

# Better Life in Rural Area Smart Village

2018.5.31.

Suk Kyoung KIM

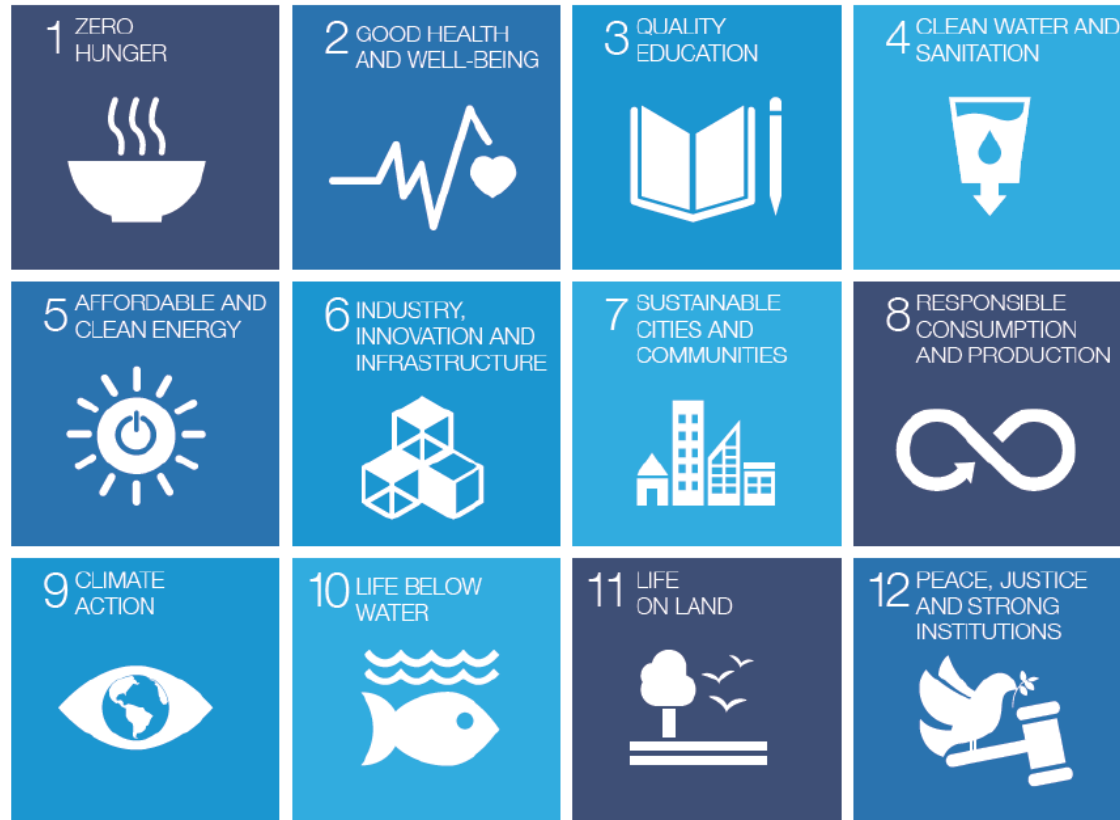
KAIST

# Contents

---

1. Introduction
2. Cases
3. Definition
4. Concept
5. Strategies
6. Types

# The 12 UN Sustainable Digital Solution



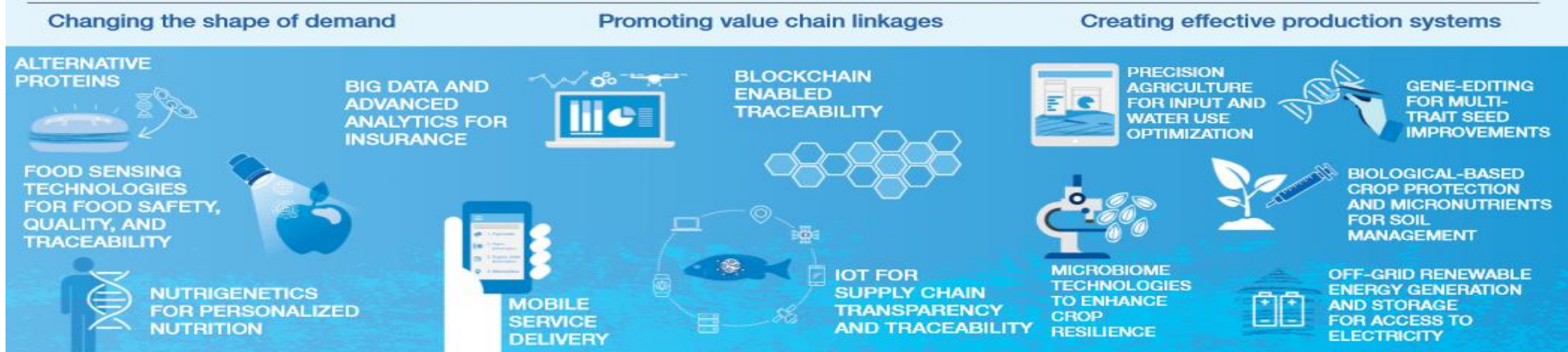
ource: World Economic Forum/Accenture analysis

# Technology Innovations for Transforming Food Systems

Figure 3: Combinations of 4IR technologies can enable innovation to solve challenges faced in food systems

Digital building blocks	Advances in science	Reforming the physical
 New computing technologies	 Next-generation biotechnologies and genomics	 Autonomous and near-autonomous vehicles
 Big data and advanced analytics	 Energy creation, capture, storage and transmission	 Advanced, smart robotics
 The Internet of Things (IoT)		 Additive manufacturing and multidimensional printing
 Artificial intelligence and machine learning		 Advanced materials and nanotechnologies
 Blockchain		
 Virtual reality and augmented reality		

Figure 4: Combinations of 4IR technologies can enable innovation to solve challenges faced in food systems



# A Vision: The Transformation of Food System



**Inclusive** – Smallholder farmers, including women and young people, are fully integrated into food systems with access to financing, insurance, transport, education, mechanization leasing and storage. Businesses, governments, international organizations and other food systems stakeholders effectively provide farmers with the infrastructure, policies, regulations and services they need to thrive.



**Efficient** – Food is produced in the right variety and in the required amounts to nutritiously feed the world. Little is lost or goes to waste: any food that is not consumed is delivered to those in need, reused to create other products or recycled into other uses, such as compost. Farmers have access to inputs and information tailored to their specific agro-environmental conditions. Government policies positively influence the decision-making of all actors towards common objectives. Land and other resources are used to their full potential. Price volatility is no longer an issue.

