ✓ Outdoor Smart Agriculture Demo Complex: 5 places by 2025
 - ✓ 8 key technologies* for domestic production and commercialization by 2027
 - * AI forecasting, AI greenhouse control, greenhouse robot, IoT for livestock, AI livestock shed control, VRT, humanless driving, outdoor harvest robot
 - ✓ Short-term lease of smart farm for young farmers: 15 farms by 2027



04 Smart Agriculture

‘Agricultural Innovation through Smart Agriculture’ (2022)

- Smart Agriculture Promotion Zones
 - ✓ Equipment supports, consulting, deregulation
- Out-of-dated livestock houses move to Smart Livestock Complexes
- ODA for smart farm export
 - ✓ From greenhouse to livestock farms



04 Smart Agriculture

First Enactment to Support Smart Agriculture

'Act on Promotion and Support of Smart Agriculture'
passed Cabinet Council (November 2022); to be
submitted to the National Assembly

- Basic development plan every 5 years and yearly plan
- Regular survey of business trends
- Human resource training institutes and 'Smart Agriculture Manager' license
- Standardization and R&D
- 'Smart Agriculture Data Platform' for private sector
- 'Smart Agriculture Support Strongpoint' and 'Smart Agriculture Support Zone' with economic incentives, etc.



04 Smart Agriculture

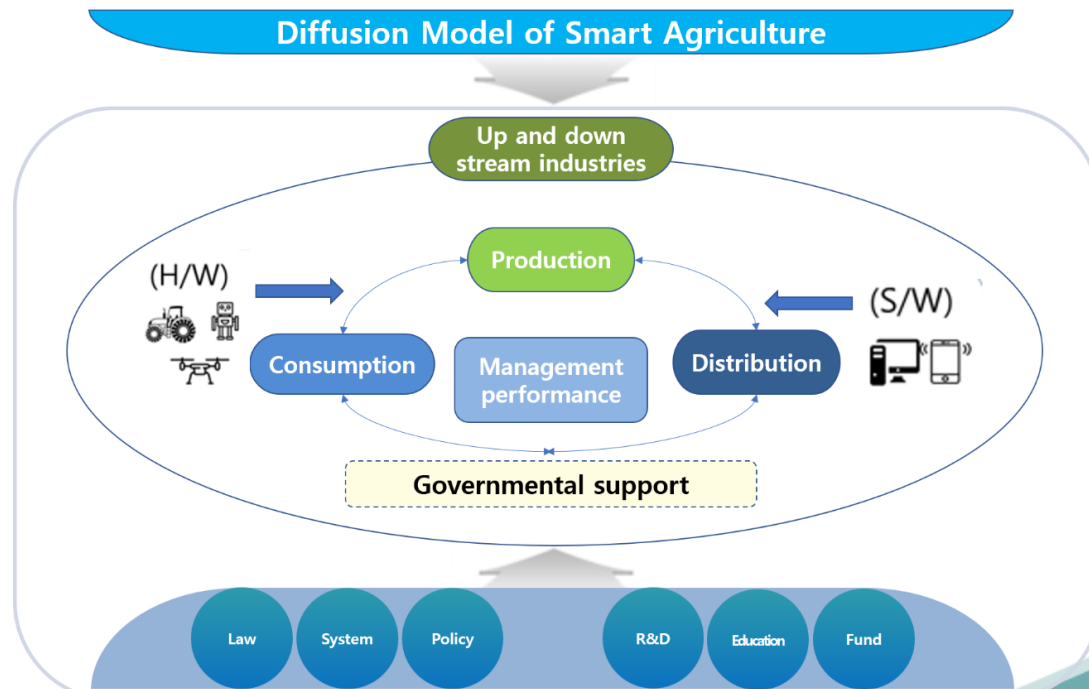
'Smart Farm Innovation Valleys'



04 Smart Agriculture

Implications for developing countries

- ICT-based, digitalized, smart agriculture can
 - ✓ Apply to whole agricultural value chain (from production to consumption)
 - ✓ Link with up and down stream industries



04 Smart Agriculture

Implications for developing countries

- Conditions: Affordability and Sustainability
 - ✓ High cost of facilities, IT infrastructure, and energy
 - ✓ Technologies and skills for operation and maintenance required
 - ✓ Marketability of products (product competitiveness, target consumer groups. . .)



04 Smart Agriculture

Implications for developing countries

- Institutional supports
 - ✓ Formation of demo smart farm complex: Public supports for physical infrastructure (electricity, transportation. . .) and financial incentives
 - ✓ Establishment of Data Bases (information about production, distribution, marketing, etc.)
 - ✓ Related institutional bases: laws, regulations, programs, organizations, human resources. . .



Thank you

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