STORIES FROM THE FIELD

Bundelkhand Initiative for Water, Agriculture and Livelihoods

BIWAL

BIWAL is an initiative launched in 2018 to revive Bundelkhand to its ancient glory, by reviving the traditional water bodies (Chandela and Bundela tanks) and to work on issues relating to water, agriculture and livelihoods through community engagement. It is a consortium of 6 implementing organizations namely SRIJAN (Self-Reliant Initiatives through Joint Action), CARD (Centre for Agriculture and Rural Development), HARITIKA Arunoday Sansthan, Akhil Bharatiya Samaj Sewa Sansthan (ABSSS), and Yuva Kaushal Vikas Mandal. (YKVM).

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GROWING FOOD ON FIVE FLOORS

Multi-layer farming allows Seema to grow five crops at once on 200 sq. mt. of land, providing her with a steady cash flow all-year round, along with ensuring nutritional security for her household.

Seema Ghosh, a mother of five children is the resident of Dor vilage in Jatara block of Tikamgarh district, Madhya Pradesh. She along with her husband practiced subsistence agriculture on 2.5 acres of land owned by the family, which provided the family with enough food on their plates for 3-4 months, post which they supported their household by working as farm labourers in nearby villages.

Seema had attended a farmer's training organised by Self-Reliant Initiatives for Joint Action (SRIJAN), two years back on multi-layer farming. It is a method of cultivating compatible plants of different heights on the same plot of land by sowing at varying depths of soil at the same time.

The fear of losing out on labour income kept her from experimenting with multi-layer farming. Last year changed this way of life for Seema. COVID-19 and the subsequent lockdowns, have had an impact on almost everyone's life in some way or other. Seema's family was affected adversely. Unable to find farm labour due to stringent lockdowns, Seema and her husband were struggling to make ends meet. The family was faced with food security issues as their cash reserves were almost depleted. It is during this time, that Seema thought of putting the knowledge, she had gained almost a year back, to test. She decided to set up a multi-tier farm on 200 sq. mt. of her land.

SRIJAN had initiated multi-tier farming at a small-scale in 2019, to establish the model, as a steady source of cash income for small and marginal farmers, who face frequent liquidity crunch. The initiative, assumed importance in 2020, as a measure to combat COVID19-induced food and nutritional insecurity being faced by a large number of small and marginal farmers during lockdowns.

SRIJAN supported Seema by providing bamboo poles and wire for setting up the trellis, and also provided the seeds of vegetables and fruit crops to be planted on the miniature farm. She and her husband began work by setting up the bamboo trellis in May 2020. She received further trainings and knowledge transmission regarding crop combinations, bed preparation, farm-layout, strategic sowing, seasonal calendar, and manure and bio-pesticide preparation techniques.

She started sowing vegetables in the month of June, just as the rains arrived. She started by sowing the first layer; the tubers, which grow underneath the surface of the soil. She planted ginger and turmeric at a depth of two inches and covered it with mud. Next, she planted leafy vegetables, spinach and coriander as the second layer. Tomatoes were sowed as the third layer, while creeper vegetables of the gourd family formed the fourth layer. Papaya formed the fifth layer of this multi-story cropping field.

As ginger and turmeric are late germinating, by the time they sprouted, she harvested spinach and coriander in August-September.

Post this creeper vegetables started fruiting, which she harvested beginning September. At the same time tomatoes also started bearing fruit. The tubers, ginger and turmeric matured next and were harvested during February this year. The papaya fruits can be harvested after a year, which Seema will start harvesting post July. The staggered harvests have provided Seema a means of regular cash income, which has allowed her to plan the family's monthly expenditures better.

Seema was able to harvest 235 kg worth of vegetables in the Kharif season last year and 350 kg of vegetables in Rabi, which included the ginger and turmeric harvests. In summer, she harvested 215kg worth of produce. Seema earned Rs. 24,500 from the sale of vegetables produced on just 200 sq. mt. of her land.

Apart from the regular access to income, the multi-tier farm has allowed the family to consume vegetables daily. She delights in sharing that, her five children enjoy the variety in meals they consume now.