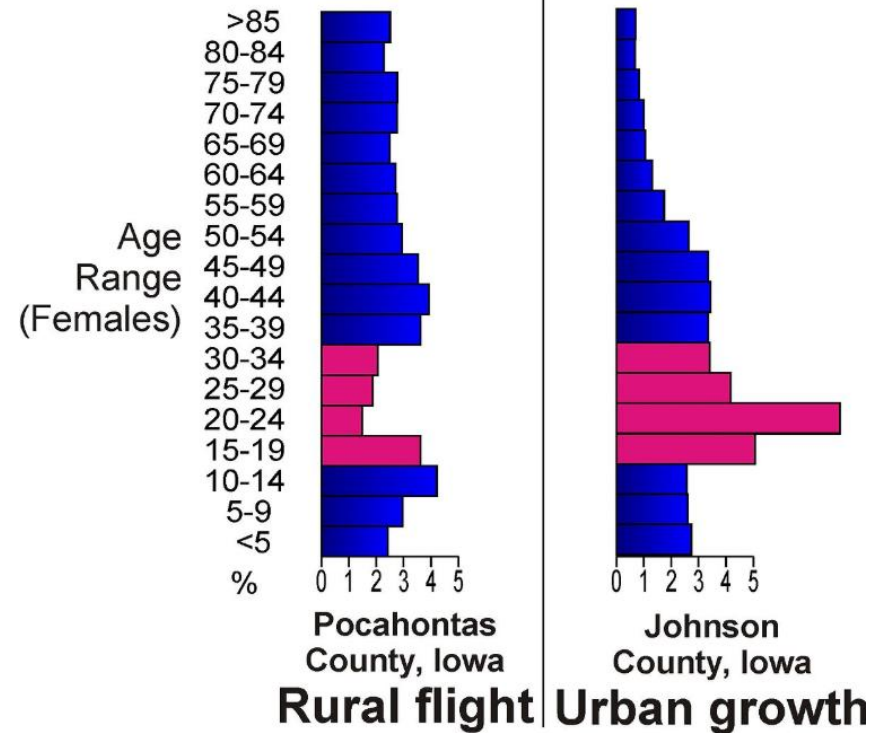
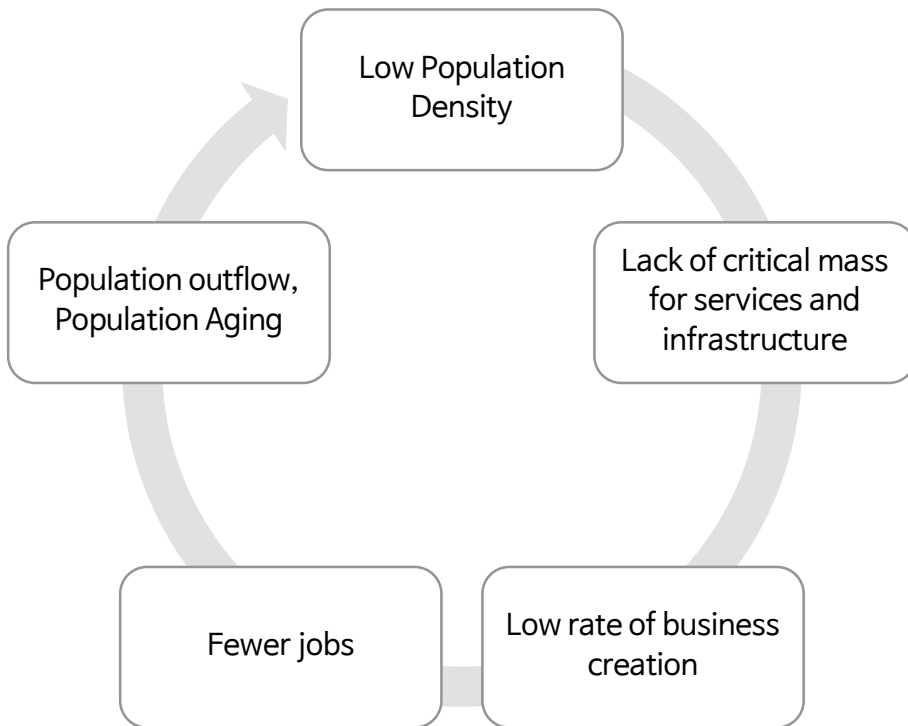


**Sustainable** – With the knowledge, desire and means to make eco-friendly decisions, consumers focus on purchasing food with the minimum environmental impact. Sustainably grown foods are universally affordable. Retailers are incentivized to stock eco-friendly foods. Companies and farmers share more information than ever about their sustainable practices, and their reputations benefit. Conscious of their land's value, farmers deploy practices that reduce environmental damage, while countries meticulously monitor their food systems environmental impact, land rights and plan for land use.



**Nutritious and healthy** – The triple burden of malnutrition – undernourishment, micronutrient deficiencies and over-nutrition – is reduced as everyone has access to nutritious food and follows a healthy diet. Enjoying better nutrition, adults are living longer, healthier lives and children are growing up to reach their full potential. Moreover, food is safe. People have better visibility of the sources and ingredients of the food they buy.

