The Good Sight

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Champions of Change

A smile as bright as her future

Photo by Muhammad Ali Zaidi

Restoring tanks has resulted in increased water availability for irrigation.

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Self-Reliant Initiatives through Joint Action

From drought to prosperity

How a 2019-launched initiative is uplifting the lives of Bundelkhand's rural communities by restoring historical tanks and augmenting agrarian livelihoods

After being associated with SRIJAN, Lakshmi Kushwaha has encouraged many women to adopt organic agriculture.

Bundelkhand Initiative for Water, Agriculture, and Livelihoods (BIWAL) is an attempt to revive the Bundelkhand region's traditional water bodies and the surrounding ecosystem. The region is hilly and undulating and comprises 14 contiguous districts in the Southern belt of Uttar Pradesh and the Northern area of Madhya Pradesh states. Bundelkhand has historically been a water-scarce region as it is bereft of significant river systems, and the adverse geological conditions lead to suboptimal recharge.

The fact was known by the ancient communities living in the region that had built an estimated 8000 traditional water bodies between the 8th to the 12th century, funded by the then reigning Chandela and Bundela kings. However, most of these tanks were disused due to the siltation of beds, encroachment in the catchments, and illegal occupation of the tank beds. Coupled with this, the heavy dependence on groundwater resources such as tubewells has further deteriorated the water condition of the region.

BIWAL: Facts & Figures

- It is a joint undertaking by six civil action organizations led by SRIJAN and the communities to collectively revive the water harvesting culture of the region. This consortium is led by SRIJAN and intends to work on rural Bundelkhand's holistic and comprehensive social and economic development.

- Since the program's launch in 2019, it has positively impacted the lives of 24,309 farmers in more than 310 villages.

- It is through the restoration of 222 historic tanks, excavation of 1072 Dohas (Water harvesting structures), setting up of 173 Prakritik Krishi Kendras (bioresource centers), establishing of 470 multi-layer farms, and nurturing 17 Tapovans (mini-forests).

Restoration of a tank underway.

Water Management: A Brief History

In ancient and medieval India, water management was undertaken by the local community themselves; the kingdoms were responsible for providing monetary support. The site selection, planning, construction, distribution, and maintenance of the rainwater harvesting structures were all community-led and managed. India had a wealth of different water harvesting structures and techniques suited to the local geographical and geological contexts. The ancients knew the importance of harvesting rainwater received on the 120-odd rainy days so that it could be used year-long to meet the consumptive and livelihood requirements. Grand water harvesting structures were built across the country and funded by different kingdoms. The culture of building tanks was widespread in the Bundelkhand region, which Chandela and Bundela Kings ruled. 8000 Chandela and Bundela Tanks were built between 800 to 1200 AD.

Similarly, Keres was built in Karnataka, Eri tanks in Tamil Nadu, and Chevuru tanks in Andhra Pradesh and Orissa. Three states of South India, namely Tamil Nadu, Andhra Pradesh, and Karnataka, have more than 1,43,000 traditional tanks. Bihar had the famous Ahar Pynes to store water, and Gond Kings funded huge Katas, three-sided reservoirs, in Gondwana comprising Madhya Pradesh, Maharashtra, Orissa, and Andhra Pradesh.

This wisdom was lost as the control over water resources shifted to the state, beginning with colonial times. The gradual erosion of local control over resources marked the era of rule by the Britishers. The policies of Independent India also favored state control over water resources with the government's fascination with building huge reservoirs across rivers.

It led to the disrepair of most water harvesting structures and the decay of local community management systems. The shift of water control from the community to the government also had many other unwelcome repercussions, such as the low-cost recovery of canal systems, high cost of water supply, lack of source sustainability, lack of financial sustainability of water schemes, abysmal repair and maintenance and reduced supply resulting from poor management. Tank management systems were also disused due to the erosion of traditional community ownership structures. Since the community no longer controls the resource, they do not feel liable to manage tanks. Some reasons for the decline in tank irrigation are siltation of the tank bed, siltation of the feed channels, encroachments in the tank bed and catchment area, and development of good irrigation in the command area of tanks (Gomathinayagam et al., 2005).

While tanks were an important source of irrigation during the pre-independence era, in the 1970s area under tank irrigation was less than 3% (MOSPI, 2017). By the 1970s, due to the government subsidies on pump sets and due to dysfunctional surface irrigation structures, the community started moving towards groundwater-based irrigation systems. Today, India ranks at the topmost position in terms of groundwater usage, with 90% of the groundwater being used for irrigation as against 40% (the global average) (Suhag, 2016).

