

60 R&D of development of strategic asset management technologies for trunk agricultural water facilities



Principal Investigator Isamu Nakajima (Head of Facilities Maintenance Unit, Institute for Rural Engineering, NARO)

Collaborative Research Groups Walnut Ltd., TRIBOTEX Co. Ltd., Kubota Corp., Reitaku University, Ishikawa Prefectural University, Fukushima Agricultural Technology Centre, Okayama University

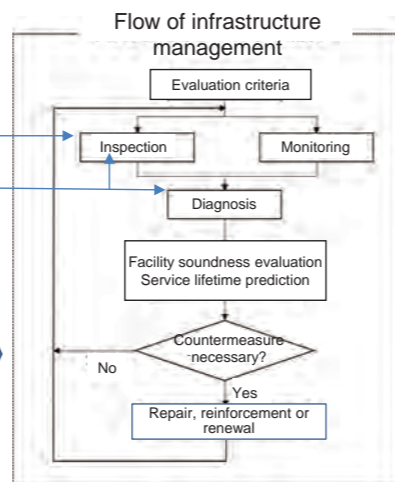
R&D Objectives and Subjects

Purpose of R&D

- To develop new inspection and diagnosis technologies to maintain the functions of agricultural water facilities, including a total of 400,000 km of agricultural water canals and about 12,000 km of pipelines.
- To develop a maintenance information database and a personnel development system in order to support organizations and technologists who maintain facilities.

Contents of R&D

- | | |
|--------------------------|---|
| Inspection and diagnosis | ① Development of technology to detect locations of leaks in water pipes |
| | ② Development of technology to monitor the state of and to maintain pumping equipment |
| Support technologies | ③ Development of systems to support preparation of trunk water facility renewal and improvement scenarios |
| | ④ Development of a method of providing information to pass on agricultural water facility management technologies |
| | ⑤ Building a personnel training and research network centered on local universities |

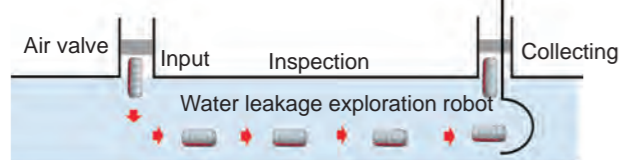


Current Accomplishments (1/2)

Inspection and diagnosis countermeasure technologies

- Development of technology to detect locations of leaks in water pipes

- Detection of water leakage position by small submarine type leakage exploration robot



Measurement precision of prototype leak investigation robot now being tested in an outdoor pipeline leak test field. Proving test underway on Miyakojima Island.

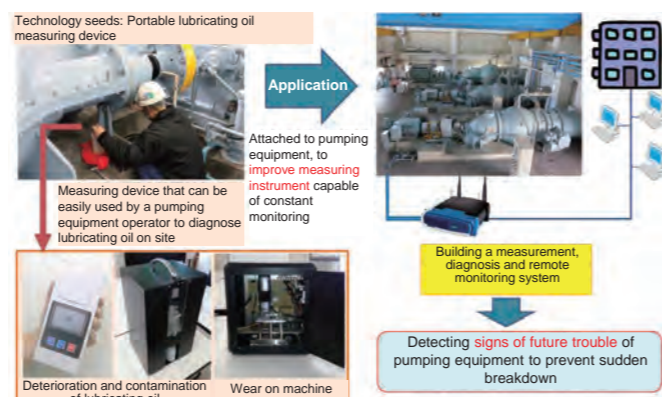
- Development of technology to monitor the state of and to maintain pumping equipment

Conventional method

Disassembly inspection of pump equipment (once every 10 to 20 years)

Development technology

Lubricating Oil Diagnosis method (oil extraction - analyze and quantitatively diagnose equipment deterioration)



Proving test equipped with measuring devices attached to drainage pumping stations at 2 places (Niigata, Aichi)

Development of methods of inspecting and diagnosing facilities that used to be difficult to inspect visually

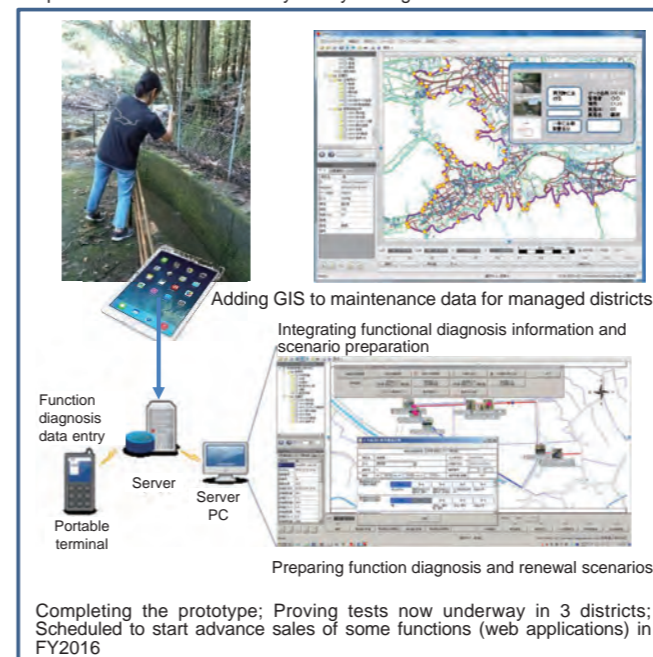
Current Accomplishments (2/2)

