Water accounting in practice: From basin to field-level applications and training

As the agriculture sector represents 70% of water withdrawals, relevant agricultural water management and planning decisions must be based on good quality information and a sound understanding of the local context.

It is often assumed that (i) investments in irrigation modernization will save large quantities of water that can be released for other uses including the environment, and (ii) water savings lead to increased productivity. This assumption underpins many of the existing lending programs by multilateral agencies. However, current studies into the validity of these assumptions are inconclusive, and there is a lack of evaluation of the impacts of high-efficiency irrigation systems at field and basin scales. Water accounting fills this knowledge gap by providing quantitative estimates of the water balance (sources, diversions, withdrawals, consumption, return flows, changes to storage) and quantifies biophysical changes that result from different irrigation interventions.
Adaptive scaling to achieve system transformation in One CGIAR

The Water Accounting in Practice: From Basin to Field-level Applications and Training project aims to achieve the following specific objectives:

1. Promote the use of multi-scale water accounting tools (from field to basin) to demonstrate their usefulness in supporting project investment, designing policy interventions, their appropriateness in understanding experiences of water insecurity, and bringing water use, access and consumption within sustainable limits through pilot applications.

2. Use water accounting and productivity (WAP) approaches and socioeconomic data to develop and implement a monitoring and evaluation (M&E) framework to inform the impact of irrigation investments.

3. Build local and national capacity on water accounting concepts, approaches and tools, and the interpretation of data and outputs for improved irrigation water management.

4. Develop a detailed technical report on water accounting approaches and tools used in the pilot study to guide international and national partners to adopt, implement and practice water account modelling and enable users to easily apply, interpret and analyze water accounts at various scales.

The development of approaches and tools to enable consistent and efficient data analysis is integral to the preparation of water accounts. These must be scalable to suit regions of varying sizes and data availability.

Project engagement

Funded by the Australian Water Partnership, the International Water Management Institute (IWMI) will conduct multi-scale water accounting and productivity analysis to establish a baseline for water use and agricultural productivity (Figure 1). The Australian partner, Alluvium, will bring Australian experience to monitoring and evaluating irrigation investments, contributing to field data collection, conducting socioeconomic evaluation, and contributing to training and capacity building. The IWMI-Alluvium partnership will bring added value through (i) demonstration of the multi-scale application of WAP analysis in the pilot areas; (ii) combining remote-sensing approaches and socioeconomic data for M&E of the selected irrigation projects; (iii) impact of gender equity and social inclusion on the management of water resources; and (iv) provision of all necessary tools and techniques for capacity building of stakeholder groups (farmers, water user association groups, irrigation scheme managers, and state and central government departments).

IWMI has identified the West Bengal Accelerated Development of Minor Irrigation Project (WBADMIP), Government of West Bengal in India as the vehicle to pilot, validate and showcase water accounting approaches. The aim of the WBADMIP project is to increase agricultural production for at least 100,000 farmers, particularly small and marginal farmers in rainfed single cropped areas of West Bengal. This will be done by providing assured irrigation facilities to cover an area of 75,000 ha.

From the irrigation schemes (minor, medium and major) built under WBADMIP and irrigation and waterways department, IWMI has selected some schemes for detailed monitoring and evaluation study under this project. The water accounting and productivity analysis will identify changes in hydrological (water use and availability, water use efficiency), biophysical (water productivity, biomass production, yield) and socioeconomic (income, livelihood, property values) for pre-investment and post-investment time periods.

The multi-scale water accounting and productivity tools developed in this study provides a rapid and cost effective approach to understanding the impact of irrigation investments.

Contacts

Alok Sikka, Country Representative – India, IWMI, New Delhi India (a.sikka@cgiar.org)
Naga Velpuri, Senior Researcher - Water Accounting and Productivity, IWMI, Sri Lanka (n.velpuri@cgiar.org)
Karthikeyan Matheswaran, Researcher - Water Productivity, IWMI, Sri Lanka (k.matheswaran@cgiar.org)
Smaranika Mahapatra, Research Officer - Water Resources Management, IWMI, New Delhi India (s.mahapatra@cgiar.org)