



III World Water Forum

Water, Food and Environment

Groundwater Governance in Asia

The Challenge of Taming a
Colossal Anarchy

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IWMI Website:
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V. MORE CROP PER DROP: CAN MICRO-IRRIGATION HELP ALLEVIATE GROUNDWATER DEPLETION?

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'More Crop per Drop' aims at enhancing production per unit of water use. While farm-level benefits of micro-irrigation technologies have widely been studied and illustrated, there is still a large question looming on whether their adoption can actually lead to water saving at the system level. In the classical model of irrigation efficiency, all water applied is treated as consumed or lost while the integrated basin view of irrigation efficiency views only the effective evapo-transpiration as the irrigation loss. In either case, increased water efficiency at farm/individual level would not lead to water saving at the system level unless higher farm efficiencies are achieved all across the system. Thus, unless the adoption of micro-irrigation is scaled up, it would not make any significant contribution to alleviating groundwater depletion and related problems.

Even after more than three decades of promotion by various government and non-government agencies, the spread of micro-irrigation in India is miniscule. The limited growth of micro-irrigation technologies in India can, to a large extent, be explained by the apparent gap between what has been marketed and where the demand lies. Over the years, agencies have been promoting micro-irrigation as a 'new concept in agriculture' through a "package solution" with the following salient features: [1] water saving; [2] good pay back period and internal rate of return; [3] customized and highly sophisticated technology; [4] higher yields and better quality of output; and [5] labor saving. The farmers, on the other hand, have different priorities and they demand solutions and technologies that would provide them: [1] assured returns; [2] lower costs; [3] simple technology; [4] generic applicability; and [5] higher and better yields with lesser pumping hours.

This gap between what the consumers demand and what is being currently marketed can broadly be addressed through the following policy prescriptions:

Figure 9



1. Shifting Micro-Irrigation Technologies from Investment Mode to Input Mode:

There is a need to view micro-irrigation technologies as recurring but much lower input costs rather than capital investments that offer returns over the next 8-10 years. If the small farmers are to be targeted, policy makers in promoting agencies must understand that they would be hesitant in making huge-capital investments in new technologies unless they are very sure of their results. Even when they are convinced about the returns, they might not be in a position to incur the huge capital costs due to poor access to good quality credit options.

2. From Custom-Solutions to a Package Solution to Farmer-Assembled Systems:

The market for Micro Irrigation products is experiencing its second major shift today. From the highly sophisticated custom built drip irrigation solutions for the large farmers, the technology shifted towards Package Solutions provided in the form of drip-kits popularised by IDE in the form of bucket-drip-kits and micro-tube-kits and the recent family-drip-kits being offered by Netafim. Today, there is a need to transfer the technology into the hands of the users. The farmers are demanding components of drip-kits like pipes, drippers etc which they can assemble on their own.

Moreover, there is a strong notion among the farmers as well as in the micro-irrigation industry that drip is a technology more suitable for big farmers. A buried strip drip system in the USA costs about US\$ 1,200 per acre (about the market value of an acre of irrigated land). *Pepsee* systems are low-cost alternatives of drip irrigation systems and are made up of low density polythene ranging from 65-130 microns, essentially used for making ice candy locally called '*Pepsee*'. The initial investment for *Pepsee* systems is 42 percent less than the same for micro-tubes and 78 percent less than the same for conventional drips. At an initial investment of less than US\$ 100, *Pepsee* systems offer the perfect 'Stepping Stone' for adoption of more sophisticated water saving technologies.

Figure 10



International Water Management Institute

IWMI is one of the 16 Future Harvest Centers supported by the Consultative Group on International Agricultural Research (CGIAR). The research program of IWMI centers around five core themes: Integrated Water Resource Management for Agriculture; Sustainable Smallholder Water & Land Management Systems; Sustainable Groundwater Management; Water, Health and Environment; and Water Resources institutions and Policy.

Sustainable Groundwater Management

The goal of IWMI's research in groundwater is to contribute to achieving sustainable use and management of groundwater in ways that promote food and livelihood security for the poor women and Men in Asia and Africa. Under IWMI's strategic plan 2000-2005, ongoing research under this theme has five priorities: [1] Assessment of the extent of groundwater use, its economic value and contribution to agrarian wealth creation; [2] Understanding Basin level impacts of local water harvesting and recharge; [3] Exploring linkages between groundwater irrigation and rural poverty; [4] Analyzing approaches to conjunctive use of surface and groundwater; and [5] Identifying practical approaches to sustainable groundwater management through comparative analysis of institutions and policies.

IWMI-Tata Water Policy Program

The IWMI-Tata Water Policy Program was launched in 2000 with the support of Sir Ratan Tata Trust, Mumbai. The program presents new perspectives and practical solutions derived from the wealth of research done in India on water resource management. Its objective is to help policy makers at the central, state and local levels address their water challenges in areas such as sustainable groundwater management, water scarcity, and rural poverty by translating research findings into practical policy recommendations.

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