From the incremental income that she earned, Seema contributed a good portion towards the education of her children. She gladly admits that she and her husband do not have to work on other's fields now, as their own land is producing such a bounty. Buoyed by her initial success, Seema has expanded the area under multi-tier farming to 300 sq. mt.

Speaking about the vegetable harvests, she says that, since the produce is 100% chemical free, the vegetables are in high demand. Some patrons buy the vegetables from the field itself and the remaining portion is sold in the mandi 3 kms away from their village. She gets a premium price of her vegetables as regular customers are assured about the produce being pesticide free.

During the last year, SRIJAN has connected 126 farmers of 23 villages in Jatara and Palera blocks of Tikamgarh district with multi-layer farming technique.

HAQDARSHIKA

Shubha Ghose, enables community in her village through information and access to various government schemes and entitlements, ensuring that the benefits reach the last mile.

Shubha Ghose, is a MA, Sociology student from Bachhoda village, around 35 kms from district headquarters at Tikamgarh. A self-driven individual with a zeal to learn and help fellow community members, she has been associated with SRIJAN since 2019. While the Sociology degree college at Tikamgarh doesn't require her to undertake field work as part of its curriculum, she has been gaining hands-on knowledge of working in development by helping community members of her own village. She believes that this is the perfect combination of theory meets application. Her parents are small holders and practice sustenance agriculture. She lives with her parents and 2 siblings.

In June 2019, she first associated with SRIJAN as a Gram Sakhi. In this role, she was responsible for mobilising women in Self Help Groups, regularising savings, and overseeing implementation of agricultural projects of SRIJAN. She helped formulate 25 Self Help Groups in Bachhoda and Mau villages and provided farmers with agricultural inputs as part of her work.

In January 2021, she enrolled herself for a training program intended to develop, 'Haqdarshikas' or women field support agents. This program was launched by SRIJAN in collaboration with Haqdarshak to develop a cadre of community-based field support agents, who enable government scheme access at the last mile.

These women link community members to government schemes, by passing on knowledge regarding relevant schemes, and facilitate them in the submission of forms. In exchange of the services provided, they charge a small service fee from the community.

Shubha was trained along with 39 other women selected from across SRIJAN's work areas in Tikamgarh district through a 4-day training provided by Haqdarshak. The women were introduced to the Haqdarshak app, which is an android-based mobile application with information about welfare schemes, eligibility criteria and process of applying to the mentioned schemes.

The trained Haqdarshika has a one-tap access to all the information she needs to perform the job alloted. The user friendly interface in regional language allows ease of access to Haqdarshikas from anywhere.

Once trained, Haqdarshikas pass on knowledge regarding relevant schemes to women through the medium of monthly Self Help Group (SHG) meetings and to the general community at large through door to door visits. To close the loop, each trained Haqdarshika is linked to a computer centre.

Haqdarshikas facilitate the community members in filling the forms and collect the required identity proofs and other documents from the community. She visits

the computer centre with a bulk of the forms for photocopying and online form submission on various portals. The offline forms are submitted at the Panchayat office, where she regularly follows up with the secretary to know the status of the application.

Post the training, Shubha started her work as Haqdarshika for Bachhoda and Mau villages. She attended monthly SHG meetings of 25 self help groups and informed women about welfare schemes such as Ayushman Bharat, PM Jeevan Jyoti Bima Yojana and Sukanya Samriddhi Yojana.

She also helped process basic entitlements, such as old age and widow pension, and provided knowledge on getting Pan card. Linking BPL families to ration cards by activation of delinked or old ration cards was also undertaken by her.

Apart from her daily rounds, wherein she collected applications and documents from community members, she was also contacted at her residence for information on schemes. Within a period of less than six months, the community members have started looking upon her as a sort of repository on government welfare schemes, a fact she proudly shares.

By April 2021, Shubha had helped 500 community members to get Ayushman Bharat cards, which provide health cover of Rs.5 lakhs per family per year, allowing poor people to access quality health care and meet hospitalization expenses with ease.

'A woman in Bachhoda had met with an accident, that had badly injured both her legs, she underwent surgery and the hospital expenses incurred were in excess to Rs. 2,00,000. Due to Ayushman card, she was able to get the best treatment and not worry about the expenses.' - Shubha Ghose

Shubha shares this incident with pride as she had processed the application for Ayushman bharat card in the above case.

