

# India's looming water crisis and urgent measures to address it

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## **Sudipto Mundle**

- Water tables have fallen drastically and we need paradigmatic changes in agricultural practices for resource conservation
- Our policies to ensure food sufficiency and assure farmers income have unfortunately also caused crop distortions that have led to excessive drawing of groundwater and its depletion

A disastrous water crisis has been creeping up on us for years. Water tables have declined precipitously, even by thousands of feet in some parts of Punjab, Haryana and Andhra Pradesh. Tanks and wells have gone dry. Some rivers have shrunk while other smaller ones have completely dried up. Water rationing is routine in many urban areas, while in many villages women are trudging longer distances to fetch water.

In my March column on the entangled economics and politics of the farmers' agitation (*Mint*, 19 March 2021), I had explained that the Green Revolution, which made India self-sufficient in food, was also the origin of the policy distortions underlying the agitation. I also pointed out the terrible ecological consequences of the same policy distortions, in particular the depletion of ground water. I had suggested that, among other measures, the government should gradually shift from the near exclusive procurement of wheat and rice (95%) at assured minimum support prices (MSPs) to the procurement of other crops such as jowar, bajra, ragi and other nutri-cereals, and also pulses, oilseeds, etc. The announcement of MSPs for 23 major crops means little without significant quantities of these crops being procured at those prices.

This was suggested to help correct our long prevailing relative price distortions favouring wheat and rice in agricultural markets, and to incentivize a shift in cropping patterns towards nutri-cereals, pulses and oilseeds. Shah M. and P.S. Vijayshankar (S&V) have now explained in a recent paper why such cropping pattern shifts are also essential for addressing the country's water crisis ('Symbiosis of Water and Agricultural Transformation in India', 2020). They point

out that agriculture consumes about 90% of India's water supply, and of this, 80% is consumed by just three water-guzzling crops: rice, wheat and sugarcane.

India's gross cropped area has increased by over 120 million hectares since the 1980s, mainly due to an increase in ground water irrigation, especially through tubewells. In the past 40 years, about 84% of the increase in net irrigated area has come from ground water. At 250 billion cubic metres per year, India is the largest consumer of ground water in the world, consuming more than China and the US—the next two largest—combined. It is not surprising that our water tables have fallen so drastically.

But how can we address this looming water crisis? S&V have detailed the many paradigmatic changes required in agricultural practices and in the management of water. Here is a brief summary:

In addition to the cropping pattern shifts mentioned above, S&V propose a shift to water-saving seed varieties even in rice and wheat. They also propose the use of water-saving practices such as rice intensification, conservation, tillage, drip irrigation, land-levelling and direct seeding of rice. Field trials suggest that these practices can save between 17% (Rajasthan) to 80% (Tamil Nadu) of our blue water compared to conventional practices. In most states, the blue water saved is between 25% and 50%.

Second, groundwater use is completely unregulated, resulting in its catastrophic over-exploitation. The common law of absolute domain prevails, giving landowners the right to extract unlimited amounts of water with their tube-wells, ignoring the externality that the aquifers tapped by them may also be tapped by others' tube-wells. Competitive water extraction becomes a race to the bottom, accelerating the fall in water tables. Hence, legislation to regulate the use of ground water is most urgent. States can adapt the model Groundwater (Sustainable Management) Bill of 2017 to local conditions and pass their own legislation. This can be supported by rationing the availability of power to run pumps and restricting it to just a few hours a day. The alternative of licensing and metering the use of some 45 million wells and tubewells seems impractical at present.

Third, protective irrigation for conserving green water is another key measure, along with the protection and rejuvenation of catchment areas. S&V point out that there has been a decline in the annual run off in many major river basins, not

because of any decline in rainfall, but because of encroachment and other activities that have damaged catchment areas. China, Brazil, Mexico and other countries are considering paying local residents to protect catchment areas and keep river basins healthy and green. Similarly, the employment of local residents in India for micro-level watershed management schemes, suitably adapted to local conditions, could protect catchment areas and also generate large-scale employment.

All this points to the key role of farmers as agents of change. Whether it is agricultural practices to conserve blue water or local watershed management to preserve green water, or local cooperation for sustainable ground water use, farmers themselves will have to champion these initiatives. Governments have a crucial role in aggregating such local initiatives and scaling them up, but at the local level, participatory management by farmers is essential to ensure positive outcomes.

Top-down administrative arrangements will have to be replaced by participatory, bottom-up systems led by farmer producer organizations (FPOs) along the lines of the Kaira District Co-operative Milk Producers' Union. Women's self-help groups (SHGs), which have gone beyond collective credit to various agricultural activities in several states, are closely-related institutions. Governments need to support the development of these institutions but FPOs and SHGs will have to be the leading agents of change in this new paradigm.

*Sudipto Mundle is distinguished fellow, National Council of Applied Economic Research, New Delhi. These are the author's personal views.*