

ウガンダ国の大規模水田灌漑地区における Joint Water Management An analysis of a joint water management in a large rice paddy irrigation scheme in Uganda

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1-Introduction

In Asian and African countries, the scale of farm management is as small as 1 ha, and the scale of paddy fields is smaller than 1 ha. Therefore, in the case of a large-scale irrigation scheme exceeding several hundred ha, it is necessary to distribute the irrigation water taken from rivers to more than 1,000 people and more than thousands of paddy fields. To increase the productivity of agricultural water in irrigated areas, it is necessary to achieve equal distribution of water among this large number of farmers and paddy fields, especially during droughts.

In the 1980s, the World Bank proposed a method of "farmer participation irrigation management (PIM)", and it was expected that equal water distribution could be achieved by leaving the water distribution management to the farmers. However, few projects have achieved this. Therefore, in recent years, it has been pointed out that it is necessary and important for the government to be directly or indirectly involved in irrigation management, rather than leaving it to all farmers (Satoh 2020). However, little research has been done on the specific methods and effects of such joint water management in Asian and African countries.

In this study, in Uganda, Africa, where paddy field development is being promoted in recent years, a case study was conducted in areas where the government is cooperating with farmers' irrigation organizations to distribute water to irrigation blocks, and equality is achieved. We clarified and considered the effects of government involvement in water distribution.

2-Method

Doho was selected as the survey area. It is a large-scale paddy irrigation scheme of 1000 ha with around 3820

beneficiary farmers. Data were obtained through field surveys and interviews between April and May 2020 at Doho Irrigation schemes. The interviewees were farmers chairman, block chairmen for irrigation blocks, the production coordinator, and Water Guards.

Data and information obtained for this analysis includes: Two most recent water distributions schedules, process of water schedule change, actual water distribution operation and situation of "water theft" by the farmers.

Climatic data obtained includes: Manafwa river flow from 1948 to 2014 & Rainfall from 1992 to 2014.

Using the information and datasets; the amount of water received in each block was calculated, the equality, functions of WUA and the functions of government were evaluated.

3. Settings: Outline of Doho irrigation scheme

The Doho was developed between 1976-89 as a paddy irrigation area for technology adoption with the support of the Chinese government. Government acquired all the land from farmers prior to development and later the developed paddy fields were leased back to farmers in the surrounding villages for a period of 99 years. Government staff together with Chinese experts managed all the water distribution in the beginning. After that, Political Instability made such water management difficult, and in 2000 long after the political turmoil in Uganda, DOSEFA (currently DIFACOS) was established as a farmer's irrigation organization. DIFACOS together with the central government office in Doho is responsible for handling water distribution from the weir to each irrigation block. Water distributions schedule has changed over five times and the water distribution in the irrigation blocks is left to the farmers in each block.

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There is dual cropping in Doho, irrigation period is from October to January and from March to August. Annual rainfall is around 129mm/month in the dry season. From October to October, the amount of water that can be taken from rivers in the Doho area is 10 mm/d or less, and there is a year in which it lasts for more than a week once every few years, resulting in a shortage of water.

4-Results and Discussions

1) Water distribution by block rotation system

Currently, water is distributed to each block-by-block rotation with one cycle per week. With block rotation schedule for 2016 and 2021, the daily available water for each block were calculated on weekly basis and equity evaluated. The difference in the amount of water that can be taken between the upstream block and the downstream block between 2016 and 2021 has decreased from 0.47 m³/sec to 0.08 m³/sec. this, implies the change in the water supply method is improving toward equal water distribution. This is also consistent with the result of the interview survey, "The water distribution method was changed because there was a shortage of water in blocks 2B and 6B (blocks in the downstream area)."

2) Process of determining / changing water distribution plan

When water shortages occur within the blocks, farmers complain to change the distribution schedule is channeled to water management committee (Elected by farmers) through the block chairman and strip leaders. The water committee together with Government staff at Doho formulates new water distribution plans in consultation with farmers through their respective block chairmen. The new plan will then be approved by the 5 members board of directors and subsequently forwarded for farmers approval at the AGM.

The farmers themselves are responsible for the central part of the process of creating and executing the water distribution plan (decision making, operation, monitoring, feedback) necessary for equal water distribution (Satoh et al. 2007). In this process, the government's roles are not limited to technical support, still leading farmers to make a schedule matching the government's goal of improving

productivity in the entire scheme by equitable water distribution.

3) Government enforcement of water distribution plans

Enforcement of water distribution schedules is done by government office in Doho. At 6 o'clock every morning, water is distributed by two water guards who are watched by farmers who often come to their gardens by 5.30 am, farmers sometimes complain to them, but he does not have the authority to change the water distribution on-spot after farmers complains but rather forward farmers complain to production coordinator. The operation by government officials is significant and trusted as a third party to distribute water fairly between blocks. In this context, power of government agencies as well as DIFACOS can be utilized in water governance.

Water can be stolen at night without water guards or farmers' supervision. However, the frequency is at-most 5 to 6 times / season, the methods are minor that can easily be restored like; blocking gate with banana stems or turning the spindle with a spanner to open the gate. The gates and waterways have rarely been destroyed. Farmers understand equal water distribution is the principle, and the Bye Law also stipulates penalties, so it is possible that farmers share the consciousness that water theft is a crime.

5- Conclusion

Improving equal water distribution between irrigation blocks is achieved through joint government-farmer collaboration to determine and feed back water distribution plans, government operations and farmer oversight. It has a structure very similar to JWM in Japan's Water Resources Organization reported in Toyogawa Irrigation (Kono et al. 2012). In the future, achieving equality within the block will be an issue.

Reference

- Kono K et al. (2012) Participatory system for water management in the Toyokawa Irrigation Project, Japan, Paddy and Water Environment, 10(1), 75-81
- Satoh M et al. (2007) Principles and Methods for Participatory Irrigation Management, J. of JSIDRE, 75(7), 53-58
- Satoh M (2020) Japanese Model of Participatory Irrigation Management and Its Implications, 8 TH Asian Regional Conference