Apart from this, she has helped 20 community members get a PAN card and 15 mothers have registered under Sukanya Samriddhi Yojana. Her earnings for the first three months were Rs. 7500. However, post this, the second wave of COVID-19 led to a drop in work as the stringent lockdowns made movement difficult. Shubha mentions that, as things are slowly returning to normal, she has started processing applications again.

As of March 23, 2021, the total Haqdarshikas operational in different villages of Bundelkhand are 48, who have processed 4800 applications under various government schemes, out of which 1849 beneficiaries have received benefits to the tune of Rs. 1.59 crores.

Post completion of her MA in Sociology, Shubha wants to work for SRIJAN or some other grassroots organization, professionally. When asked the reason for her career choice, she shares smilingly; *'paisa thodi sab kuch hai, logo ki madad bhi zaruri hai'*.
'It is not about money, it is also important to help people'. SRIJAN needs more local champions like Shubhi for sustained impact of their interventions.

DOHA

Dohas are saucer-shaped pits dug in the bed of the stream, along its length, to rejuvenate the stream and increase its water storage, as well as, recharge capacity. SRIJAN has been excavating Dohas in seasonal streams to provision water for livelihoods to small and marginal farmers of Bundelkhand region.

Introduction

Bargi river passes through Dor and Kharoi villages of Jatara block in Tikamgarh district, Madhya Pradesh. A seasonal river, it holds critical importance for small and marginal farmers of both villages, who depend upon its waters to irrigate their crops during dry spells in Kharif, and 1-2 times in Rabi season. *Bargi nala,* as locals call it, is the lifeboat for farmers in times of critical irrigation requirements. However, the nala/stream is seasonal, and dries up in January or February. Farmers recall it being a perennial stream many years ago, when it had some water even in the month of May.

What is Doha?

In 2019, a few of SRIJAN's personnel, along with community leaders, visited contextual examples of *Doha model* in Maharashtra. *Doha,* known as *'doh'* in marathi, refers to saucer-shaped structures dug in the stream bed, along its length, separated by some distance. The lowered base-level leads to storage of more quantum of water, thus ensuring longer availability and improves the recharge capacity of the stream.

The SRIJAN team along with the community members decided to contextualise their learnings as per local topographic conditions to provision irrigation to small holders in water-scarce Bundelkhand region.

Implementation Process

In 2019 , SRIJAN initiated the process to implement Dohas on Bargi nala. Community mobilisation was the first step of the journey. Meetings were held with community, where community leaders and SRIJAN team shared their learnings from the visits and elicited interest, among village community, regarding Doha construction. Once farmers were convinced, joint surveys of streams were undertaken to identify feasible sites.

Post the identification of sites, collective planning processes were undertaken, to ensure that the implementation is a community-led process. SRIJAN team contributed technical and engineering knowledge regarding depth, length and width and location of Dohas along with providing for excavators. The community was responsible for doha excavation operations, contribution of labour for transport and application of silt in farms, and bunding of the Dohas.

23 Doha structures, measuring 20x5x1.5 mt (lxbxd), were dug along a 3-kilometre stretch of the Bargi nala, flowing between Dor and Kharoi villages. The silt excavated was applied by interested farmers in their fields or used for field bunding.

Cost Estimates

The average expenditure incurred per Doha was as follows; Rs. 15, 000/Doha towards excavator(JCB) charges provided by SRIJAN and Rs. 6000/doha towards tractor charges for silt transport, provided by community.

The Impact

Within a year of constructing Dohas, the baseflows of Bargi river had improved tremendously. The nala that used to dry in February, now has water till May. 150 farmers from these villages, who have their land in proximity to the Dohas have directly benefitted, as they now have a secure irrigation source for Rabi cultivation.

40 farmers who had applied silt to their land had reported improved yield of both Kharif and Rabi in 2020.

Apart from this, 60 farmers with wells downstream were benefitted through enhanced groundwater recharge. 60-70 wells located within a distance of 0.5 km downstream, have reported improved water-levels. SRIJAN team had monitored 10 wells for an year, from May 2019 (before Doha) to May 2020 (after doha). Post a year, the groundwater level had improved by 0.3-0.5 metres in the monitored wells.

