

# Keynote Speech

## Necessity and methods for participatory irrigation management

Masayoshi Satoh  
Professor, Dr. Graduate School of Life and Environmental Sciences, University of Tsukuba,  
Ten-no-dai 1-1-1, Tsukuba, Ibaraki, 305-8572 Japan,  
E-mail: [massa@sakura.cc.tsukuba.ac.jp](mailto:massa@sakura.cc.tsukuba.ac.jp)

### Abstract

This is to discuss the necessity and methods for Participatory Irrigation Management (PIM) with a main target of Monsoon Asian region; what can be the purpose of PIM, who needs it, and how it is realized. First, the Law of Diminishing Return is introduced to explain the relationship between the efficiency of an irrigation project and equal water distribution. Second, background is given on how to obtain the cooperation of farmers to show that cooperation is possible when the farmers are convinced that cooperation is beneficial to them. Third, the water distribution process is divided into four sub-processes of decision making, operation, monitoring and feedback. It is shown that governments and farmers need to properly share functions based on the four sub-processes, according to each irrigation facility at the main, lateral or on-farm level for the success of PIM.

**Keywords:** "Irrigation management", "Farmer participation", "Cooperation", "Decision making", "Water distribution"

### 1. Introduction

The world's irrigation area was 94 million ha in 1950, and tripled to 276 million ha in 2000. This is a result of irrigation development, and can be viewed as a great achievement towards the more stable and increased production of food. However, efficiency and sustainability in irrigation management are a challenge, especially in developing countries. The present problems of irrigation management are mainly related to modern irrigation projects that have been developed after World War II, most of which are in Asia, Africa and Latin America, where many small scale farmers have to share an irrigation canal. This paper aims, based on the author's experiences in Southeast Asian countries as well as in Japan, to discuss basic ideas for the success in PIM.

#### 1. Problems of Water Management in Monsoon Asian Countries

One of the special characteristics of the water management situation in East and Southeast Asian countries, including Japan, is that a large number of small scale farmers are the beneficiary of a project. The farmers inevitably have to be both users and managers. Government officers have been the official managers of irrigation systems in most countries and are achieving low performance. An important discussion point is expressed in the slogan, "From government to farmers." Should the ultimate goal of PIM therefore be to transfer everything to farmers? We need the understanding of goals and methods to achieve good water management.

#### 2. Different Goals of Water Management for Governments and Farmers

Investments in irrigation development are done mostly by governments, who mainly look for the highest economical return from irrigation development. The broader targets of a government, such as poverty alleviation and increased social stability may accompany the project. However, you have the farmers, each of whom will endeavor to make the maximum profit from the water flowing in front of them. An important point to note is that the efficient and sustainable use of an

irrigation project is out of the direct purpose of individual farmers' performance. Our observations of irrigation projects in Asia and Africa has led us to conclude that the maximum benefit to the government is not realized if irrigation management is transferred to farmers with no intervention from the government.

#### 3. Target of Water Distribution

If the major target of water management is to gain the maximum yield under the given irrigation condition, we need to know what water distribution will gain the maximum under a given amount of water. The Law of Diminishing Returns, when applied to the relation between irrigation and crop yield, suggests that the maximum benefit of irrigation is realized when the available water is allocated equally among individual plots in the project area. This may show that the major target of water management should be equal water allocation, though it is abstracting some minor conditions such as the scale of the project, crop stage, soil conditions, and so on. However, equal water distribution may reduce benefits of some local farmers. We have to suppress the benefits of some local groups for the sake of the whole, if we try to maximize the benefit for the whole or the government.

#### 5. Is Farmers' Cooperation Possible?

Even having the government's goals as the target, our experience has shown that governments cannot manage every facility by themselves because of budget constraints, and a limited capacity to prevent farmers from performing illegal actions on the facilities the government is trying to control. Governments need to invite farmers to achieve the government's target. How can the government realize participation of farmers while achieving its target? Farmers need to be organized and behave according to specific rules for the facilities. Seeing strong conflicts among farmers in every region, we face a fundamental question of whether or not establishing farmers' groups and gaining their cooperation are possible in principle. The authors' idea is that despite the conflict, or rather because of it, farmers

may opt to establish their own water user group and organization. The simultaneous establishment of WUGs and IWUG is recommendable under the conditions of information dissemination and accountability for water situation.

#### **6. Role Sharing by Government and Farmers**

Water management consists of operation, maintenance and management, among which operation can be regarded as the core of water management because it is an action that directly brings farmer benefit. Thus, operation may be called water management (in the narrow sense). The other two kinds of activities have rather supplemental functions for operation. The author suggests a classification of water management (the narrow sense) into four sub-processes; decision making, operation (narrow sense), monitoring and feedback. We need to consider the role sharing of the above four sub-processes between government and farmers for each irrigation facilities at the main, lateral and on-farm levels.

