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International Commission on Irrigation and Drainage (ICID)

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Latest Trends in the Irrigation Sector in Japan

2nd Indo Global Irrigation Summit
24-25 June 2026, New Delhi India

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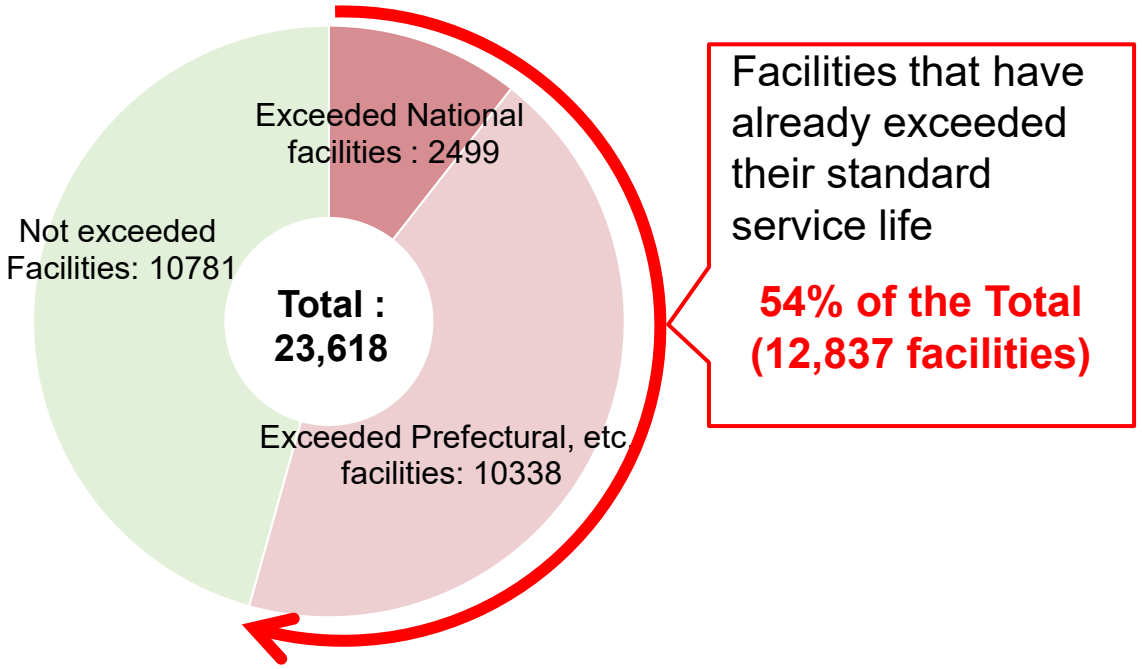
Contents

1. Background

1 - The aging of agricultural irrigation facilities

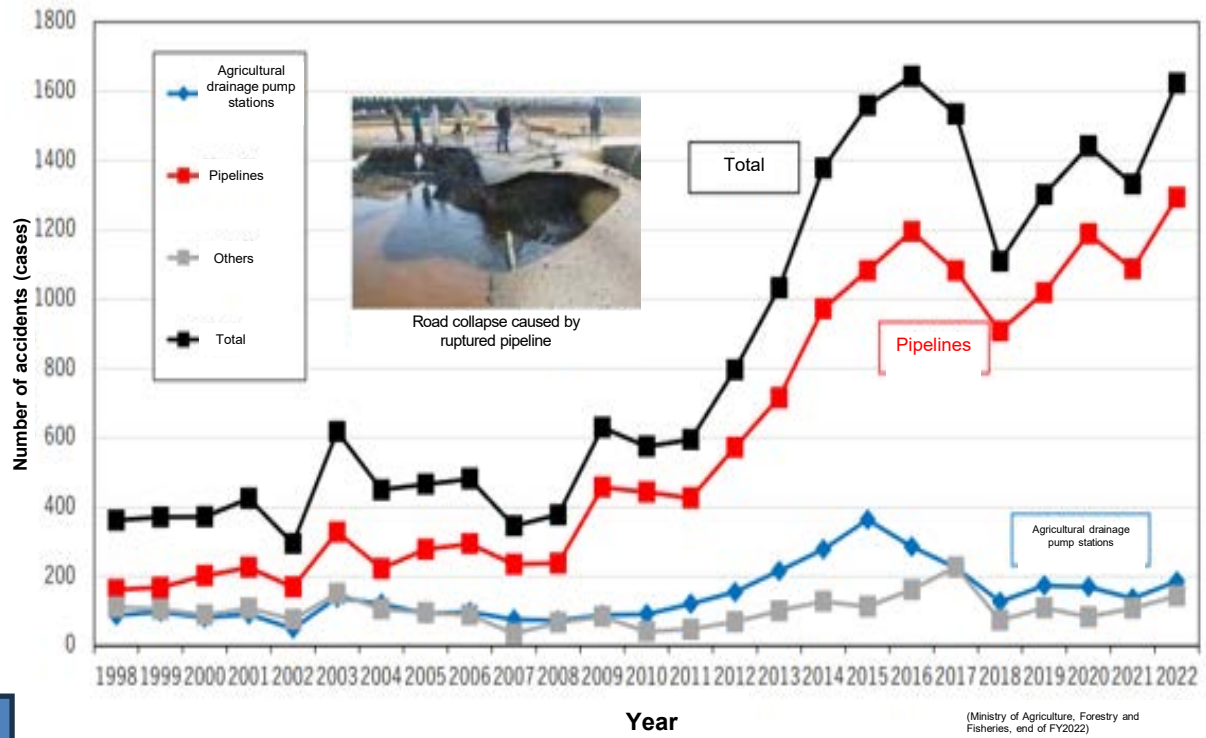
- Standard service life of core agricultural irrigation and drainage facilities



Facilities that have already exceeded their standard service life

54% of the Total (12,837 facilities)

- Sudden accidents at agricultural irrigation and drainage facilities



(Ministry of Agriculture, Forestry and Fisheries, end of FY2022)

* Agricultural drainage pump stations: Facilities located near riverbanks or levees that use pumps to discharge water from a river or waterway across the bank or levee. The general term for pumping stations and related facilities such as discharge tanks and sluice gates.