Understanding Bundelkhand

The Bundelkhand region straddles 13 contiguous districts; 7 are located in Southern Uttar Pradesh and the other 6 in Northern Madhya Pradesh. The region has a recorded history of droughts and water scarcity. It is due to the absence of any river systems, adverse geological conditions leading to suboptimal recharge, and recently the over-extraction of groundwater resources. It has led to high inter-generational incidences of poverty.

Many water harvesting structures, namely the Chandela and Bundela tanks, were built several centuries ago to provide water in times of scarcity and in years of normal rainfall for irrigation utility during the non-monsoon

months. These tanks served as a lifeline for the people for hundreds of years and were managed by communities before the British invasion. However, with the responsibility of maintenance shifted to the government, these structures fell into disrepair. Over the years the region has faced the brunt of droughts and water scarcity again due to deforestation, the diversion of catchment areas for other purposes, underscoring their continued relevance, and increased dependence on groundwater.

Bundelkhand is an agro-climatically and socio-culturally distinct region. It has languished behind other regions, even within these states, which by themselves rank low amongst India's economic development states. Geographically it straddles the Vindhyan plateau (overwhelmingly in Madhya Pradesh) and the Gangetic plains (mostly in Uttar Pradesh but also in Madhya Pradesh). Beset with light soils with poor moisture retention capacity, agriculture here has suffered from the vagaries of monsoons over the ages. Primary cultivators comprise 47.5% of the population, while 38.9% are laborers with a predomination of agriculture laborers. 40% of the farmers in the region are marginal farmers, 25.5% are small farmers, and only 5.4% are large farmers. Rainfed single-annual cropping systems sustain most of the population, barring a few tracks that have received the benefits of canal irrigation. With erratic rainfall, the agricultural lands in the vicinity of the small streams are left with a limited water source for irrigation. These shallow streams often run dry 2-3 months post-monsoon without any scope of recharge, which takes its toll on the rabi crop.

Access to drinking water is a significant issue in the region, and communities, especially women, bear this brunt. During the summer, they travel around 1.5km or more to fetch water for domestic needs. In villages barely a few kilometers away, people haven't had the time and "luxury" to worry about the Covid-19 pandemic. These villages have a much bigger crisis — water scarcity, which has peaked along with the summer, like every year. For nearly two dozen villages in this Bundelkhand region, water scarcity is common at most times of the year and reaches its peak in the summer months of April to June. Most hand pumps in the region have stopped running water, and wells have dried up.

Two types of tanks were historically built in the region. The first category of tanks was built by impounding the surface flow of rainwater in natural streams by constructing bunds across an undulating topography to store water for household purposes and cattle. The second category of tanks was more significant and, in addition to providing water for consumptive purposes, also provided irrigation to farms downstream of the bunds. Despite lack of maintenance and all-around apathy, most of the historic Chandela and Budela tanks still continue to serve the vital purpose of harvesting water for use by the people although on a much-reduced scale. They continue to have great relevance for the local communities. These tanks are in urgent need of repair and restoration. A historical

legacy and many rural community assets will be preserved if this is achieved.

The hypothesis for the BIWAL program to uplift the rural economy through work on tank restoration is as follows:

Drought-proofing and assured water for agriculture and allied activities can impede economic growth and social empowerment. A historical legacy in water harvesting would have been restored for use well into the future. It would have contributed to the climate-proofing of landscapes in a region where lack or shortfalls in the availability of water has adversely impacted the economic well-being of the people. Building a pool of local cadres on soil and water conservation and climate-smart agriculture.

The repair and rejuvenation of the tanking economy were seen as an opportunity to pave the way toward community-led management of the natural capital endowed upon them. Hence, the additional impetus was given to promote sustainable agriculture practices to expand avenues of on and off-farm employment. The implementation plan of the region-wide venture of BIWAL thus rested on two major focus areas; help expand and deepen livelihood opportunities with backward integration and forward linkages to strengthen the local agroecology.

A Chandeli water body.

