Restoring hopes through Landscapes: Reviving Nature, water and livelihoods

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Across the semi-arid landscapes of Bundelkhand in Central India, water scarcity has long dictated the terms of life, livelihoods, and land use. Yet, within this challenging terrain, the Tahruali cluster in Jhansi district, Uttar Pradesh, offers a transformative story of how science-led, community-driven action can revive degraded landscapes, restore water security, and reimagine the region's agrarian future. Before the intervention, the Tahruali cluster faced a stark reality. Across 40 villages covering nearly 28,000 hectares, more than 5,400 of the 6,104 wells (both dugwells and borewells) had dried up (**Figure 1**). Communities depended heavily on erratic monsoons and dwindling groundwater, leaving farms vulnerable and livelihoods uncertain. Recognizing the urgency, ICRISAT and partners, with the support from Government of Uttar Pradesh, initiated a comprehensive landscape resource conservation program that combined traditional wisdom with modern science. The goal was simple yet ambitious: reclaim the landscape for sustainable water futures.

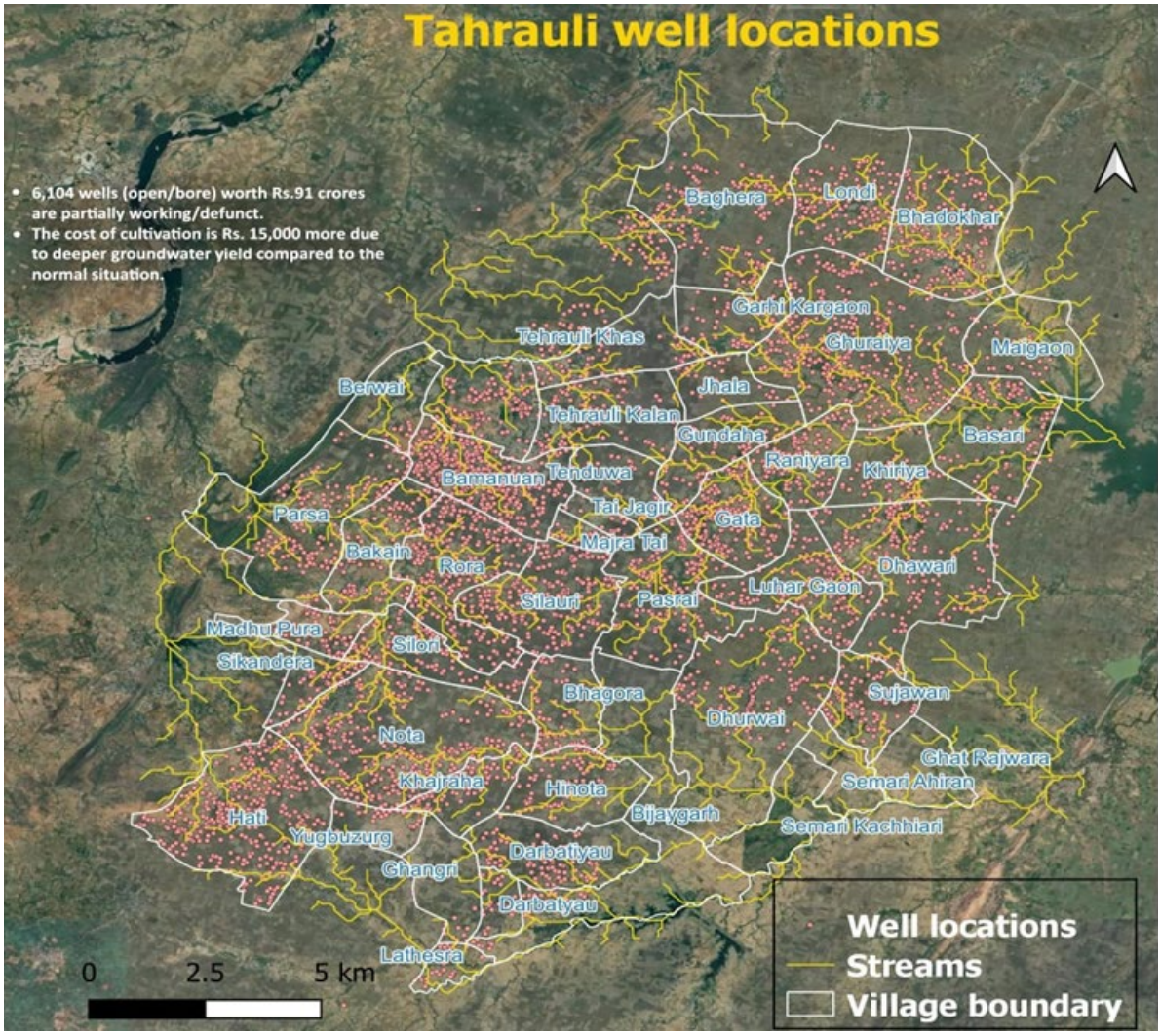

Figure 1: Private irrigation wells (dugwells and borewells) in Tahruali cluster, Jhansi district, Uttar Pradesh, India