# The Loop of Declining Rural Regions



2000 U.S. Census Data

# Difference Between Rural and Urban areas

47% of world's population and 70% of the world's poor live in rural villages

	City	Village
<b>Area</b>	Urban area	Rural area
<b>Population size</b>	High Population Density	Low Population Density
<b>Development</b>	Systemically developed based on the progress of urbanization and industrialization	Randomly developed based on the area characteristic
<b>Infrastructure</b>	Well-organized	Lack of infrastructure

# Solution: Smart Village

Converged Technology



Low Population Density

Lack of critical mass for services and infrastructure

Population outflow, Population aging

Fewer jobs

Low rate of business creation



The return migration to village

Economies of scope

Improvement of quality of living and working condition

Job creation

Higher rate of Business creation



# Rural Development in India

India

Focusing on Installing Basic Electricity and Accessing to the Internet

## GHE-IEEE Smart Village in India



### Mori Smart Village



The village will be equipped with **fibre optic** connectivity; 1,900 households to get 15 Mbps internet link



e-commerce to be introduced for local **weavers**, help them strengthen brand image



Organic farming for **shrimp hatcheries**



**Power** supply to be reviewed and UPS provided

# Rural Development in Africa

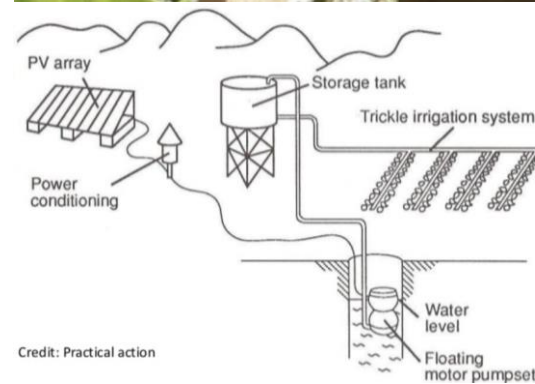
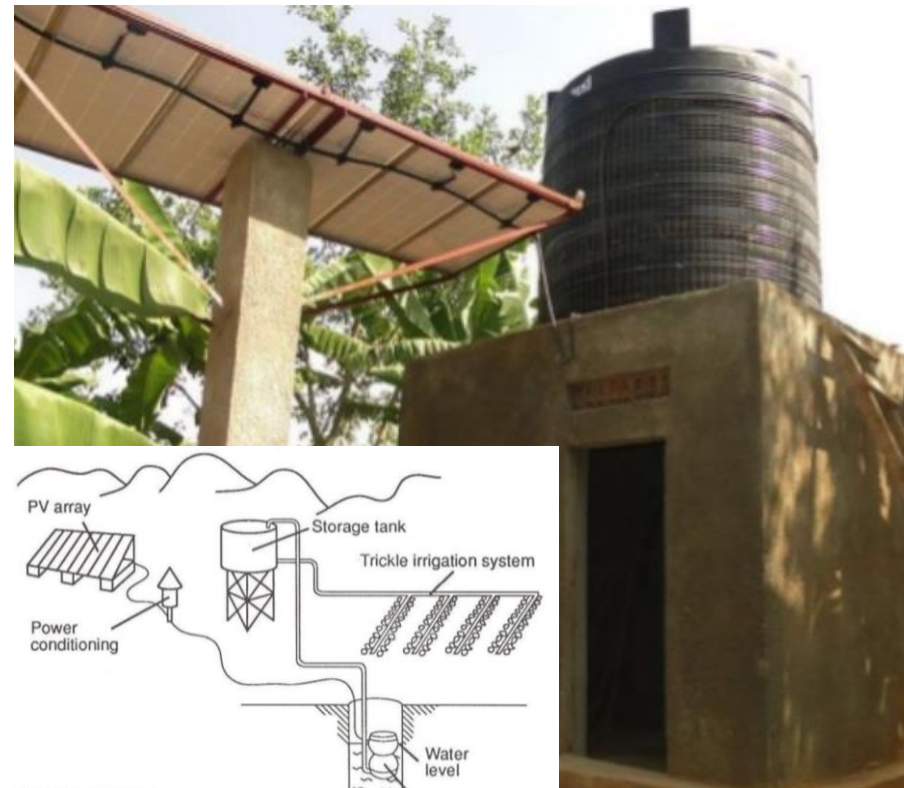
Africa

Focusing on Improving Sustainable Energy Access



Photo: IEEE Smart Village

## Solar-powered Water Pumps(Kolonyi-Innovation-Africa)



Credit: Practical action

# Rural Development in Southeast Asia

Southeast Asia

Focusing on Reducing Poverty and Food Insecurity

## CLIMATE SMART VILLAGE / FARM

### Weather smart

- Seasonal weather forecasts
- ICT based agro-advisories
- Index based insurance
- Climate analogues



