

14-Water for Development in Bundelkhand:Challenges, Strategies and Way Forward (The World Bank's Views)

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Introduction

The Bundelkhand region in the southern part of UP is among the poorest regions in the state, characterized by low rainfall, drought prone conditions and marginal lands. While overall economic growth in Bundelkhand is on par with average state-wide growth, agricultural growth in Bundelkhand is lagging behind. Evidence suggests that districts that saw anemic agricultural growth rates also performed worst in reducing poverty. Districts that have an above-average proportion of the population in agriculture were worst affected¹. Investments in promoting agricultural growth and in particular in reducing the region's vulnerability to the devastating impacts of drought therefore carry a large premium on poverty reduction.

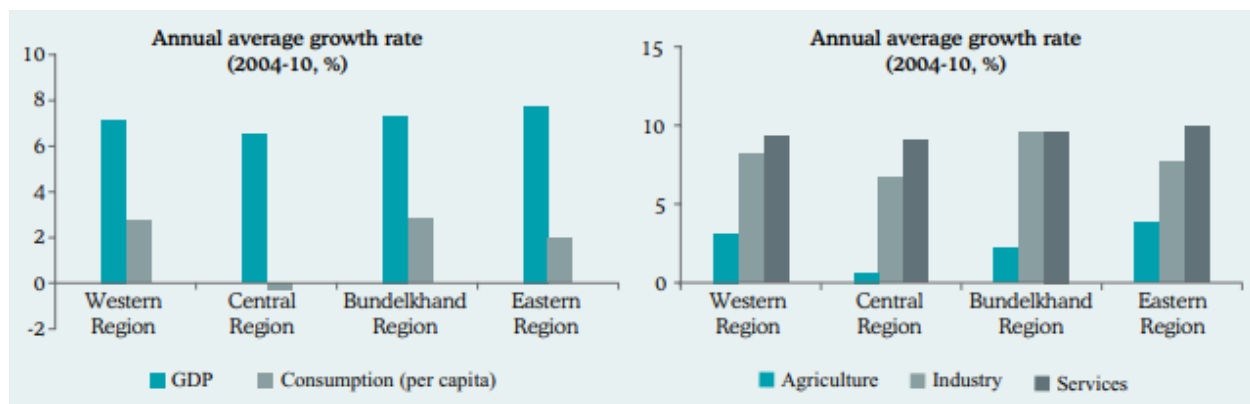


Fig 1: Annual Average Growth Rate (source: World Bank, 2016)

Severe droughts cycles have increased in frequency and have often led to reduced sown area, loss of productivity, failure of crops already grown, and non-availability of orange, grass and fodder. Moreover, droughts have decreased the filling of the available 2 BCM of storage capacity in the region, and the capacity of the region to respond to these droughts is increasingly being compromised. During droughts, groundwater tables decline and as many as 70% of tanks, ponds and dug-wells dry up. Out of a total cultivable area of 21,873 sq km, the sown area is 18,540 sq km (84.4%), out of which only 8,452 sq km (45.6%) is under irrigation. With the lowest irrigation intensity in the state, only rain-fed cropping during kharif season is possible, which further amplifies the region's vulnerability to droughts.

Despite extensive water scarcity, consumptive water use is high and water productivity in Bundelkhand was found to be the lowest among UP's districts², as low as half of that observed in the western parts of the state.

¹Uttar Pradesh Growth and Inclusion Report, World Bank (2016)

²Irrigation Water Management for Agricultural Development in Uttar Pradesh, India.SumanLata, 2019

Bundelkhand's soils are underlain by hard rock formations. Though the aquifers generally get saturated in the monsoon, the retention of water is short-lived, even without significant withdrawals, as the region is characterized by significant sub-surface outflow. Aquifers typically are depleted immediately after monsoon and water scarcity occurs during summer months. The highly heterogeneous hydrogeological conditions also result in the failure of a considerable number of bore wells.