Reviving the landscape through science led innovations and farmers' participation

At the heart of this revival, lay the rejuvenation of *Havelis*-traditional rainwater harvesting systems intrinsic to Bundelkhand's hydrology. Historically, these structures captured monsoon runoff, recharging groundwater and supporting agriculture during dry months. Over time, however, neglect and structural decay rendered them ineffective.

ICRISAT introduced an innovative masonry core-wall design to strengthen the *Havelis*' structural integrity. Unlike conventional earthen embankments, the masonry core-wall, built on a strong foundation and of optimal height, ensures full submergence capacity and long-term stability. These rejuvenated *Havelis*, strategically located at the uppermost topo-sequence of the landscape, now serve as anchor points for water conservation. Collectively, they have created a storage capacity of 5.49 million cubic meters (MCM), with the potential to harvest 16.5 MCM of rainwater each season, transforming water availability across the cluster.

Water that brought life back

The visible impact has been profound. Once-abandoned wells are now thriving again: around 5,000 wells have been rejuvenated with improved water quality, restoring agricultural and domestic water supply. This revival represents an infrastructure value equivalent to ₹162 crore (USD 19.5 million), a powerful demonstration of nature-based economic returns. In parallel, the deepening and widening of existing stream networks helped regulate surface runoff, enhance groundwater recharge, and reduce erosion. These measures have not only stabilized the local hydrology but also minimized siltation downstream, ensuring a more resilient, productive, and balanced ecosystem.

Equally transformative has been the improvement in domestic water availability. Before the interventions, households in many villages depended entirely on water tankers supplied by the panchayats during the dry months. On average, at least four tankers a day, each costing about ₹500, were required for nearly four months every year (from April to July) to meet basic household needs. This recurring expense placed a heavy burden on the community and local administration alike. With the rejuvenation of the landscape and revival of groundwater sources, most households now access water from their own wells or nearby community sources even during summer. The end of tanker dependency has not only reduced financial stress but also brought dignity, security, and convenience to rural life, ensuring that women and children no longer have to spend hours fetching water under harsh conditions.

Beyond water: building agrarian resilience

Restoring water was only part of the transformation. To diversify income sources and enhance resilience to climate risks, different agroforestry models were established across the cluster. These systems combine trees, crops, and soil conservation measures to create multi-tiered production systems that generate ecological and economic returns over time. Species selection, tailored to soil type, rainfall pattern, and farmer preference, ensures that each model not only improves biodiversity but also strengthens livelihoods. Farmers are now hoping additional income from fruit, fodder, and timber while maintaining soil fertility and reducing carbon footprints.

Empowering communities through institutions

Sustainable water futures depend on empowered communities. Recognizing this, ICRISAT facilitated the formation of the Progressive Bundelkhand Farmer Producer Company Ltd., established in January 2024 in Tahruali tehsil. This FPO, registered under the Companies Act of 2013, aims to strengthen collective action, market access, and sustainable agricultural practices. Within a short time, it has become a hub of farmer collaboration, promoting high-quality production, efficient resource use, and shared prosperity.

A blueprint for the future

The Tahruali model offers a replicable blueprint for landscape-scale water resilience in semi-arid regions globally. It demonstrates that combining traditional hydrological systems, modern engineering, and community stewardship can yield powerful outcomes: recharged aquifers, climate-resilient agriculture, and strengthened rural economies. By reclaiming its landscapes, Tahruali is not just reviving water but it is restoring hope, dignity, and sustainability to the lives that depend on it.

The Tahruali story underscores a universal truth: sustainable water futures begin with landscapes that work with nature, not against it. As climate challenges intensify, the lessons from Bundelkhand, rooted in community, science, and resilience, offer a guiding light for regions worldwide striving to secure water, livelihoods, and ecological harmony for generations to come.