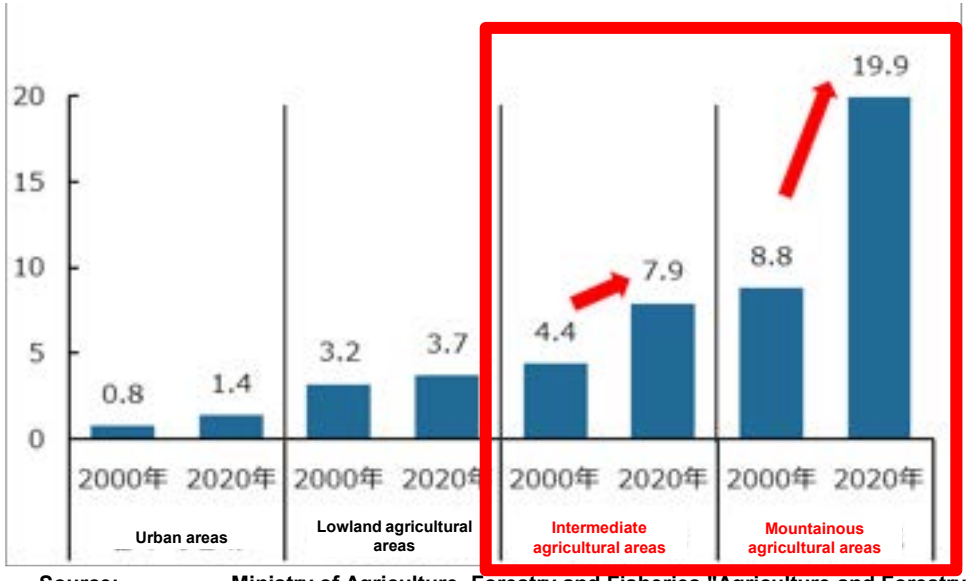
□ **Functional diagnosis, deterioration prediction, and planned repairs and updates** are becoming increasingly important.

□ **Taking preventative measures** is required, in addition to restoration in the event of an accident.

1. Background

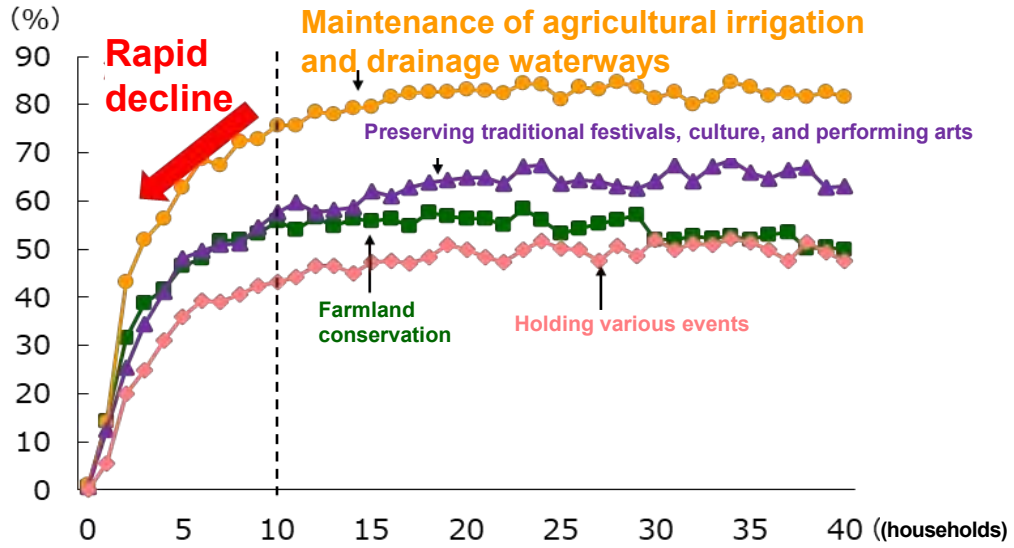
2 - Declining population in rural areas and drop in community functions

Percentage of agricultural communities with a total of nine or fewer households



Source: Ministry of Agriculture, Forestry and Fisheries "Agriculture and Forestry Census"
Note: The agricultural region classification uses the December 2017 revision.

Relationship between the implementation rate of community activities and the total number of households



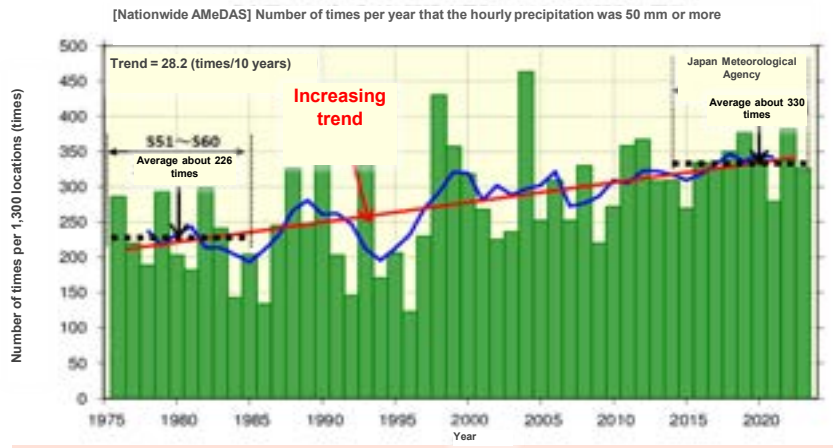
Source: "Development Process of Japanese Agriculture and Rural Structure - Comprehensive Analysis of the 2015 Agriculture and Forestry Census" by the Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries (December 2018)

- Under **the traditional division of roles**, **management and maintenance of** agricultural irrigation facilities **can be challenging and inefficient in some areas**.
- Considering the future decline in the number of people involved in agriculture, there is a risk **that management works will pose a burden on farming operations**.

