

## ベトナムと日本の政府・農民共同管理灌漑管理方式の比較研究 Comparative Study on Government-Farmers Joint Irrigation Management in Vietnam and Japan

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### 1. Introduction

Farmers' participation in irrigation management (PIM) has been recommended in developing countries. While, in larger irrigation systems, main and secondary canals are hardly operated by farmers. Therefore, it is recommended to establish joint water management (JWM) between the government and farmers' organizations. Sato et al. (2007) clarified a successful example of JWM in Japan involved collaboration between the Japan Water Agency (JWA) and Land Improvement Districts (LID). Several principles of irrigation management were mentioned in the study, including the partnership between the government and farmers (Kono et al. 2012). However, there is a lack of research on successful JWM in developing countries, particularly in terms of fair water distribution in large irrigation projects. This study aims to enhance JWM in Vietnam by comparing it to Japan's Government-Farmers Joint Irrigation Management, focusing on water distribution in a specific large-scale rice field irrigation area.

### 2. Methods

The study focused on the process of making seasonal irrigation plans and daily water allocation activities. This involved distributing water through secondary canals to farmers' organizations in both single and multiple communities. Additionally, the study compared the principles and challenges of managing irrigation systems with the water distribution management of JWA and LID, as defined in previous studies. The study collected data by conducting field surveys and interviews with various irrigation management representatives from the targeted system in September 2023 and March 2024.

### 3. Settings: Outline of study site

Bac Giang province, situated in the Northeast region of Vietnam, is home to the Cau Son-Cam Son irrigation system. The Bac Song Thuong Irrigation Management Company (IMC), a public sector, manages the head work, main and secondary canals built in the early 1900s, along with water facilities developed since the 1950s, such as pumps, small reservoirs, and water intake facilities serving areas larger than 50 ha (Fig.1). Rice is cultivated in two planting periods. Around 12,000 ha of rice crops are seasonally irrigated. The IMC is divided into four branch offices (Irrigation Management Enterprise – IME), each with Irrigation Stations - IS (total of 32 ISs) spread across the area. ISs collaborate with Cooperatives (private sector) established in almost all communes (local administrative organizations) to distribute water to farmers through secondary canals under its administration. The management of field irrigation canals is done by Cooperatives and the villages, the local communities.

The selected areas: G14 (1 Cooperative, 5 villages, 154 ha), G16 (2 Cooperatives, 6 villages, 260 ha), V3 (2 Cooperatives, 38 villages, 900 ha).



**Fig. 1** Outline of Cau Son-Cam Son irrigation system

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Participatory irrigation management (PIM), Irrigation management transfer (IMT), Joint Water Management, 参加型灌漑管理

## **4. Results**

### **4.1. Seasonal water allocation in main canals**

The IMC's seasonal irrigation plan is made based on seasonal cropping plan conducted by the province. Before the beginning of season, villages submit their agricultural plans indicating types of crops and cultivated area to the Cooperative and commune for approval and consolidation. This plan is then submitted to district and provincial level for the whole area cropping plan. Using the province's seasonal cropping plan, IMC calculates the required whole-area irrigated water based on cultivated area. IMC then signs seasonal contracts with 87 communes or Cooperatives, outlining the use of their irrigation services and specifying the schedule and amount of water for water distribution. For example, during peak water demand periods, such as land preparation and transplanting, IMC addresses the issue by rotating water among first-level canals on a 3-5-day basis.

### **4.2. Seasonal and daily water allocation in Single-Cooperative secondary canals**

IME and IS need to work closely together with Cooperatives to create a seasonal irrigation plan. Meetings between IS, and the corresponding Cooperative and commune are held at the start of the season to decide the plan. For instance, concerning the G14 canal, the meeting comprises five village leaders, the Cooperative head, three members of the Cooperative's irrigation team, the commune leader, and a representative from the IS. The heads of village and Cooperative compile a report on cropping conditions. Following negotiations among entities, a final plan for irrigation water, including schedule and quantity, is determined. Based on decided plans, IS staff with the help of irrigation team are responsible for the operation of division points along the secondary canal.

In daily water allocation, especially during abnormal droughts, regular communication occurs between public and private sectors. In particular, the village heads of G14 are responsible for reporting daily water usage condition to the head of their Cooperative. Then, the chairman works with heads of commune and IS to increase water supply or coordinate irrigation schedules between villages. The irrigation team of Cooperative follow these instructions from IS regarding the operation of division points. Telephone calls are

the most common method of exchanging information.

### **4.3. Seasonal and daily water allocation in Multiple-Cooperatives secondary canals**

Each V3 and G16 canal supplies water for two Cooperatives on the same canal. The seasonal irrigation plans are decided by both IME and IS, similar to other single-Cooperative secondary canals. However, there is no higher-level organisation that consists two Cooperatives. Thus, to reach a consensus on this irrigation plan, IME, IS and heads of communes, and Cooperatives have one-on-one meetings.

For daily water allocation activities, the head of the Cooperative is responsible for informing to the commune and IS heads, especially when villages notify them of a water deficit. In this case, IS then alerted the other Cooperatives, and created a plan for rotating irrigation along the secondary canal to address the shortage. Despite the use of discussions over the phone, the IS must still spend significant effort in one-on-one Cooperative agreements to divide water among Cooperatives.

## **5. Discussions**

In Vietnam, administrators are closely monitoring irrigation projects to ensure their success. Farmers can discuss with IMC to create seasonal irrigation plans and sign irrigation service contracts with them. The feedback system for farmers' opinions on the decision of the seasonal irrigation plan has been implemented in both main and secondary canals, in compliance with Japanese JWM principles. It is crucial to the effective operation of IMC's irrigation system since, for the most years, no water shortages have been reported.

While JWA, acting as an IMC, only works with meta-organisation (LID or WUA) on water allocation with final irrigation plan made by representative farmers. This system helps reduce the workload for the public sector. In Vietnam, without a meta-organization linking multiple Cooperatives along a secondary canal, IMC staff must conduct extensive individual negotiations.

### **References**

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- \*This work was supported by JSPS KAKENHI Grant Number 20KK0145, 22K05881.