### Water Smart

- Aquifer recharge
- Rainwater harvesting
- Community management of water
- Laser leveling
- On-farm water management



### Carbon smart

- Agroforestry
- Conservation tillage
- Land use systems
- Livestock management



### Nitrogen smart

- Site specific nutrient management
- Precision fertilizers
- Catch cropping / legumes



### Energy Smart

- Biofuels
- Fuel efficient engines
- Residue management
- Minimum tillage
- Solar solutions for agriculture



### Knowledge Smart

- Farmer-farmer learning
- Farmer networks on adaptation technologies
- Seed & fodder banks
- Market info
- Off-farm risk management-kitchen garden



# Rural Development in EU



Focusing on Creating Rural Value Chain



EU



Netherlands

## Sharing city (Infrastructure & Service)



## Future Village with rurality



# Rural Development in Korea

Korea

ICT Solutions for Rural Area (Smart food system → Smart Village Life)

## Information Network Village

- Smart Food System(2001-2016)



## ICT Creative Village

- Smart Village Life (ICT + Village)



# Smart Village Concept

Smart Village

Smart Working + Smart Living = Smart Village

Categories	As-Is
Value	Technology-oriented
Development Strategies	Simple Village Development/Management
Problem-solving	Extension/Infrastructure
Approaching Strategies	Uniform
Sustainability	One-off
Open	Supplier-oriented
Convergence	Single Policy/Technology



To-Be
Future value-oriented village
Future Growth-Engine village
Efficiency and Service-oriented village
Space/Technology/Subjects Customized village
A Sustainable Village Platform
Open Village to Consumers and Private Participants
Policy/Business/Technology Convergence village

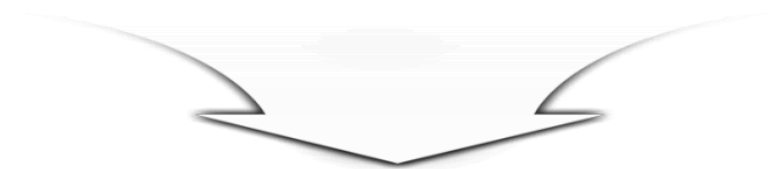
# Smart Village Definition

## Developing Countries

Improving people's access to sustainable energy for a high quality of life

## EU

Increasing people's profits by a better use of ICT and Knowledge



**A village that everyone can have a better Work-Life balance using by innovative technologies in Futuristic and Sustainable Community**

# Smart Village Concept Model

Innovative Technologies



	Smart farm	Agricultural Bio-tech	Ag-Tech Hub	Smart Factory	Smart Logistics & Distribution	Smart Tourism	Zero Energy House	Smart Grid	Smart Life ICT
<b>Smart Village Objectives</b>									
Enhancing Competitiveness of Village									
Increasing Quality of Village Life									
Sustainable Rural Community									
<b>Village Problems</b>									
Low Population Density, Aging									
Low Value Creation									
Lack of Infrastructure									



# Smart Village Strategies

Vision

South Korea: Live Well Together,  
Establishing the World's Leading Smart Village

Objectives

Creating SMART Village where everyone can have a better  
Work-Life balance using by an efficient/effective ICT  
\*Sustainable Management and Rural Settlement

Keywords

Inclusivity Sustainability Innovativeness New Industry  
Creation

Strategies

- Approaching a bottom-up strategies based on rural areas/assets advantages
- Solving local problems in rural areas and finding new industries
- Providing a comprehensive problem-solution
- Applying a suitable technological convergence for a rural environment
- Targeting for an open platform through consumers and private participants

# Smart Village Types

Types

## Smart Village Types through Village Classification

<b>Perspectives</b>	Prospective (Value creation)	<b>(2) Village Economic Development</b>	<b>(3) Future Village</b>
	Existing (Problem-solving)	<b>(1) Village Problem Solving</b>	
		Existing (Current Residents)	Prospective (Ex-urban migration)
		<b>Customers</b>	