1. Background

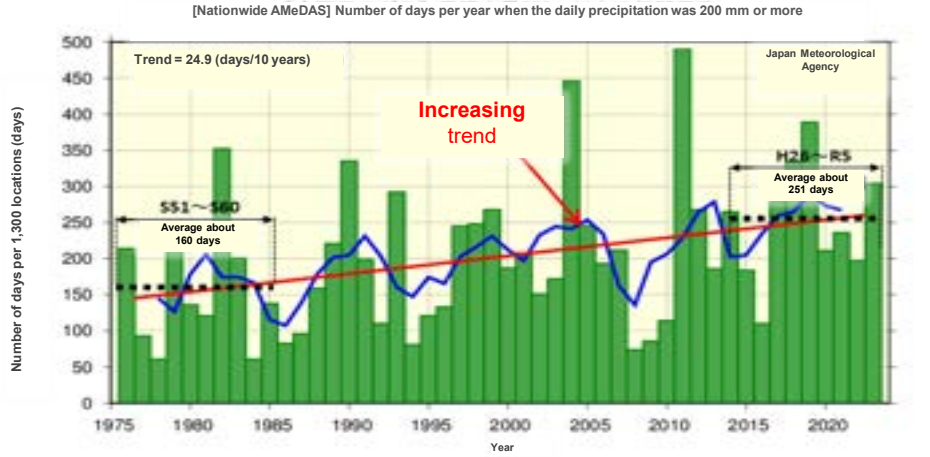
3 - Increased disaster risk due to climate change

○ **Number of times when the hourly precipitation measured by AMEDAS was 50 mm or more**



- The annual number of times of precipitation exceeding 50 mm per hour nationwide is increasing.

○ **Number of days per year when the daily precipitation measured by AMeDAS was 200 mm or more**



- The number of days per year with daily rainfall exceeding 200 mm is increasing nationwide.

○ **Examples of repeated disasters at agricultural irrigation facilities**

Restoration

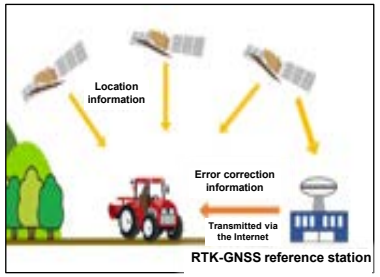
2. Future Direction of Agriculture and Rural Development

Infrastructure Development for Smart Agriculture and Production to Meet Demand

Infrastructure Development for Smart Agriculture

- From the perspective of improving productivity, **promote the introduction of smart technologies and other measures that contribute to labor savings for managing fields, consolidating rice paddies into larger plots, land readjustment and gentle sloping of farmland and orchards, and the developing information and communications infrastructure**

Large-scale division of rice paddies compatible with autonomous agricultural machinery



Installation of RTK-GNSS reference station required for autonomous driving of agricultural machinery

Development of Infrastructure to Promote Production to Meet Demand

- To shift to diversified farming and expand production of wheat, soybeans, and other high-yield crops, **promote the conversion of paddy fields to general-purpose farmland and the development of farmland**

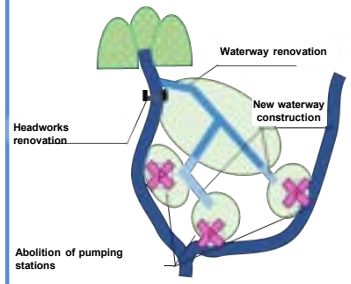
Vegetables grown in general-purpose fields

Switch to high-yield crops

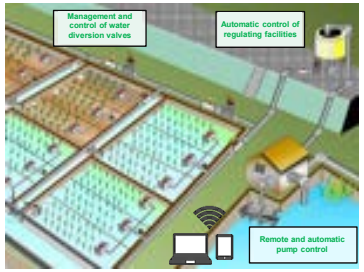
Conservation and Management of Infrastructure for Agricultural Production

Core Facilities

- **Consolidate and reorganize** facilities, **conserve energy, and promote the use of new technologies such as ICT**
- **Improve the level of facility management and establish a mechanism for the government to take swift action as needed**



Consolidation and reorganization of facilities



Introduction of new technologies such as ICT (Remote and automated water management)

Terminal Facilities

- Promote infrastructure **improvements that reduce labor in management, such as converting open waterways to pipelines, widening levees, and covering slopes**
- **Facilitate discussions and initiatives among various stakeholders such as** Land Improvement Districts (LIDs), municipalities, and villages **regarding the conservation and management of agricultural irrigation facilities** in the region

Conversion of open waterways to pipelines

Discussion on maintenance management of terminal facilities

Disaster Prevention and Mitigation, and National Resilience

Steady Promotion of Disaster Prevention, Mitigation, and National Resilience

- Proceed with planning methodologies based on future projections, and revise standards and regulations related to drainage
- For **priority agricultural reservoirs for disaster prevention, promote the early implementation of heavy rain countermeasures, such as flood spillway repairs,** to accelerate disaster prevention construction

Image of measures against heavy rain (repair of flood spillway)

Promote Improvements and Restoration Efforts Aimed at Preventing Disasters

- **Measures taken to allow for accident prevention measures, such as repairs when signs of sudden accidents are found, as well as improvement and restoration after disasters,** regarding "emergency projects" under the Land Improvement Act, which can be implemented without applications from beneficiaries

Reservoir embankment restored to original condition damaged again by heavy rain

2. Future Direction of Agriculture and Rural Development

Policy Objective 1: Reduce production costs through infrastructure development for farmland consolidation and intensification, and promote smart agriculture