#### **7. Methods for PIM**

To realize farmers' participation in water management for the whole irrigation system, a water user organization for the system needs to be formed, and must be supported by a hierarchical farmer group system that covers every farmer in the system. The challenge is how to set up and sustain such organizations.

The farmers would have no expectations about the projects if they have not participated in the initiation, planning, or design. They feel no ownership of the project. The farmers do not understand the reason for their unfavorable situation, and cannot expect government officers to take effective action for them. This is principally because of lack of information disclosure to farmers.

To realize the proposed role sharing between government and farmers, the following are of special importance:

- 1) The government openly declares, after establishing its own goals, that beneficiary farmers have equal rights in the system, and that these equal rights are one of the principles in water management.
- 2) The government establishes a forum for local hydraulic groups to discuss and decide water management according to the equity principle.

Through the above mentioned roles in and the contribution to water management, farmers can have ownership in their irrigation project. The majority of beneficiary farmers would understand that equitable water distribution is necessary and can be realized by their cooperation.

The participation of farmers in the decision making process is the most important and may attract the most serious discussion. There is a strong traditional attitude among government officers that they, being highly educated, should hold the power to make decisions. However, if governments do not allow farmers to participate in decision making for water distribution, then they cannot expect farmers to cooperate in other aspects of the water management. Governments can achieve their goals more effectively by letting the farmers join in the decision making process, which would be more rational if

all the information is shared together in the discussion. We can expect favorable effects on farmers' behavior in monitoring and feedback processes, as well maintenance and management. It is because farmers realize the necessity and responsibility for such activities, thus feeling ownership.

#### **7. References**

- [1] Brown, L. R, State of the World 1999-2000, Japanese version, Diamond inc., 1999
- [2] FAOSTAT:  
<http://faostat.fao.org/site/419/DesktopDefault.aspx?PageID=419>
- [3] Fujiki, T., M. Satoh, P. Sopaphun and V. Vudhivanich, Water Management Practice in Upper Chao Phraya Delta, Thailand -Analysis of water use in the Borommathad Irrigation Project-, Transactions of Irrigation, Drainage and Reclamation Engineering, 2001, pp.216, 1-7
- [4] Gautam, U., Classification on the West Gandak Experience in Nepal, INPIM, No. 6, 1997, p. 7,
- [5] Groenfeldt, D., and M. Svendsen, Case Studies in Participatory Irrigation Management, World Bank Institute, 157 pp., Washington, D.C. 2000
- [6] Hussein, I., E. Biltonen and K. Yokoyama: Identifying Pro-poor Irrigation Interventions for Irrigated Agriculture in Asia, 18<sup>th</sup> Congress on Irrigation and Drainage Vol. 1A, 2002, pp. 20-23
- [7] INPIM:  
<http://www.inpim.org/leftlinks/FAQ/Topic%20Page/PIM>
- [8] Ishii, A., T. Ounvichit, Y. Ren and M. Satoh The Actual State of Farmers' Cost Sharing in Small Scale Pumping Irrigation Projects in Monsoon Asia, (in Japanese with English abstract), Transactions of Irrigation, Drainage and Reclamation Engineering, 73(4), 2005, pp. 25-34
- [9] Onimaru, T., M. Satoh, K. Kawsard and K. Shioda 2003: The Present Situation and Problems of the Establishment of Water Users Organizations in the Chao Phraya Delta, Transactions of Irrigation, Drainage and Reclamation Engineering, 225, pp.119-126
- [10] Ostrom, E.: Crafting Institutions for Self-Governing Irrigation Systems, ICS Press, 1992
- [11] Ounvichit, T., M. Satoh, S. Chantanusart and K. Yamaoka Cost sharing and sustainability of Pongsak Muang Fai irrigation system, Paddy and Water Environment, 4, 2006, pp. 81-88
- [12] Sato K. and M. Satoh An Organizational Structure for Effective Farmer Participatory Irrigation Management in Irrigation Projects in Ghana (In Japanese with English abstract), Trans. of Japanese Society of Irrigation, Drainage and Reclamation Engineering, 245, 2006, pp. 85-93
- [13] Shinzawa, K., Irrigation development and management in Japan, "Nogyo Suiri Ron" (in Japanese), pp. 1-10, Tokyo University Press, 1955
- [14] Vermillion, D. L. Impacts of irrigation management transfer: A review of the evidence. Research Report 11, 35 pp., International Irrigation Management Institute, Sri Lanka, 1997