# Smart Village Type (1)

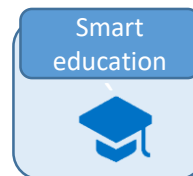
Type 1

Smart Rurban Model: Village Problem Solving



- Maximizing advantages of City and Village
- Sharing Infrastructure of Smart Cities

• Smart Village Life

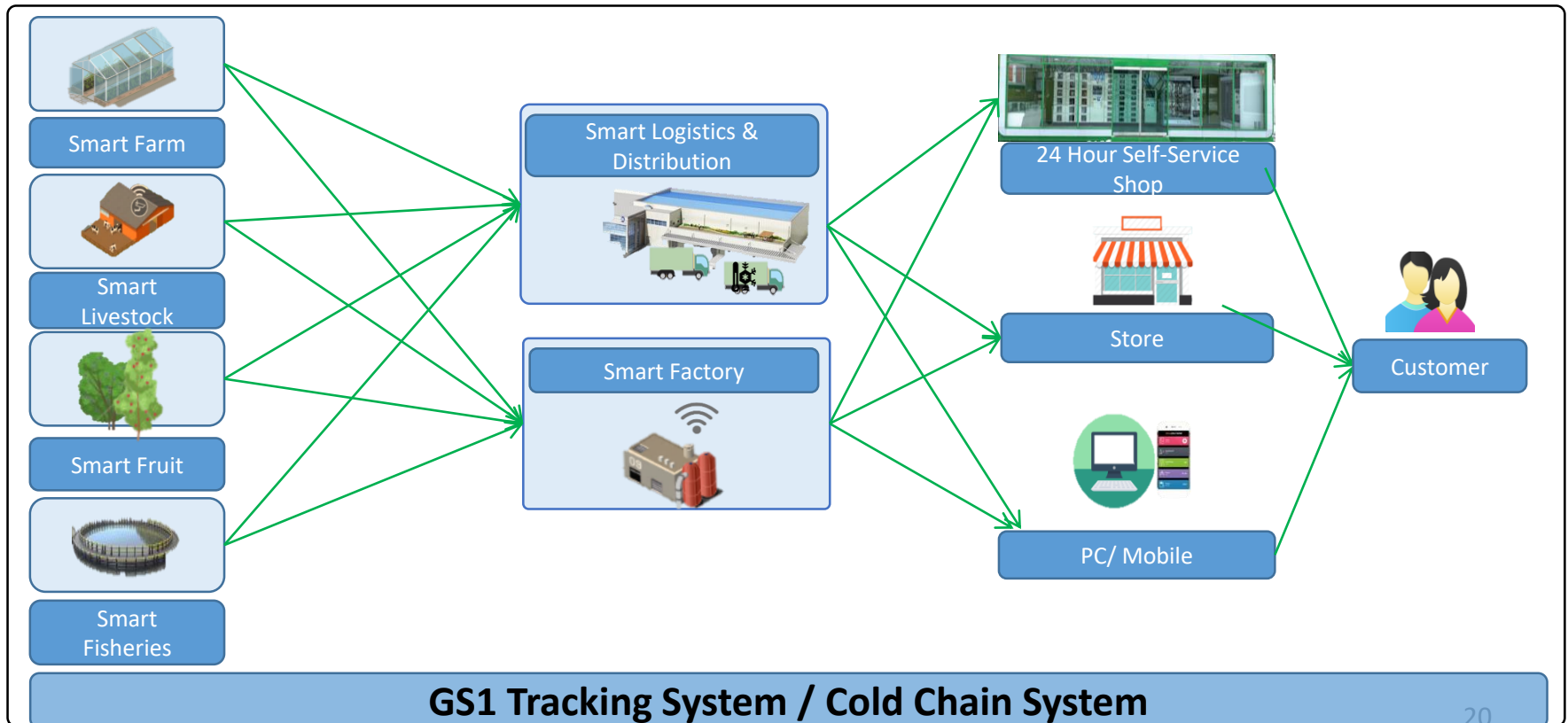


# Smart Village Type (2)

Type 2

Agro-Biz valley Model: Village Economic development

- **Smart Rural Value Chain** : **ICT solutions** are applied to the entire value chain of production, processing, and distribution to provide safe foods for consumers and to create added value for farmers.