- Reduction of production costs

- Labor cost reduction rate for rice production among farmers in areas where infrastructure development, including large-scale consolidation, has been implemented ⇒ [60% or more]

- **Percentage of projects that have started infrastructure development with facilitating smart agriculture ⇒ [100%]**

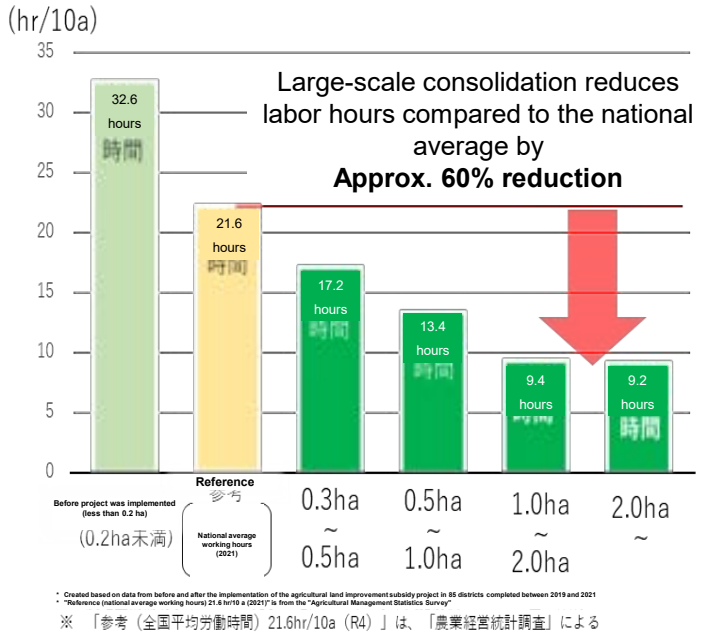
- Improve labor productivity through large-scale consolidation, etc.

- Infrastructure development to facilitate smart agriculture

Large-scale division of rice paddies

Large-scale division of farmland compatible with autonomous agricultural machinery

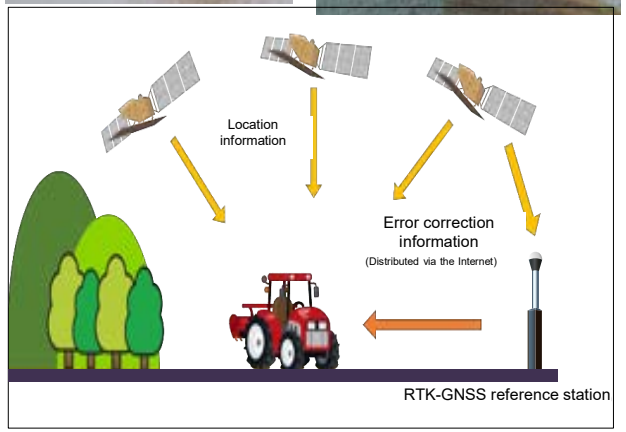
Rice farming labor hours by plot size



* Created based on data from before and after the implementation of the agricultural land improvement subsidy project in 85 districts completed between 2019 and 2021
* "Reference (national average working hours) 21.6 hr/10 a (2021)" is from the "Agricultural Management Statistics Survey"

※ 「参考（全国平均労働時間）21.6hr/10a（R4）」は、「農業経営統計調査」による

Installation of turning farm roads



RTK-GNSS reference stations installed to correct satellite positioning data and improve the accuracy of autonomous driving

Gentler slopes to facilitate the use of remote-controlled mowers

Installation of automatic water taps

3. Initiatives of Smart Irrigation Management

Case 1 : ICT Water Management System

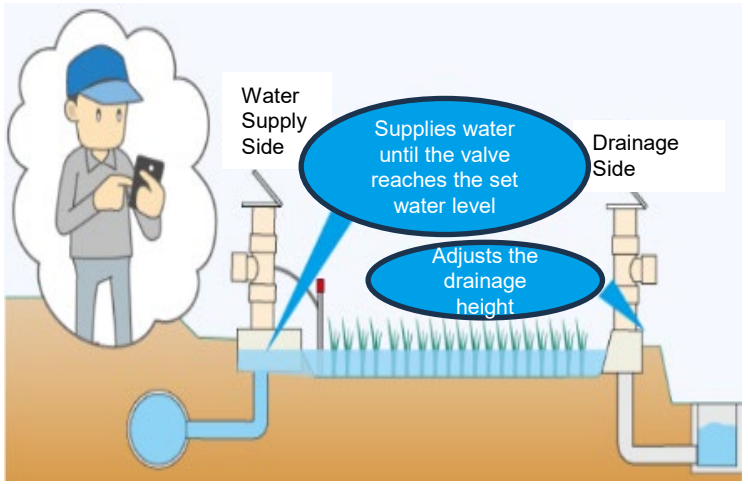
Merit

- Utilizing ICT water management systems helps minimize water usage for irrigation and maintain an optimal supply, effectively mitigating the impact of increased water demand caused by droughts.

- Automating water supply management, including overflow and reservoir control as well as nighttime and early morning irrigation, has proven effective as an adaptive technology to address high-temperature stress on crops.