Maintenance organization support systems

- Systems to support preparation of trunk water facility renewal and improvement scenarios

- Method of providing information to pass on agricultural water facility management technologies

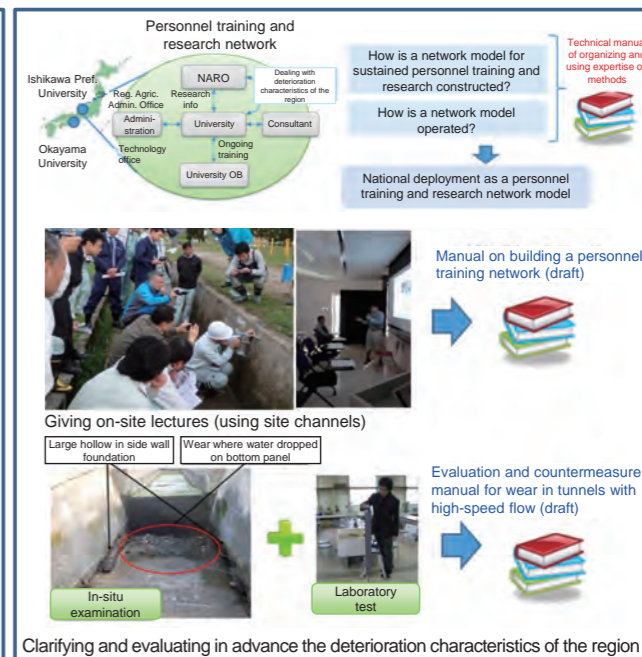
A web-based application to enable an iPad or cell phone to be used easily to build a GIS database of maintenance/disaster information accumulated in land improvement districts where day-to-day management of facilities is conducted.



Completing the prototype; Proving tests now underway in 3 districts; Scheduled to start advance sales of some functions (web applications) in FY2016

- Building a personnel training and research network centered on local universities

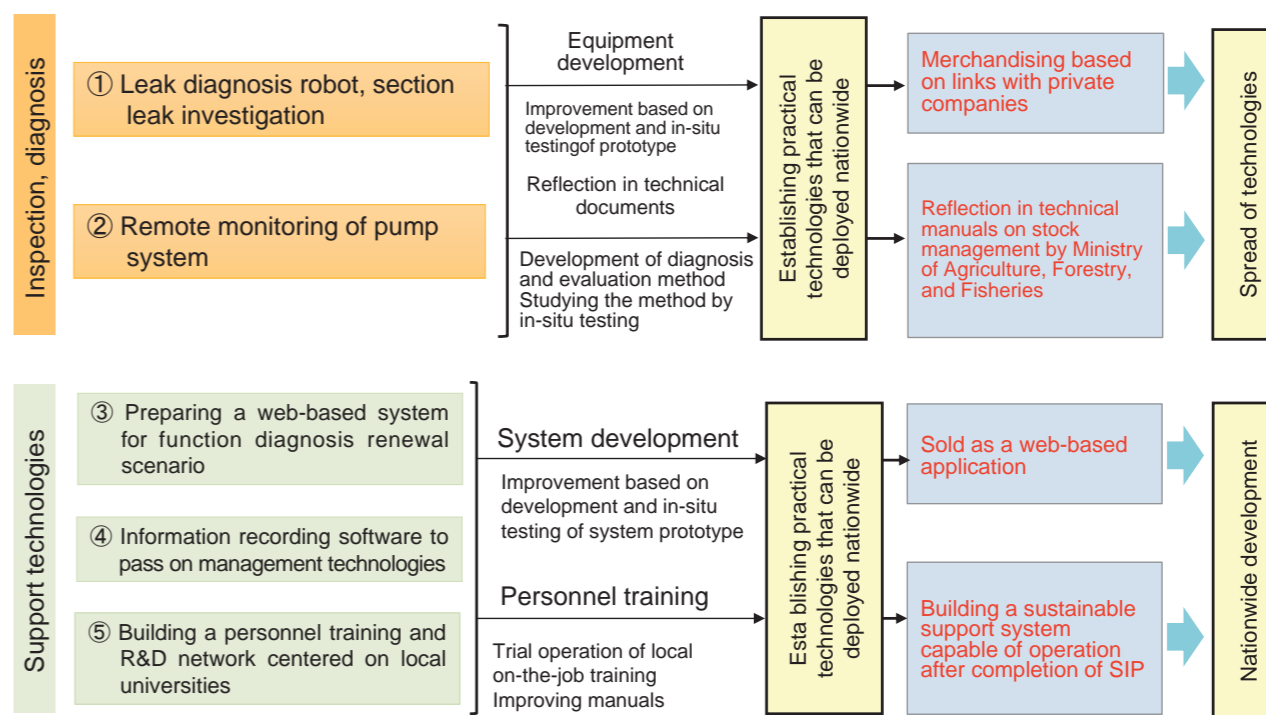
Building a personnel training and R&D network model centered on regional universities and contributing to regional asset management while creating organizations and preparing a technical manual containing expertise on operation methods



Development of support and personnel training system to prevent weakening of maintenance organizations

Goals

SIP development technologies are implemented as agricultural water facility maintenance technologies



Overseas development as maintenance technology for agricultural water facilities in Monsoon Asia