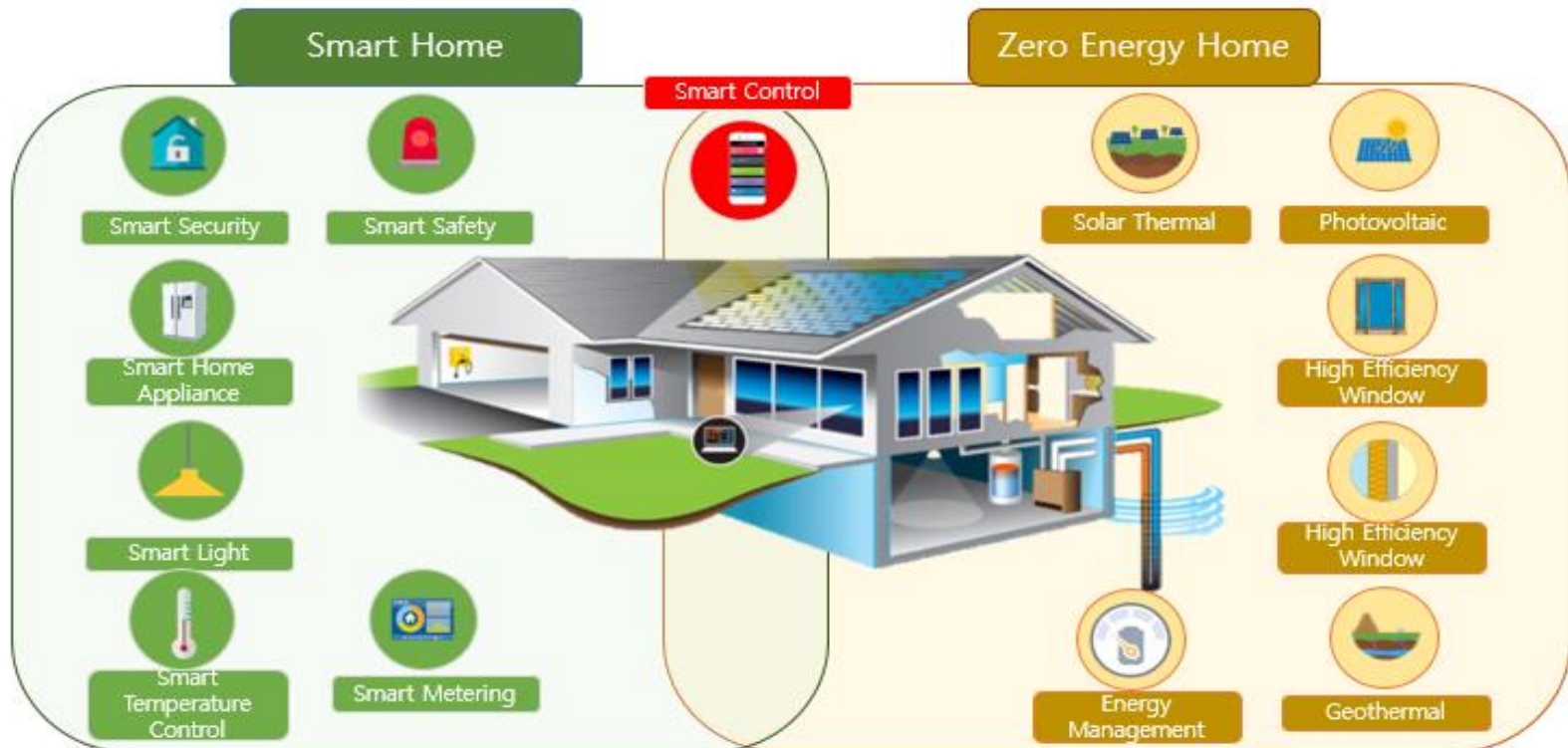
# Smart Village Type (3)

Type 3



Future Village Model: Sustainable Future Village

- **Zero Energy house:** A futuristic house that maximizes insulation performances to minimize house energy loss, and utilizes the house energy



# Thank You

---