Farmers using wells reported that they could irrigate their land within an hour, compared to 1.5-2 hours before. Some wells, which dried post March, were reported to hold water uptil May. This led 12 farmers to take up vegetable cultivation in summer season leading to an incremental income of 12,000 INR/farmer. Two families, which saw 100% migration in 2019, now stay and cultivate *arbi* (taro root).

Farmers, who were able to irrigate their land in rabi season, secured irrigation 3-4 times as compared to 1-2 times before Dohas. According to internal evaluation of the SRIJAN team, this led to a yield increment of 0.75 tonnes per ha valuing 14,473 INR.

Sustainability

Since Dohas are constructed in the bed of the stream, they are prone to constant silting and require regular maintenance for functioning at optimal capacity. The assumed life-span of these structures without maintenance is 4-5 years, which makes community participation an inalienable aspect for sustained benefits of Dohas.

Cognizant to this, SRIJAN has formed Doha user-groups, comprising 2-3 farmers/Doha, who directly irrigate their fields from the structure. These user-groups have been entrusted with the responsibility to desilt the Doha under their ambit, every year in the pre-monsoon season.

SRIJAN has over the last two years, rejuvenated 10 streams through construction of 88 Dohas, thus benefitting 434 farmers in the Bundelkhand region. The organisation has presented their work to district administrations, for scaling up the intervention under national-level programmes, such as MGNREGA.

MOVING TOWARDS CLIMATE SMART AGRICULTURE

Age is just a number. At the age of 56, Ramesh dada has proved this by leading his village towards natural farming practices by producing organic manures and pesticides for fellow farmers, and guiding them on best practices for low-input Climate Smart Agriculture.

Ramesh 'dada', as he is lovingly referred by everyone in the village, is a veritable changemaker. A resident of Thurat village in Mahoba district of Uttar Pradesh, he has gained recognition from outsiders and respect from farmers of his village. At the ripe age of 56, when most people think of retiring from active work life, Ramesh dada has inspired many by his progressive and conservation-oriented mindset.

He is a strong advocate of afforestation, and has over the last decade regenerated a small hillock near his village. He initiated the planting and protecting saplings on a small parcel of common land which was completely degraded. He faced a lot of resistance from community when he started but once the villagers saw the benefit of the regenerated forest, everyone supported the initiative. Goats of 4 nearby villages now graze the regenerated forest spread over 1800 acres.

In 2018, Ramesh dada got interested in trying out the Climate Smart Agriculture approach being promoted by BIWAL partners in Mahoba district. He wanted to reduce input costs of agriculture.

In rabi season, he experimented by cultivating wheat on 1 bigah (0.25 hectare) of land as per the Climate smart agriculture practices which are based on principles of regenerative organic agriculture. These include no tillage, minimum soil disturbance, use of organic fertilizers and bio pesticides, intercropping, crop diversification and rotation, and eliminating chemical inputs and fertilizers.

Dada cultivated wheat on his demo plot with a lot of dedication, producing organic manures and biopesticides, and doing all what was advised by the team. He was however, apprehensive of the production levels. Contrary to his expectation, the demo plot did remarkably well. He got the same produce as he got from conventional practices but the input cost was markedly lower.

So happy was Ramesh dada with the results that he determined to undertake Climate smart agriculture on his entire land holdings of 36 bigah (9 hectares). As Ramesh dada owned 30 odd cattle, he decided to produce all the organic fertilizer and bio pesticides himself.

When he set out to execute his plans, he realized that it was an uphill task to collect cow urine, a key ingredient in organic manure making process. He approached the organization for support. The BIWAL partner decided to promote Ramesh Dada as a lead farmer to leverage his image as popular leader due to his conservation efforts.

He was provisioned with material, equipment and infrastructure support to set up a *Prakritik Krishi Kendra (*Natural Manure and Pesticide Management Unit).

Prakritik Krishi Kendras are promoted by SRIJAN at gram panchayat level to encourage farmers for adoption of Climate Smart Agriculture. The aim is knowledge transfer, field-level demonstrations, and preparation of bio-pesticides etc. It can be thought of as a living laboratory where farmers learn from each other through experimentation, and shared experiences.

