



Groundwater irrigation in West Bengal (IWMI)

Tapping into groundwater policy

In eastern India, easing of a pump policy spurs production

In eastern India, farmers from the state of West Bengal need to grow crops during both the wet and dry seasons to earn a decent livelihood and sustain food supplies for a population that approaches 100 million.

However, water tanks and ponds are often dry by January, leaving scant surface water until the monsoon rains start six months later. Groundwater, thus, becomes a critical resource for dry-season farming.

Research by the International Water Management Institute, which leads WLE, had an instrumental impact on groundwater policy reform in West Bengal

in 2011, which, in turn, improved the livelihoods of tens of thousands of smallholder farmers, according to an evaluation conducted in 2013 and 2014. But the policy changes, which made it easier for smallholder farmers to buy electric irrigation pumps, now may need to be tweaked to avert potential groundwater depletion.

IWMI researchers examined the situation after agricultural growth in West Bengal had slumped from around 5 percent a year in the 1980s and 1990s to 2 percent annually in the 2000s.

Researchers referred to the data they had collected during several years of fieldwork under a Tata Foundation-funded program, and additionally examined farmer behavior and economics, and the costs and benefits of various groundwater management options.

They identified access to groundwater as a major obstacle to agricultural productivity. But there was some good news: Unlike some parts of India, ample, untapped groundwater resources existed.

The agricultural slump in West Bengal had stemmed in part from well-intentioned groundwater legislation of 2005 that had required farmers to apply for permits to use electric tube well pumps. The goal was to preserve groundwater sustainability and track the number of wells.

The unintended impact was that smallholder farmers were mostly priced out of the market because applying for an electric-pump permit was costly and time-consuming. Moreover, farmers had to pay for the full cost of wires, poles and transformers to connect their pumps to the grid. That was prohibitively expensive for poor farmers, and for farmers who lived at a distance from the grid. Smallholder farmers resorted to expensive diesel pumps, using them as much as their economic situation would allow.

As part of the Bill & Melinda Gates Foundation-funded AgWater Solutions project, IWMI recommended relaxing the electric pump licensing process, and introducing a flat electric connection fee. The policy recommendations were presented to the state water department in September 2011, and acted upon by state government officials within two months.

Two years later, IWMI scientist Marie-Charlotte Buisson evaluated the impact of the policy changes. Based on a survey of nearly 1,400 farmers and secondary data, an estimated 500,000 smallholder farmers had benefited from improved access to irrigation since the 2011 amendments.

The net cultivated area is higher by 21 percent for electric pump owners, according to the analysis. Perhaps most significantly, farmers using electric pumps reported earning 2,900 Indian rupees per acre (43USD) a year more than farmers not using electric pumps, mainly because of lower power costs, according to the study.

A state water department official, Subrata Biswas, lauded IWMI's research in 2012 as being "crucial in bringing the policy changes," and being more inclusive. "Existing permit holders had acquired a monopoly over groundwater, creating a sense of scarcity among farmers. However, water resources are best managed when all the local community is involved in decision making," he said.

But there were also some warning indicators in the evaluation. For example, the survey found that more water-intensive crops were chosen after the 2011 policy changes, while agricultural yields weren't significantly higher.

"Considered with the absence of impact on yields, this means that more water is extracted without producing necessarily more output," Buisson said. "In a context of declining groundwater storage in the region, this questions the sustainability of the electrification policies to manage the groundwater resource."

Buisson recommended additional hydro-economic analysis to determine the link between tube well electrification and the decline in water tables in some locations. WLE researchers are exploring possible policy modifications to ensure groundwater sustainability.

Meredith Giordano, WLE's flagship leader of Land and Water Productivity, said there are important lessons to be learned from the West Bengal experience and the commitment by policy makers and researchers to continue to monitor the impacts of the policy change.

"The experience in West Bengal highlights the importance of continually learning," Giordano said, "and assessing the changing circumstances to adapt research and actions accordingly."

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Electric pump that supplies groundwater to a farm in West Bengal (IWMI)

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