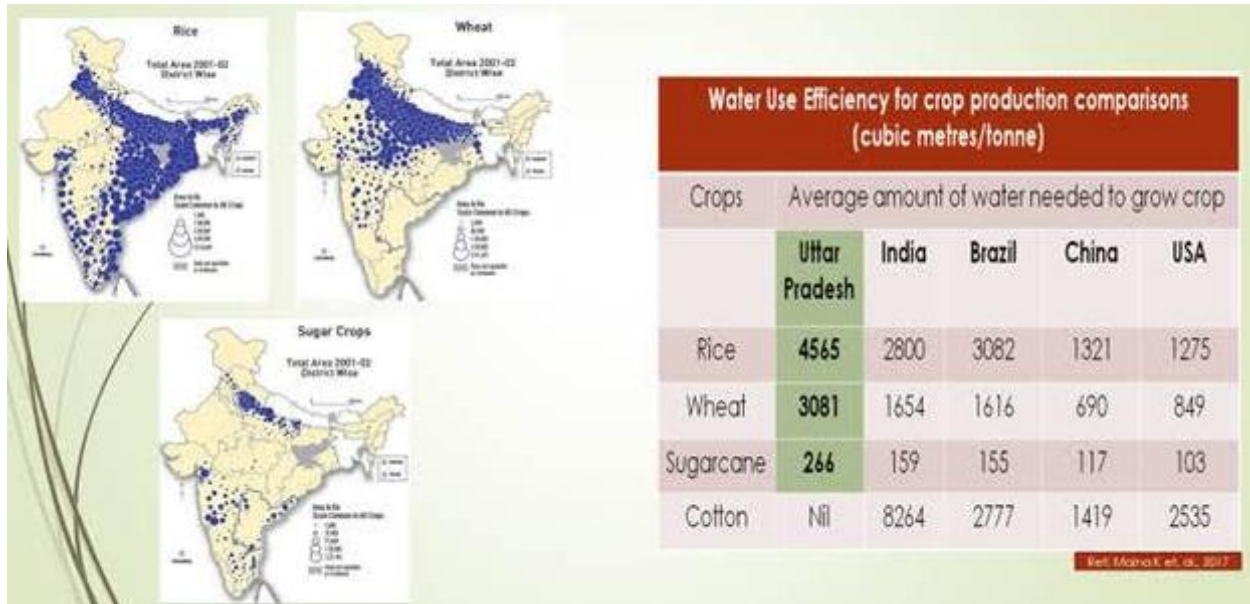


Fig. 2: Region-wise water consumption (source: Nabard, 2018)

Challenges and Opportunities

Bundelkhand's challenges as they relate to water are the low irrigation coverage, low water use efficiency and low water productivity, as a result of which the region is highly vulnerable to weather variability and climate change. Water availability is a constraint: surface water is only available in the kharif season and groundwater is unreliable because of the physical conditions of the hardrock that underlies much of the region.

Low irrigation coverage and low water productivity are related: with limited options for supply augmentation, expansion of the area irrigated can only happen by using the available water in Bundelkhand more efficiently. Efforts to address the water crisis in Bundelkhand through supply augmentation will have a limited impact; bold action is required to design smart demand management measures.

In addition, irrigation's contribution to poverty reduction is limited because of the low water productivity, i.e., much of the inefficiently used water irrigates lower value crops. Irrigated agriculture can make a more significant contribution to poverty reduction and economic growth if the region switches from lower value crops to higher value horticulture crops. Maina K. et al (2017) analyzes that, from a water productivity perspective, Bundelkhand has a comparative advantage compared to other regions in UP for the production of potatoes. This requires the

development of reliable market channels to get the more perishable horticulture crops to markets quickly, and it also requires a much higher quality of irrigation service delivery.

Water quality has emerged as an important impediment to the development of the region. Low water quality creates a health hazard and more water needs to be allocated for “Aviral Dhara” to create “Nirmal Dhara”.

A further challenge is the monitoring of weather and hydrological data and the use of these data for more reliable flood and drought forecasting. Significant investments in real-time monitoring are required to help the region respond to future weather-related calamities.

The World Bank’s Program in Bundelkhand

The World Bank is currently implementing a number of investment operations in Bundelkhand. These operations aim to improve the efficiency and productivity of water use in Bundelkhand, manage groundwater in a more sustainable manner, improve water quality and strengthen arrangements for data monitoring and evaluation for more reliable flood and drought forecasts.

The *UP Water Sector Restructuring Project– Phase II* aims to strengthen the institutional and policy framework for integrated water resources management for the entire State, and to increase agricultural and water productivity by supporting farmers in targeted irrigation areas. The total budget of the project is US\$515 million, including \$155 million from the UP government and \$360 million from the World Bank. To date, around 70% of project funds have been committed, and close to 60% has been disbursed. The project completion date is October 2020.

The project invests in the rehabilitation and modernization of Rohini, Jamiand Sajnam Dam canal systems in Lalitpur district for a total amount of Rs 179 crore. Civil works in Rohini are completed and overall physical progress is 69%. The investments in a flood management information system and flood forecasting tools for Rapti basin and drought mitigation impacts in Bundelkhand region is estimated to save an annual flood and drought damage cost of US\$3 million.

The project also provides support to the institutions responsible for overall water resources management and implementation of the State Water Policy, including strengthening the (a) independent water regulatory entity (WAMREC), (b) State Water Resources Agency (SWARA), (c) State Water Resources Data and Analysis Center (DAC), (d) primary training institute for Irrigation Department engineers, and (e) Water and Land Management Institute (WALMI). Finally, the project supports mobilization of communities, capacity strengthening and formation of WUAs.