► **"WATARAS"**
National Agriculture and Food Research Organization (NARO) and Kubota Co.,ltd products

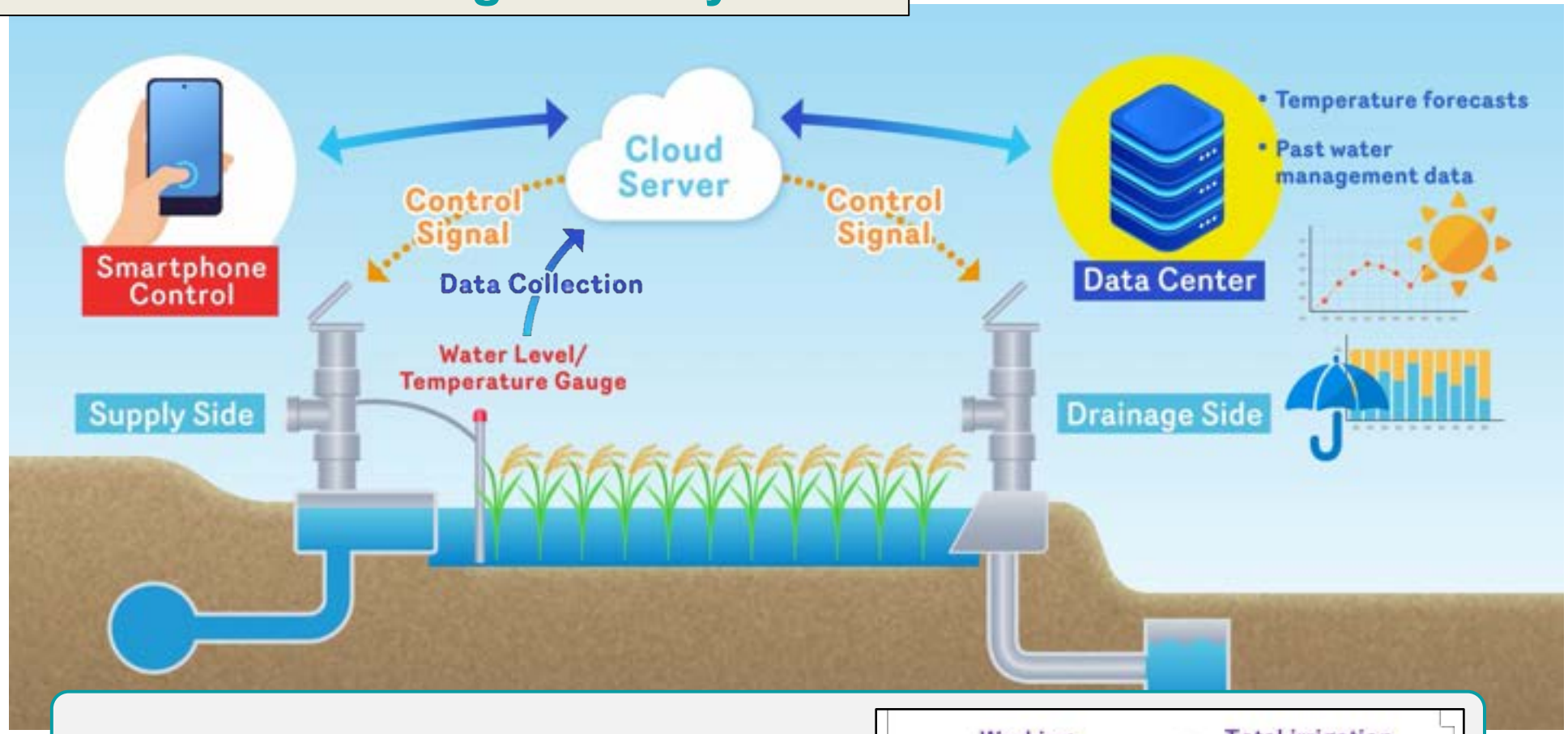
Remote-Controlled Water Supply/Drainage Outlets



(Source: Kubota Corporation Website)

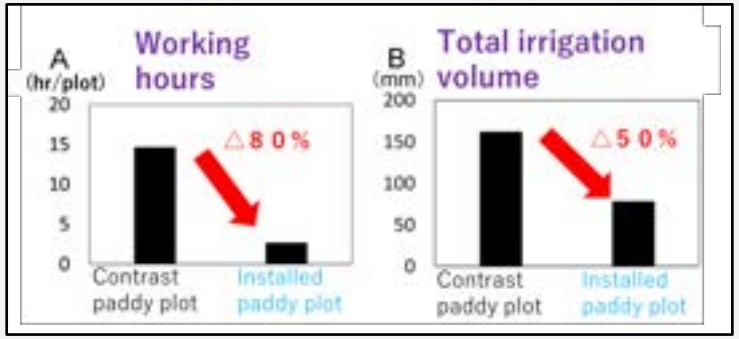
3. Initiatives of Smart Irrigation Management

