

Workshop Report

Regional Workshop on Water Saving Irrigation Practices in Rice-based Canal Systems, Bangkok, Thailand, 8–9 October 2009

Improved management of water resources in agricultural operations is a basic requirement for coping with water scarcity at basin, community, and farm levels. Agriculture is the major user of water in many basins; irrigated lowland rice, for example, receives about 40% of global irrigation water, equivalent to 25% of total freshwater withdrawals. Furthermore, agriculture is under pressure to increase food production even as it competes for water from other users, such as cities, industry, energy and the environment. Water productivity, therefore, needs to be improved under increasingly limited water supplies using water-saving irrigation practices.

Opportunities and practices for coping with water scarcity in rice-based irrigation systems have been identified at the field and system levels by national and international research and development organizations. However, operationalization of these practices may be constrained by the requirements of a relatively high level of technical water control and governance. Furthermore, the long term sustainability of some of these practices, and the impacts on surface and groundwater systems, productivity, ecosystem services, and environmental conditions, is uncertain, which, in combination with the location-specific nature of these practices, calls for more research and testing.

Accordingly, a Regional Workshop on Water Saving Irrigation Practices in Rice-Based Canal Systems was held from 8–9 October 2009 at the Asian Institute of Technology in Bangkok, Thailand. The objective was to review water-saving issues and experiences in medium and large rice-based canal irrigation systems in order to identify knowledge gaps and foster international collaboration on exchange of experiences, research, education and development. The workshop was jointly organized by the University of Copenhagen, Denmark and the Asian Institute of Technology, Thailand, and co-sponsored by the Danish Water Forum (DWF) and the International Research School of Water Resources (FIVA). It was attended by about 50 participants comprising scientists, practitioners, development experts and PhD students. The workshop was preceded by an international PhD-level short course on Advances in Agricultural Water Productivity Assessment and Improvement in Irrigation Schemes. Participants included PhD students from South Asia, Southeast Asia and Europe, organized in collaboration with the Food and Agriculture Organization of the United Nations (FAO), the International Rice Research Institute (IRRI), and the Royal Irrigation Department, Thailand (RID).

The 20 papers presented addressed the three main themes of the workshop: (1) water-saving issues and opportunities at the system level; (2) field level water-saving opportunities and their implications for performance in rice-based irrigation systems; and (3) governance and policy measures for coping with scarcity and facilitating water saving in medium and large irrigation schemes and in river basins.

Under the first theme, presentations covered: (1) water-saving irrigation approaches in paddy production in Sri Lanka; (2) the role of groundwater in irrigated farming in South Asia and China; (3) the comparison of water use and productivity between farmer-paid pump irrigation and publicly managed surface irrigation in the Philippines; and (4) assessment of irrigation sustainability of selected projects in Thailand.

Presentations for the second theme included: (1) water saving and cost reduction in Boro rice in Bangladesh with alternate wetting and drying (AWD) irrigation technology; (2) water productivity for the rice crop in Pakistan; (3) alternative techniques of water saving for lowland rice cultivation at the tertiary level; (4) analysis of optimum cultivation practices for rice grown in a rice-based irrigation canal system in Vietnam; and (5) development of cost-effective water-saving technologies for rice production in Bangladesh.

With respect to the third theme, presentations covered: (1) the application of participatory irrigation management (PIM) for improving canal management in the Red River Delta in Vietnam; (2) up-scaling water-saving AWD irrigation technology in Bangladesh; (3) enhancing the adoption of AWD and other water saving technologies in irrigated rice production areas in the Philippines; (4) environmental implications of water saving irrigation at a selected irrigation scheme in China; (5) application of the WEAP model in water allocation planning at the basin level in Thailand; (6) responding to the challenges of Asian irrigation in transition; and (7) innovative technologies and management for water saving in agriculture.

Issues and recommendations related to each of the three themes were raised and discussed in detail in the two sessions allocated for group work discussions. Results of the group work and discussions were presented and discussed at the penultimate session. The concluding session summarized the outcomes of the workshop.

Following the presentation of papers, group work and discussions, the participants agreed at the concluding session on the following observations and recommendations.

- (1) Water scarcity is a real issue facing agricultural water management. In addition to the drivers of population growth and increasing demands from various competing sectors, overbuilding of basins with unbalanced and uncoordinated storage and water use schemes, often with internal distribution problems, has led to an undesirable 'artificial' water scarcity within some parts of the schemes and basins.
- (2) Water-saving measures, at the field and higher scales, need to be based on a thorough understanding of water balances, and linkages between surface and groundwater, flow pathways and beneficial and non-beneficial uses of water, both within and beyond the particular scale considered. Failure to recognize these aspects has in the past often resulted in overestimates of the potential for 'real' water savings. Furthermore, these measures are likely to have implications on equity and ecosystem functions and energy use.
- (3) Water-saving irrigation practices, including alternate wetting and drying (AWD) techniques, should be promoted where applicable. These techniques should be integrated with water banking and storage management to realize the maximum potential of water saving and increased water productivity. Service and infrastructure requirements of these techniques need to be identified and applied. The impacts on soil and water quality need to be better understood, and the applicability of the techniques in more marginal areas needs to be

assessed—for example, salinity risks and high evapotranspiration. Up-scaling requires an understanding of the potential constraints for farmers to use these practices within the context of present and future household economic conditions, especially labour availability and requirement.

- (4) Adoption of water-saving measures will require a framework of incentives for farmers and water managers, and improved flexibility and reliability of water services. Water pricing in itself is not likely to provide an incentive in irrigation canal systems in Asia, save where volumetric management and pricing is combined with supporting infrastructure and suitable institutional arrangements. However, payment for water is useful as a basis for establishing a service agreement between water supplier and user. Systematic assessments of present water management practices at all levels, from farm to bulk supply, are required to identify easy and feasible options for improving the flexibility and reliability of service.
- (5) Supporting policies and capacity-building, including the training of farmers and managers, are required to disseminate water saving practices on a larger scale. Awareness needs to be raised among policy makers on the issue of water-saving irrigation, and irrigation investment strategies should include measures for the adoption of water-saving irrigation techniques at the farm level.

In general, the workshop was successful due mainly to inputs from, and active engagement of, the participants and the constructive discussions. With adequate time devoted to discussions, the level and quality of discussions were high. The setup for group work and discussions also provided the PhD students with more opportunity to openly express their ideas and interact closely with experts in the field.

The papers presented at the workshop are currently being considered for publication in an international journal as a special issue.

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