The cattle shed of Ramesh dada was provided with concrete flooring and proper drainage, along with a sturdy shed roof, and proper ventilation. Fodder and watering containers, green fodder seeds were provided, along with drums and plastics for storing the natural fertilizers.

Ramesh dada initiated work with great dedication and within a short time produced a good supply of *Jivamrit* (organic manure), *Dhruvamrit* (liquid organic manure) and Neemastra (a bio pesticide).

He distributed these to the farmers of his village free of cost to get them interested in Climate Smart Agriculture. He also maintains a one-acre demonstration plot for field experiments of new crop varietals. The organisation provides knowledge about best practices to farmers through monthly meetings at his farm.

He is emerging as a role model in his village for low-input chemical free Climate smart agriculture. 15 farmers of his village have turned to Climate Smart Agriculture due to his efforts. He has been interviewed by local and district-level media for his dedication towards the cause.

Ramesh Dada proves that, change can be brought at any stage of life and that there is no retirement age for people with a vision and steadfast determination.

A PROGRESSIVE FARMER IN THE MAKING

Ramshankar Yadav, a small farmer from Chitrakoot district, not only improved the economic condition of his family, but has is also leading the way for fellow villagers to adopt Climate Smart Agriculture practices.

Ramshankar Yadav, a resident of Parai village of Chitrakoot district in Uttar Pradesh is a small holder with 3.2 hectares of land holding. However, most of this land is rocky and unsuitable for cultivation. He has 8 goats that provide additional income to the family in times of liquidity crunch.

Owning to the poor soil conditions, Ramshankar could only cultivate a portion of his land, which seldom produced food sufficient for household consumption, let alone serve as a source of income.

In 2018, BIWAL partners desilted an ancient *taalab* (tank) near the village in coordination with the village community. A Tank Management Committee (TMC) was formed for operational planning and implementation.

The huge amount of silt excavated from the taalab bed, formed after years of erosion processes is highly fertile. It has high amount of carbon and other macro nutrients and can be used by farmers to boost yields of their crops.

50 farmers of the village, including Ramshankar, elicited interest in using the silt in their fields. The transportation of silt and the associated expenditure was borne by the farmers themselves.

Ramshankar applied the silt to his entire land holding and in the Kharif season, cultivated paddy on a small portion of his land. The yields were much higher than he had experienced before. Hope ignited within his heart about the potential of his land to produce food.

Ramshankar would regularly and actively participate in the agriculture programme of the organization and showed great interest in learning about Climate smart agriculture practices. He learned the technique to make organic manure and bio pesticides using cow urine and cow dung.

In the subsequent rabi season, he enriched his land with the organic manures prepared by him, and to his surprise, he got astounding produce with very less inputs.

His income increased and his family had enough food reserves to last an entire year, which was a welcome change to the food insecurity his family was previously exposed to.

The proactiveness of Ramshankar and inquisitiveness to experiment led to his recognition as a progressive farmer. 3 farmers of his village have adopted Climate smart agriculture practices following his example. This led BIWAL partners to promote Ramshankar as a lead farmer. He was provided support to set up a *Prakritik Krishi Kendra (*Natural Manure and Pesticide Management Unit).

A *Prakritik Krishi Kendra* is promoted in a entrepreneurial model wherein initial cost of setting up, including infrastructure and

materials, knowledge transfer, extension material, etc. is provided by BIWAL partners.

He produces organic manures and bio pesticides in bulk in the Prakritik Krishi Kendra, for use on his own farm and for selling to others. Initially, he distributed the inputs for free to encourage more farmers to adopt the low-input, chemical-free agriculture practices.

There is a small demonstration plot established on his farm that has been set up for farmers to try out new agricultural techniques and learn through experimentation. Every month, farmers of the village gather at his farm to learn about various practices under Climate Smart Agriculture. They discuss techniques to prepare organic inputs, concept of no-tillage, mulching, inter-cropping, new crop varietals, seed treatment and to share experiences.