Case 1 : ICT Water Management System



Expected outcome

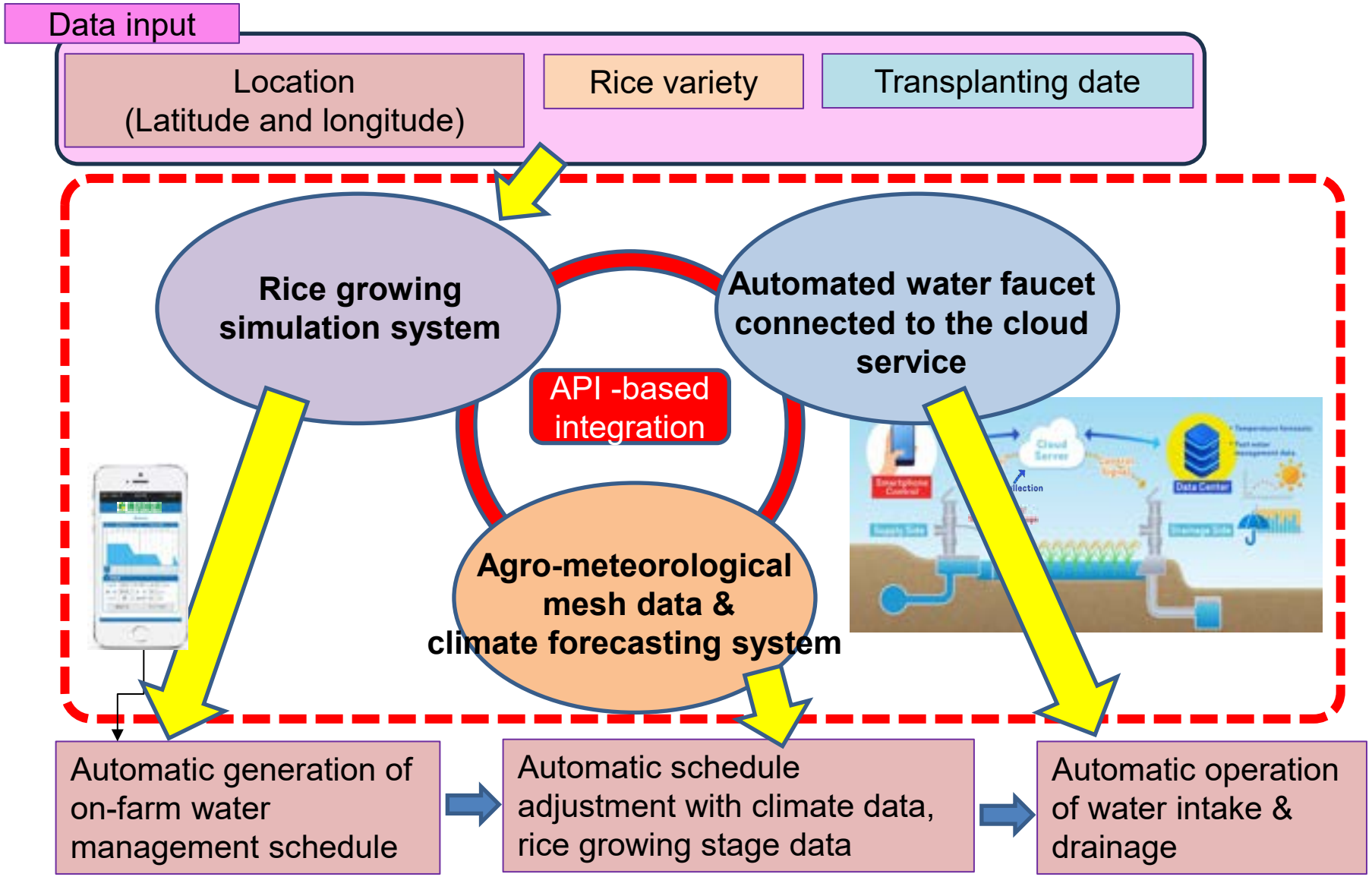
- Reduce workforce for water management
- Reduce excess water intake
- Increase rainfall effectiveness



(2015, National Institute for Rural Engineering (NIRE), National Agriculture and Food Research Organization (NARO), Japan)