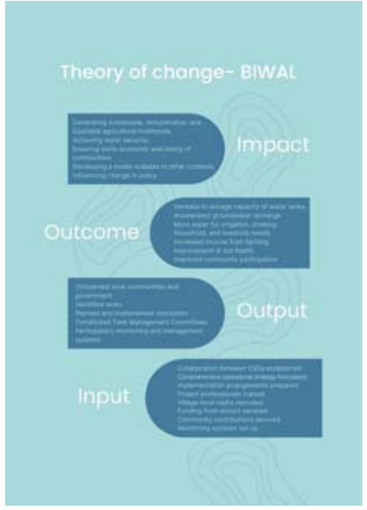
The BIWAL initiative was a daunting undertaking due to the large number of tanks spread across several districts, and many attempts had been made in the past to revive tanks on a large scale across the country. But these efforts mainly focussed on repairing physical structures and not on institutional mechanisms to maintain the tank infrastructure. Therefore, it is important to map the socio-economic dynamics around tank infrastructure before initiating any physical works.

In this context, BIWAL, a consortium of CSOs led by SRIJAN with vast experience in work at the grassroots, focussed heavily on fostering relationships with local institutions to ensure the long-term sustainability of the rehabilitation work. As a result, tank Management Committees (TMCs) were formed at every site to mobilize the local community and ensure the village's active participation in the revival and desiltation operations of the tank. These TMCs also worked in close coordination with the Gram Sabha and Panchayati Raj Institutions, which have been vested with the constitutional status as the supreme authority at the village level. This led to participatory decision-making and the long-term sustainability of the tank systems.

Strengthening the Tank Management Committees (TMC) is an important strategy to empower the user communities with decision-making responsibilities. It was done by providing access to ready-to-use information on available water and its sparing use, appropriate water budgeting skills, creating an enabling environment, and devolving financial management responsibilities.

The BIWAL worked on more extensive and more comprehensive socio-economic development of the region. Starting with the desilting of ponds and their repair, the initiative worked on building-related water harvesting structures and Climate-smart livelihood practices to optimize production and reduce costs to restore the agroecology of the region. The primary activities undertaken were tank restoration, silt application on farms, institutionalization and capacity building of Tank Management Committees (TMCs), excavation of other water recharge/ harvesting structures such as Dohas and gabions, promotion of climate-smart agricultural practices through training and support, the establishment of Prakritik Krishi Kendra (resource center for natural farming), facilitation of women producer groups, promotion of high-density agricultural production systems such as multi-layer farms, nano orchards, kitchen gardens and creation of micro forests known as Tapovans inspired by the Miyawaki technique.

In the last three years, a lot of ground has been covered to restore the tank ecosystem and strengthen local livelihoods by promoting innovative climate-resilient practices. A brief description of the various activities undertaken under the BIWAL initiative is below:



Tank Restoration
The first step of the restoration of the tank is its selection. It is a demand-driven process in that the community around the tank has to be interested in repairing the structure and willing to take up the tank management and maintenance responsibilities post-rehabilitation. Also, priority is given to multi-purpose tanks and structures that are relatively free of encroachments, and there are fewer conflicts within the community regarding tank repair and usage. The tank selection is formalized in the form of a Memorandum of Agreement with the Gram Panchayat.

Tank Management Committee (TMC)
A Tank Management Committee (TMC) is constituted at a general meeting with the village community to ensure active community participation from the beginning of the work. Efforts are made to ensure the representation of all habitations/communities in the village. The various terms kept in mind while forming the TMC are; 50% of members must be women. The TMC Charter states that "either the Treasurer or Secretary should preferably be a literate woman who can read and write." Regular meetings and discussions are held with the TMC to identify problems and issues in the Tank infrastructure.

Detailed problem analysis is conducted, and based on its findings, an action plan is prepared that includes a comprehensive list of interventions to be carried out to rehabilitate the tank.

Desilitation
Desilitation is often one of the most crucial operations. The program arranges for the excavators for desiltation, while the responsibility of transferring the silt from the tank site to agricultural fields is the community's responsibility. Tank Management Committees (TMCs) play an important role in the management of silt removal. The TMC leads the activities such as hiring tractors for silt transportation, deciding upon timings and shifts of silt removal, collecting names of farmers interested in silt application on their farms, developing norms to ensure equity in silt distribution, and conflict resolution, among others.

TMCs are the anchors of the project in the villages, responsible for the overall management of revival efforts, including water use planning and governance and the redressal of disputes among local stakeholders. Therefore, the capacity building of TMC is crucial for the rehabilitation operations' success. Training is provided to community members and TMCs on tank maintenance, water-use planning, water management, well water monitoring, improved farming practices, and horticulture as well as maintaining records and conducting meetings. A hands-on approach is used for training and capacity building wherein the implementation of tasks is assigned to TMC members, and CSOs provide handholding support.