This year, Ramshankar is experimenting with multi-tier cropping, a system in which fruit and vegetable crops of varying heights are cultivated in a dense format to use space effectively, and produce more food with less inputs. Limited land requirement, and optimum utilization of water and manure are the key features of the system. Also, as different crops have different harvest cycles, the farmers stands to earn cash income throughout the year from the staggered harvests.

Ramshankar is hopeful that other farmers will soon follow and replicate these methods that have greatly helped him ensure food and economic security for his family.

His story is an inspiration for all the farmers with fallow and unfertile soil. He proved that with hardwork, and adoption of Climate Smart Agriculture practices, a fallow land can provide bounties of food and enrich agriculture-based livelihood.

FROM SNAKE CHARMER TO FARMER

Dwarika turned to agriculture after the income from his ancestral snake charmer profession started dwindling. He got good returns from his first attempt at settled farming, thanks to the fertile silt excavated from an ancient taalab/tank.

Dwarika was a nomadic snake charmer like his ancestors. He learnt the craft from his father, who used to catch poisonous snakes from the forest, and entertain the village communities living in nearby areas in return for food or money. It was the only source of livelihood known to Dwarika having grown-up around snakes.

In 1990, Dwarika's family came to Hata village for the purpose of attending the annual meet of snake charmers held in Chitrakoot at Deepavali.

Post the event, the family of Dwarika settled in Jata village of Chitrakoot district. In 1993, the local government transferred the ownership of 5 bigah (1.25 hectares) land in the name of Dwarika's father, Mulhnath. But, as the land was fallow, it lay uncultivated. Also, due to lack of agriculture knowhow, Dwarika continued his father's profession by catching snakes in the nearby forests and entertaining community members of nearby villages, as a snake charmer.

Due to the strict enactment of wildlife protection laws, and increased awareness among people about wildlife conservation, the lure of the snake charmers is becoming a thing of the past. This has led to dwindling incomes for people like Dwarika.

In 2016-17, a BIWAL partner initiated work in Hata village on a education programme, which sponsored education of talented and resource-poor children. Dwarika's daugther Karena, was also shortlisted for sponsorship under the programme. This encouraging support given to his daughter built Dwarika's trust in the organization.

He started attending the meetings held by the organization in the village, which related to village-issues such as lack of irrigation, agriculture, etc. In one of the meetings he shared his inability to cultivate the land due to shallow, rocky soil in the land alloted.

In 2019, the BIWAL partner launched the work of desilting Khamboli taalab, a big ancient water harvesting structure near the village. A Tank Management Committee (TMC) was formed having membership of all interested farmers of the village, and represented by 15 odd members, selected for making decisions on behalf of the community. An important task of the tank management committee is the transportation of the excavated silt from the tank bed to fields of farmers.

Interested farmers submit their names for silt deposition to the TMC. The cost of silt transportation is borne by the farmers themselves. Dwarika elicited interest in silt deposition and arranged for transportation of 30 trolley of silt on his entire land. The silt excavated from taalab beds is known to have high amount of macro nutrients and carbon that leads to improved soil health.

Dwarika witnessed firsthand the effect of silt on crop production. He cultivated mustard

and had a bumper harvest of 7 quintal from his meagre landholding. He sold the mustard at the rate of Rs. 5000 per quintal thus realizing an income of Rs. 35,000 for the first time that he practiced agriculture.

This income provided his family with food security for an entire year, as he purchased wheat, rice and dal from the income realized.

He now wants to practice agriculture as a livelihood. He actively participates in the meetings held by the organization and is eager to learn best practices of agriculture that reduce cost and boost yield.

Although, he currently does not have a source of irrigation and practices only rainfed Kharif cultivation on his land, he is preparing a small kitchen garden on his homestead land for household consumption.

Since the past two years, he has also started working as a farm labourer on the field of others during rabi season which supplements his income and provides with an avenue to learn about agriculture.

LEADING HER VILLAGE TO PROSPERITY

Sashi Prajapati, the gram sakhi of Kudar village, is turning the face of agriculture around by training farmers on Climate-smart cultivation practices. Along with that, she also provides preventive veterinary care services to the village. She is improving the livelihoods of her fellow villagers by improving knowledge on agriculture as well as animal rearing practices.