3. Initiatives of Smart Irrigation Management

Case 1 : ICT Water Management System

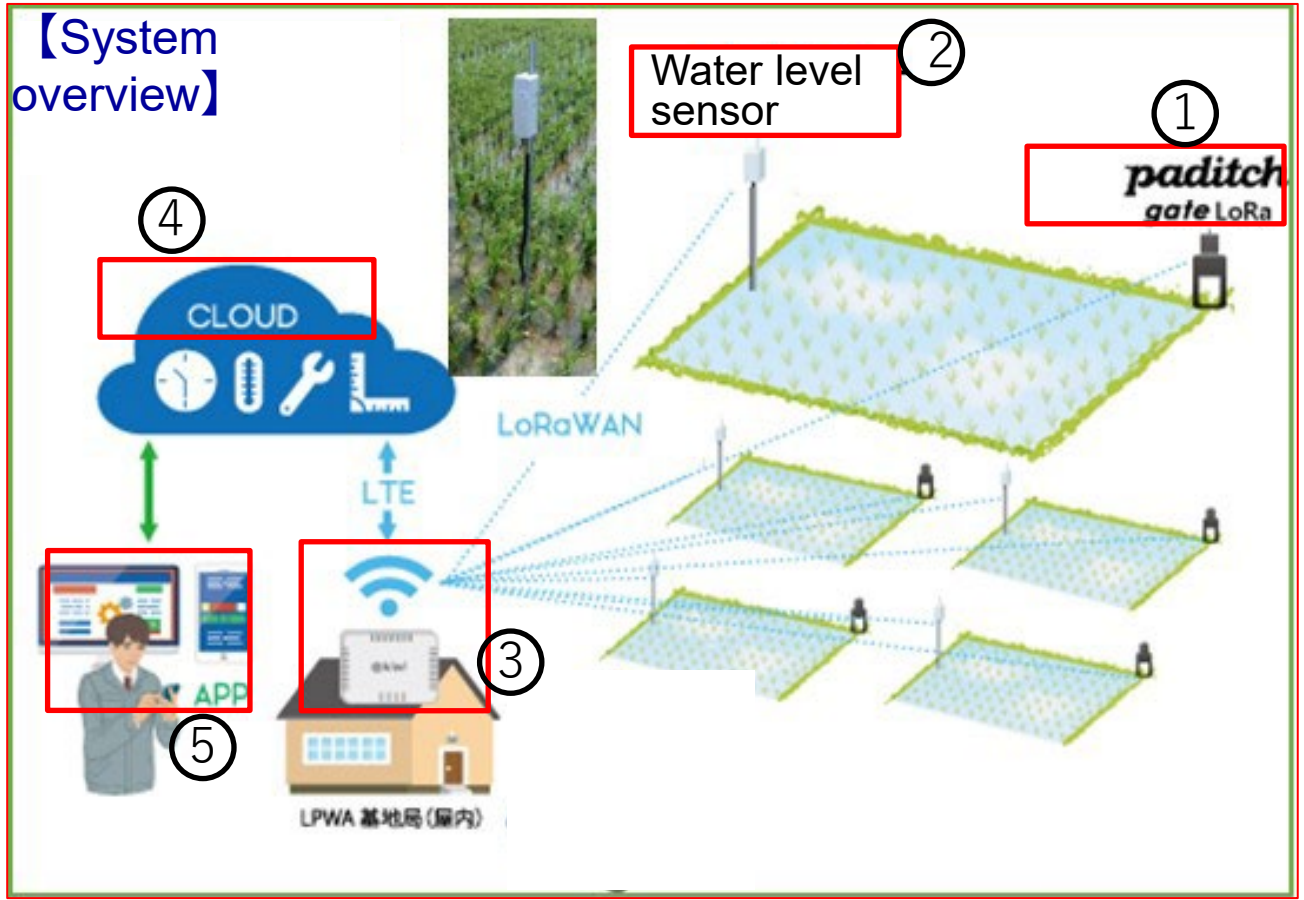


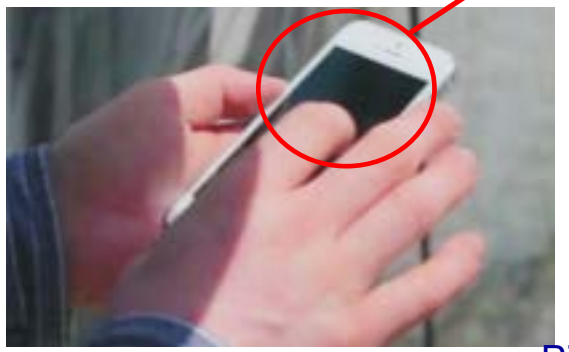
3. Initiatives of Smart Irrigation Management

