

Focus on sustainable water usage in Indian agriculture under climate change

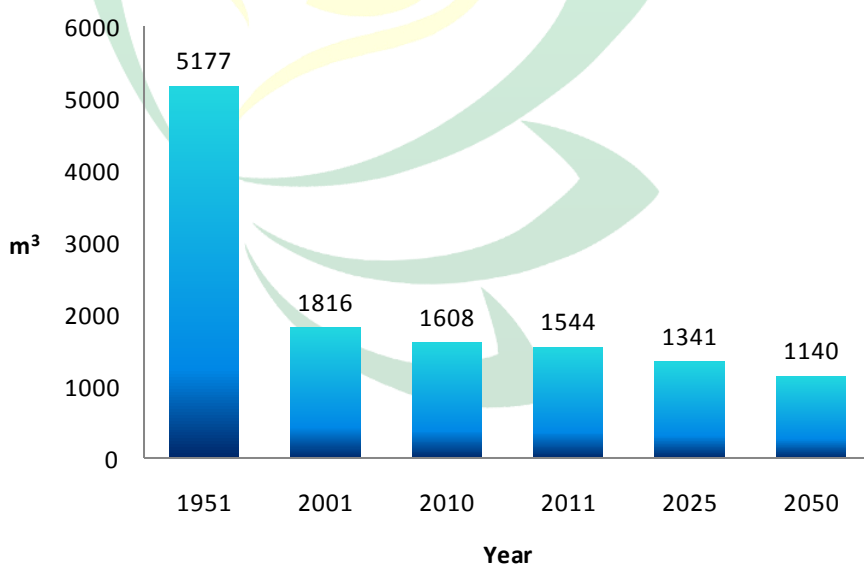
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Introduction

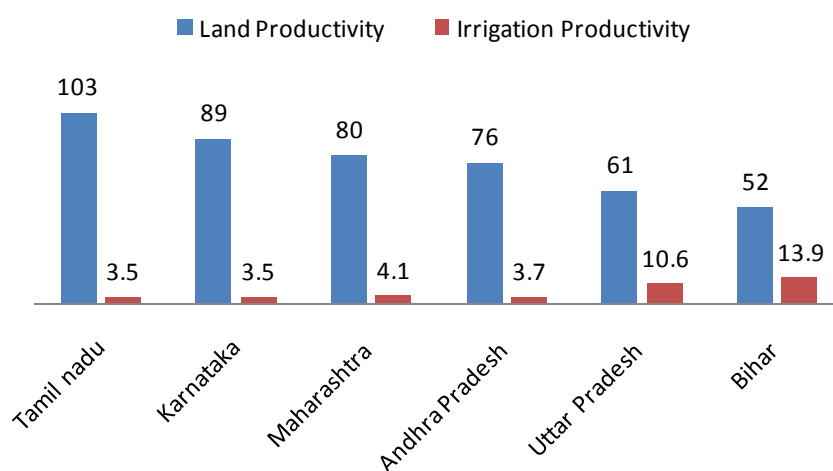
The Indian agriculture sector predominantly consists of small and marginal farmers (S&MF), which requires prioritization of development strategy to reduce poverty by sustainable agriculture and farmers' livelihood. The productivity is directly proportional to the agro-inputs, access to irrigation, cropping intensity, pattern, and technology. The key aspect of productivity is by improving resource use efficiency, particularly water. (One of the sources of income growth identified, by the Committee on Doubling Farmers Income). Owing to the current water stress faced by the country, with the per capita water availability reported, water is going to be the bigger binding constraint than land in India's agriculture development (Figure 1).



Graph 1: Annual per capita water availability in India (m³) [Source: CWC, 2013¹, 15²]

Increasing Irrigation Water Productivity (IWP)

According to the Asian Water Development Outlook, 2016, Indian irrigation is mainly dependent (upto 89%) on groundwater (GW) extracted; which is considered highly unsustainable, as there are shreds of evidence of the dropping GW table. India is perceived to be a potential global hotspot for water insecurity by 2050 where the water demanding agriculture sector remains to be the predominant occupation with regards to employment. Therefore, the framework with an appropriate mechanism is required for economical management of water among the S&MF. The incentive of minimum support price (MSP), Subsidized electricity, water, and other inputs have led to misalignment of cropping pattern in the country which skewed towards the section of water-intensive crops like sugarcane which requires 60% of irrigation water available in the country, thereby reducing the water availability for other crops



Graph 2: Comparison of Land Productivity and Irrigation Water Productivity across the Major Sugarcane Growing States [Source: ICRIER, 2018]

The evident divergence between land productivity and IWP in sugarcane production (Figure 2) indicates that the cultivation of a water guzzler crop like sugarcane stands out as a paradox in water-stressed India and reflects the surge to refocus on IWP to increase productivity. The States like Tamil Nadu, Karnataka, Maharashtra, and Andhra Pradesh that have high land productivity tend to have low IWP, showing inefficient use of water and the need to re-



calibrate the cropping pattern along with improved methods of irrigation and irrigation technologies. While adopting a Micro Irrigation System (MIS) is one of the possible ways to improve water use efficiency, the installation cost would be disincentive unless the government is providing subsidy to small and marginal farmers. To facilitate communication and reduce transaction costs, the ICT (Information and Communication Technology) applications are crucial in smallholder farming. The spread of mobile phones in rural areas has already influenced the way the small and, marginal farmers get access to information about soil, moisture, weather advisories for deciding the irrigation requirements, thus improving the water use efficiency. A combination of measures that suit the local agro-economic context need to look at improving irrigation productivity in agriculture that will reflect sustainable water use in agriculture. In this regard, the focus in agriculture should shift from 'land productivity' to 'irrigation water productivity'. Therefore, taking the cognizance of climate change, the political economy should devise policies to incentivise farmers to adopt sustainable irrigation methods in Indian agriculture.