The *National Hydrology Project (NHP)* supports regional development in Bundelkhand, among others by investing in real-time monitoring of reservoirs. Doing so will help in monitoring real time water availability in the region and in preparing for droughts. The project has also established real time groundwater monitoring to provide a better assessment of groundwater availability in the region. The online water resources information system (IndiaWRIS) that NHP is supporting is providing information about water budget parameters including rainfall, river flows and storage, thus increasing the reliability of drought forecasts.

The recently approved *National Ground Water Management Improvement Program (NGMIP)* aims to develop robust and resilient systems to ensure long-term sustainability of ground water resources, among others the districts of Mahoba, Jhansi, Lalitpur, Banda, Hamirpur and Chitrakoot. NGMIP has adopted a “Projects for Results” approach that uses India’s own institutions and processes, and links disbursement of funds directly to the achievement of specific program results in two result areas. Results Area 1: “Improved planning and implementation of groundwater management interventions” will focus on (a) introducing bottom-up planning of groundwater interventions through community-led Water Security Plans, (b) improving government spending through the planning process, and (c) implementing participatory groundwater management, including both supply- and demand-side measures. Results Area 2: “Strengthened institutional framework and effective groundwater data monitoring and disclosure” focuses on building institutional capacity at all levels, including improving groundwater information and making it publicly accessible. Activities will include building institutional capacity at the State, district and GP levels by ensuring that staff are adequately trained to effectively manage groundwater resources.

The *2030 Water Resources Group (2030WRG)* has helped address the Bundelkhand water crisis by helping the UP Government set up a Multi-Stakeholder Platform (MSP) in which key public sector, private sector, academic and civil society players convene to identify synergies and integrate efforts for sustainable water resources management and development. The MSP is chaired by Honorable Chief Secretary, GoUP with active participation from various line departments and other non-government stakeholders. Five Thematic Areas of Intervention identified:-

- Water Reservoir Rejuvenation
- Watershed Development
- Irrigation Practices
- Agriculture Practices
- Market Linkages

The MSP has been instrumental in increasing water storage in Jhansi and Chitrakoot districts, has introduced an integrated “drip-to-market” approach to micro drip irrigation, has prepared a Vision Document for Bundelkhand, has facilitated a Partnership with Israel, and will support the NGMIP by working with key stakeholders to develop Water Security Plans at the Gram Panchayat level.

Towards a Bundelkhand Irrigation Efficiency Campaign

In view of the above, this paper recommends taking bold action to address Bundelkhand’s water-related challenges head-on by launching a region-wide campaign to dramatically improve the efficiency and productivity of irrigation. Supply augmentation measures alone will not be adequate to have a significant impact on Bundelkhand’s water availability. What is required is concerted action to provide incentives for more efficient and more productive irrigation water use. The campaign would bring together in a comprehensive and coordinated manner a number of ongoing initiatives that are supported by the GOUP to amplify momentum and capture synergies for more decisive impact in terms of climate resilience, irrigation coverage and poverty reduction. The campaign would consist of the following pillars:-

1. **Micro-irrigation:** design and provide smart incentives for the adoption by farmers of efficient micro-irrigation technologies. In addition to existing central government and state subsidies through PMKSY, the campaign will engage with equipment suppliers, agricultural market players, banks and non-banking financial institutions to creative incentives for adoption. The program will also pilot the introduction of performance-based operation in selected reservoirs in Bundelkhand.
2. **Drip-to-market:** Roll out and scale up a comprehensive micro-irrigation-to-market approach that will connect farmers to markets and provide incentives to grow horticulture crops, improve the reliability and speed of marketing channels, increase farmers' and agricultural traders incomes and generate farm and non-farm employment.
3. **Water quality:** scale up investments and pilot innovations (e.g., use of block chain) in improving water quality.
4. **Monitoring and evaluation:** scale up investments in monitoring and analyzing weather and hydrological data to improve the reliability and lead time for extreme weather events. Improve the impact of the campaign by systematically monitoring its performance, including through the use of modern remote sensing.

The campaign will help the GOUP and the region of Bundelkhand leverage modern technologies, knowledge and incentives to reduce Bundelkhand's vulnerability to weather shocks, reduce poverty and generate employment. The campaign could provide a model for other states in India.

The World Bank is open for business and ready to support the campaign by bringing in global experience in the design and implementation of similar campaigns elsewhere.

List Of References

World Bank (2016): Uttar Pradesh Growth and Inclusion Report

Suman Lata (2019): Irrigation Water Management for Agricultural Development in Uttar Pradesh, India. Springer International Publishing.

Kumari, Maina, Singh, O., Meena, Dinesh (2018): Optimising Cropping Pattern in Eastern Uttar Pradesh Using Sen's Multi Objective Programming Approach. In: Agricultural Economics Research Review, 30(02), February 2018.

Amarnath Tripathi (2019): Doubling the Farmers' Income in Uttar Pradesh by 2022 - Opportunities & Constraints. Institute of Economic Growth, Delhi.