Since the project's initiation, 224 historical tanks have been desilted by the excavation of over 12.23 lakh cubic meters of silt that 6468 farmers have used. In tank restoration work the project contribution range from 28-32%, and community contribution range from 68-72%.

While addressing the issue of water, based on SRIJAN's field experiences and interaction with farmers, it was observed that climate change affects land and crop productivity in the region. There are instances of crop failure because of erratic rainfall, poor crop management practices, knowledge gap among farmers, poor soil health, and poor-quality seed availability. Thus, to address the adversity of climate change and build the capacity of the local community towards climate resilience agriculture, SRIJAN started with climate-smart agricultural practices.

Impact

Direct Outcomes of Restoration
After the restoration, a considerable and immediate increase in the storage capacity from the tanks was desilted and repaired. It implies that the tanks can harvest more rainwater and runoff and have improved soil water retention capacity, which has accelerated the recharge of shallow wells downstream of the tank within a radius of around 500-1000 meters. As per the study of 148 respondents from 9 villages in the Niwari district of Madhya Pradesh, a noticeable increase in groundwater levels has been observed. They also reported that the increased availability of water has reduced the drudgery of women as they do not need to make arduous treks to fetch water anymore. Women spent 2.5 hours on average previously fetching water.

Additional income-earning opportunities have also been created due to more water in tanks. People of some villages have started community fishing in the tanks. Some villages harvested and sold indigenous fish species Rohu, Catla, and Common carp after tank restoration. Some revived tanks have also been used to cultivate water chestnut (singhara), and lotus seed (makhana) both of which claim premium rates in the market.

Benefits to Agriculture
Restoring the tanks has resulted in increased water availability for irrigation. Applying the fertile silt from tank desiltation has improved the soil profile of the beneficiary farmers. The surveyed farmers reported growing mungfali (groundnuts), urad, mung, til (sesame), soybean, ginger, and safed muesli in the Kharif and wheat, mustard, peas, black gram, barley, and potatoes during Rabi, with wheat being the primary crop. The black silt from the tanks has improved the soil nutrient content and water retention, leading to improved crop yields, better quality of crops, and reduced the water requirement of most crops. Farmers reported that wheat needed only 3-5 rounds compared to the 7-8 rounds required earlier.

94% of the study's respondents reported improvement in crop productivity, and 93% reported improvement in soil health. In some villages, the farmers mentioned that their chemical fertilizer requirement had reduced post-silt application. The yield of wheat reported the most significant jump in productivity. Farmers reported a doubling of wheat yield; in the case of other crops, an improvement of as much as 20 quintals per hectare was reported.

The increase in water availability post-restoration has led most prominently to an increase in the cultivated area in Kharif and Rabi seasons. The total cultivated area increased by 16.4% in Kharif and 17.4% in the Rabi season. The area under irrigation for both cropping seasons increased considerably—28% in Kharif and 33% in Rabi in the tank command. Most farmers reported an increase in both the water level and its duration in the wells. Earlier, most wells of the area would dry up by February or March but post the tank revival, the wells retained water till May. A significant increase in pumping duration has also been reported. Farmers reported that while the motor would pump for 0.5 hours earlier, after the tank restoration, the water motor could pump for 1.5-2.5 hours per day.

Towards Gender Equity
Along with tangible benefits in agriculture and livelihoods, the initiative has led to changing gender dynamics, with women taking the lead to drive change in their homes and societies. Women in Bundelkhand faced stringent restrictions with most not allowed to step outside their doors. All of that is slowly changing, with women renegotiating their space and voice within communities and their own households. Initially, the program faced many challenges in integrating women as the women were reluctant to share a platform with men, and even if they attended, most often, participation in the discussion was minimal. It took many meetings and countless hours of their silent presence before women began to participate in meetings. Today women not only attend meetings but bring others as well. Several women reported improved confidence and self-esteem after their association with the BIWAL initiative.

Kesar's learning journey with SRIJAN

Kesar dreams of attaining higher education and using her skills to improve her life. Interestingly, her association with SRIJAN led to the advancement of her knowledge and brought her village's development

Kesar Kushwaha lives in Kachiyakhera, a small village in the Niwari district of Madhya Pradesh. Married at the tender age of 15, Kesar was a class 10 student when she had to leave her house and education for a life of struggle. She had been a good student and was keen to continue learning, but her lack of money was a significant constraint. Finally, her father came forward to support her higher education by providing his hard-earned wages towards her tuition fees and books. Through his support, she was able to complete her graduation. However, the lack of skilled employment avenues in her village meant she had to turn to agriculture.

