Source : www.livemint.com Date : 2018-10-31

OPINION

Relevant for: World & Indian Geography | Topic: Distribution of key natural resources - Water Resources incl. Rivers & related issues in world & India

India’s over-exploitation of groundwater is contributing to—as stated by NITI Aayog—“the worst water crisis in its history”.

Groundwater is one of the most important water sources in India accounting for 63% of all irrigation water and over 80% of the rural and urban domestic water supplies. In fact, the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Water Development Report states that India is the largest extractor of groundwater in the world. Fifty-four percent of India’s groundwater wells have declined over the past seven years, and 21 major cities are expected to run out of groundwater by 2020. Thus, India faces a dual challenge: to regulate the growing demand for groundwater while replenishing its sources.

Subsidies on electricity are thought to play a central role in the Indian groundwater crisis. The vast majority of groundwater pumps are unmetered, and if charged, are billed at a flat, non-volumetric, and highly subsidized tariff . This flat rate is responsible, at least in part, for inefficient usage and excessive withdrawal of groundwater.

In addition, the government encourages farmers to produce water-intensive crops like rice and sugarcane through increased minimum support prices (MSP).

Research indicates that although MSP has led to assured incomes, it has also led to groundwater depletion, income inequality and unsustainable agriculture. On the supply side, performance of state governments has not been satisfactory, with the NITI Aayog Composite Water Management Index (CWMI) report stating that the majority of states have scored less than 50% in the source augmentation of groundwater resource index .

Given this situation, we require policies that promote judicious use of groundwater. Although there are a number of potential interventions in the area of groundwater conservation, there are hardly any rigorous evaluations. In absence of rigorous research, such as randomized evaluations, which can establish the causal impact of an intervention, it is a challenge to identify solutions that are highly effective. However, researchers could draw lessons from existing solutions, and use them to design interventions that could later be rigorously evaluated.

One of the proposed ways to reduce groundwater extraction is by reducing electricity subsidies. An analysis of panel data across 370 districts in India found that a reduction in electricity subsidy was correlated with a decrease in groundwater extraction . On average, a 10% reduction in electricity subsidy generated a 6.7% decrease in groundwater extraction. However, reducing electricity subsidies for farmers could be politically unpopular.

One possible way to overcome this challenge is by limiting the electricity subsidy offered to farmers and compensating them with a direct cash transfer for every unit they save. This provides farmers an incentive to use groundwater judiciously without any additional cost to the government.

The government of Punjab has entered into a partnership with the Abdul Latif Jameel Poverty Action Lab (J-PAL) to conduct a randomized evaluation to test this model. Researchers will estimate the impact of this cash transfer intervention on farmers’ power use, with the ultimate goal being to reduce groundwater extraction.

Another way of efficiently using groundwater is by encouraging farmers to adopt micro-irrigation techniques such as drip irrigation and micro-sprinklers. According to the CWMI report, adopting micro-irrigation techniques can save roughly 20% of the groundwater used annually on irrigation in India. A key challenge is to convince farmers to adopt such techniques.

A study by Kumar and Palanisami showed that the adoption of drip irrigation increased in areas where less water-intensive crops such as banana, grapes and coconut were grown . Additionally, the study found that the adoption of drip irrigation was higher in regions where water and labour were scarcer. Thus, it would be prudent for policymakers and researchers to encourage adoption of drip irrigation practices and rigorously evaluate its impact on groundwater levels in such areas.

Lastly, creating sustainable change would require a bottom-up approach by empowering the local community to become active participants in managing groundwater. In line with this, the central government in its 12th five-year plan proposed a policy of participatory groundwater management (PGM), which involves a collaborative approach among government departments, researchers, NGOs and community members. The plan involves training community workers to carry out aquifer mapping and implement innovative ways to use groundwater conservatively with the local community.

The PGM has been implemented in different states, albeit with some variations, such as the Andhra Pradesh Farmer Managed Groundwater Systems (APFAMGS) programme in Andhra Pradesh and Pani Panchayats in Maharashtra .

However, there is almost no research study evaluating its impact. While this void is disconcerting, it also presents an opportunity for researchers and policymakers to design and test different interventions ranging from awareness campaigns to training programmes that effectively mobilize and equip the local community to work towards groundwater conservation.

Groundwater has helped India overcome food shortage in the 1960s by playing an instrumental role in ushering in the green revolution. However, the NITI Aayog CWMI report is a timely reminder of the need for policymakers and researchers to come together and conduct rigourous evaluations in order to understand what works and what doesn't work for groundwater conservation.

Unless we take urgent measures to avert this crisis, we may find ourselves faced with an environmental catastrophe of our own making.

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