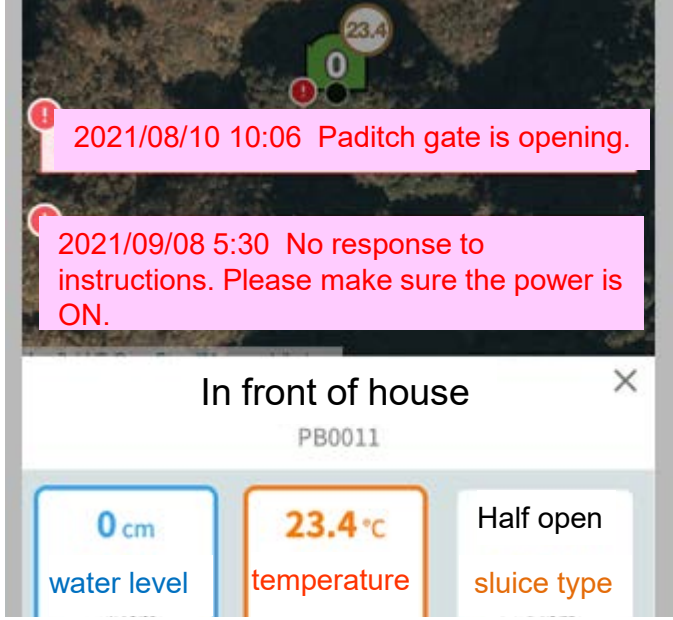
Case 2 : AWD Demonstration in Cambodia

▶ **"Paditch"**:
Enowa Co.,ltd products

✓ Operate the system based on water level information







Pic.1: An example of Smartphone Screen

▶ In the Paddy Field
① Paditch gate(Automatic sliding gate)
② Water level sensor

▶ Near the Paddy Field(indoor/outdoor)
③ Communication Station

▶ On the cloud
④ Cloud server

▶ Farmers/Supervisor
⑤ Smartphone application

3. Initiatives of Smart Irrigation Management

【Lum Hach area (Cambodia)】

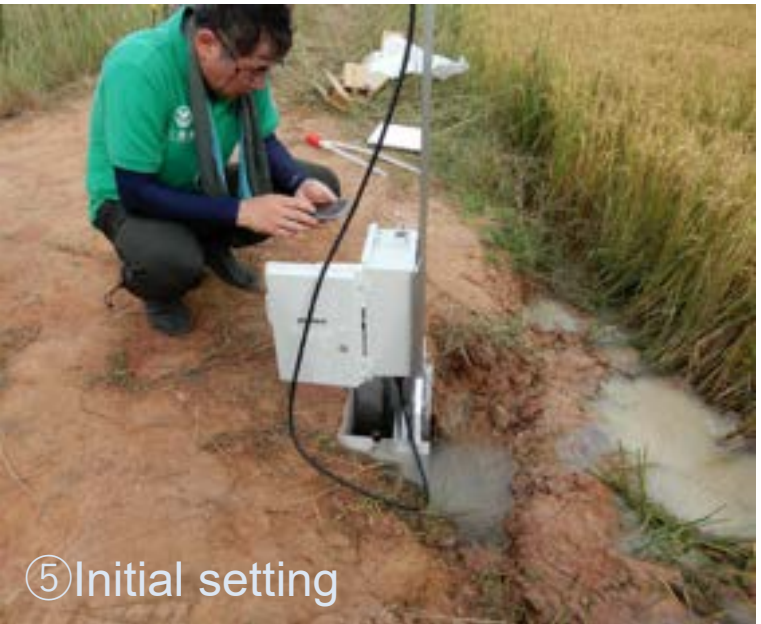
Case 2 : AWD Demonstration in Cambodia

①Before installing


②Concrete box


③Paditch gate


4 - Sensor


⑤Initial setting

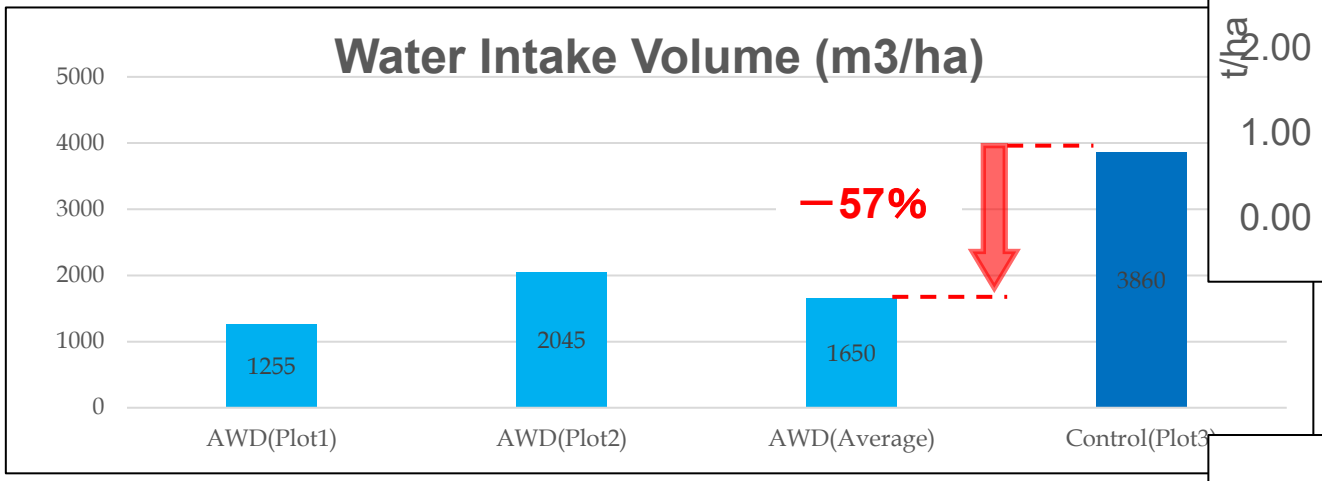

⑥After installing the system

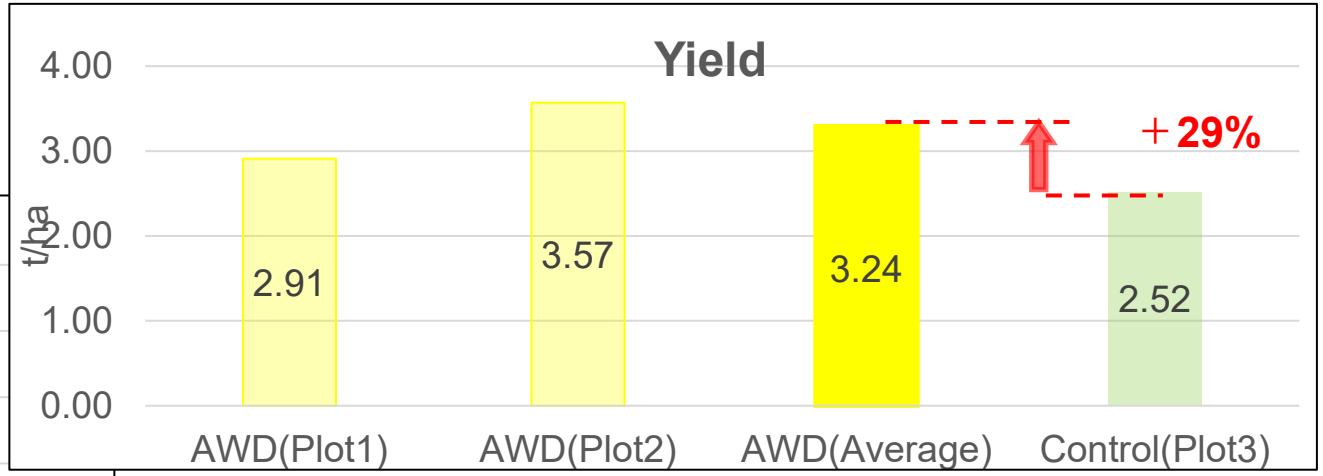

⑦Communication station

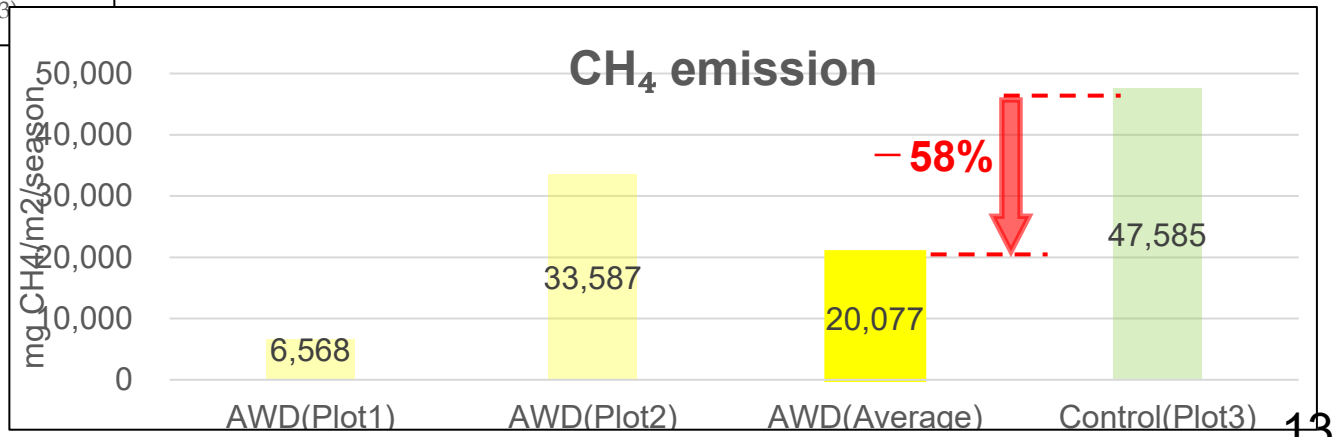
3. Initiatives of Smart Irrigation Management

Case 2 : AWD Demonstration in Cambodia

Tentative Outcome







Conclusion

- To address issues such as ageing infrastructure, declining population and climate change, in addition to infrastructure development, smart irrigation management utilizing ICT is crucial.
- Promoting sustainable agriculture in conjunction with other measures.

Thank you for your attention.