The agricultural land owned by the family was meager, and they had cultivated crops on leased land to make some income. However, in recent years, their income from agricultural operations fell dramatically due to a sharp rise in input costs and market uncertainty. In that case, Kesar started offering private tuition to children from her village.

It was during this time that Kesar first got introduced to SRIJAN. The organization had chosen Kesar's village under the BIWAL project and had initiated working with farmers on organic agriculture practices. Kesar got interested in the concept and regularly attended meetings. She adopted organic agriculture on her farm and was convinced of its utility. She encouraged many other village women to practice organic agriculture by offering free samples of organic fertilizers and biopesticides. Seeing her active participation in the work, Kesar was nominated as a village resource person for SRIJAN.

While organic inputs had reduced the cost, the uncertainty of good harvests was a significant issue. Acute water scarcity had become a daunting reality for the village. Women of the village had to travel 4-5 km daily to ensure drinking water for their household.

SRIJAN organized a village-level meeting in which the desilting of a Chandeli talaab, an old tank in the village, was discussed. The desilting of the ancient tank would not only ensure water security for drinking and consumptive purposes and allow access to irrigation for most village households. Kesar played an active role in the tank desiltation work. She was responsible for maintaining the site record book, arrangement of tractors, and regular measurements. The potential was created with her effort totalling 31.68 lakh liters of water. Total JCB hours were 135.2 hours, and the number of silts carted away was 2120. The project cost was 1.57 lakhs, and the community contribution was 6.41 lakhs.

During the desiltation work, Kesar encouraged families to apply silt excavated from the talaab site on their farms. She was amongst the first few community members who experienced bumper yields after silt application. A total of 48 farmers have applied silt in more than 20 ha.

A Tank Management Committee has been formed to manage the operations and maintenance of the taalab. As the village resource person, Kesar plays a pivotal role in regularizing meetings of the TMC twice a month. In addition, she has undergone thematic training on water conservation, multi-layer farming, orchards, and agricultural practices.

She went for an exposure visit to see the successful models in other districts and states, which has helped her widen her knowledge and skills to apply in the field. SRIJAN also helped Kesar to set up a Prakritik Krishi Kendra in her house. She was given the training to prepare various organic manures, biopesticides, and bio-stimulants such as Jeevamrut, Ghan Jeevamrut, Soya tonic, Neemastra, etc.

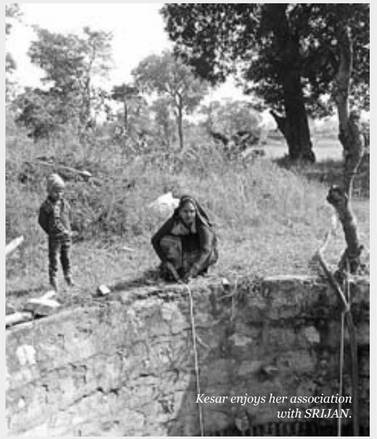
Regular meetings of women farmers of her village are held at this Kendra, where she encourages them to adopt organic agriculture and other innovative practices. She maintains a small demonstration plot on her farm that has been set up for farmers to try out new agricultural techniques and learn through experimentation. She has provided farmers with good quality seeds for Kharif and rabi crops. Presently, she supports 120 farmers in adopting better crop management practices in crops, resulting in a reduction in the cost of cultivation.

Apart from this, she was actively involved in the plantation of 250 saplings, 3 multi-layer farming, two nano-orchards, setting up 25 kitchen gardens, and providing 20 families with cookstoves and spray machines to women.

She regularly records the water level in the wells within 1 km radius of the Chandeli taalab. Furthermore, with the support of the technical team, she is conducting crop water budgeting with farmers and TMC members for better crop planning. Because of her strenuous efforts, there is acceptance among farmers towards new farming techniques and practices and making collective efforts towards achieving water sustainability for the village.

On her experience working with SRIJAN, Kesar shares, "I am learning a lot while working with SRIJAN. With the help of other women in the village, I am able to contribute towards the development of the village. I wish to continue this learning journey."

Kesar's wish to educate herself and learn has been realized, and it is not just benefitting her but also leading to the advancement of the village and its women.



Kesar enjoys her association with SRIJAN.

Kesar has helped setting up 25 kitchen gardens.