Sashi is a denizen of Kudar village of Niwari district situated in the Bundelkhand region. The Bundelkhand region comprising of thirteen contiguous districts, seven located in Southern Uttar Pradesh and six districts of Northern Madhya Pradesh, has a recorded history of droughts and severe water scarcity. The region is bereft of any river systems and adverse geological conditions leading to suboptimal recharge.

The ancient kingdoms were aware of the problem and understood that water security could only be ensured if the rainfall was efficiently harvested. To harvest this rainwater, a large number of taalabs were built by local communities and financed by Chandela and Bundela kingdoms in ancient times. These tanks served as a lifeline for the people of the region for centuries. However, due to the change in ownership of these structures from community to the government, the tanks fell in disrepair and disuse since the colonial period.

Small and marginal farmers of the region continually face water scarcity today due to excessive dependence on groundwater resources. The BIWAL project was initiated with the aim to revive the traditional water harvesting structures and promote agriculture practices which are sustainable both on the front of input and water usage.

Under the said project, the *Purania taalab* in Sashi's village was desilted and revived in the summer of this year(May-June 21). A tank management community comprising of village community was set up which oversees its management and maintenance.

Sashi played a crucial role in the desilting process. As a *Gram Sakhi* of the village, she encouraged people to use the silt removed on their land to improve its fertility. She also maintained the meticulous records of farmers who deposited silt on their fields making detailed entries of the name of the farmer, number of silt trolleys and date of silt transfer. She regularly monitors the water level of the wells of the village to understand the effect of the tank revival on groundwater recharge.

Sashi is also a progressive farmer and was quick to adapt the climate-smart agriculture practices promoted by SRIJAN. She used organic fertilizers concocted by her on the Kharif crop and yielded the same amount of harvest as by using chemical fertilizers.

Seeing her interest and proactiveness, SRIJAN decided to promote her as a lead farmer and supported her in setting up a *Prakritik Krishi Kendra* on her premises. Her cattle were provided with a better home with concrete flooring and proper drainage along with a sturdy shed roof and ventilation. Her four cows provide her with enough raw material (cow dung and urine) to concoct organic inputs for the interested farmers of her village.

During this Kharif season, Sashi developed 40 quintals of *Ghanjivamrit* and 1600 litres of *Jivamrit*. She sells this to the farmers at the rate of Rs.7 per kg for Ghanjivamrit, and Rs. 10 per litre for Jivamrit. The farmers of her village used these inputs on their mung and urad fields to good results.

She maintains 1-acre land of her field as a demo plot. The purpose of a demo plot is to try out new package of practices, better seed varietals, etc., and methodically study their effect. This allows the farmers to scientifically test out new approaches and adopt the best practices as per their own observations.

She proactively encourages farmers to adopt practices which reduce inputs and improve yields by visiting the farms and interacting with women who most often do most of the farming work. The women farmers also gather on her farm for monthly meetings to discuss improved package of practices on the basis of the current crop cycle stage. For example, pre-sowing meetings are held to discuss the best time for sowing, seed treatment, land preparation etc.

She is currently encouraging farmers to try out multi-tier farming on a small plot of their land. Multi-tier farming allows for the growth of various types of vegetables and fruits in a small area by optimum use of vertical space through cultivation of crops of varying heights in the same field.

Apart from being a agriculture spokesperson of her village, she also wears another hat. She is the para vet of Kudar and provides preventive animal health care for small ruminants and poultry. In the month of July, she performed the deworming of 78 goats after receiving the necessary training from SRIJAN.

Sashi, a outspoken and hardworking woman, represents the new face of rural India. More power to women like her who are slowly but surely turning the long-held patriarchal wheel of the society.

SILT APPLICATION IMPROVES AGRICULTURE YIELDS

Prakash became a member of Tank Management Committee which led to rehabilitation of an ancient tank. His association with the organization made him shift to natural methods of farming and eventually he emerged as a lead farmer of his village promoting sustainable agricultural practices to fellow villagers.

Prakash Kirkoti, a progressive farmer from Sarangpura village of Mahoba district was among the first to support the rehabilitation of an ancient tank in their village. He realised its benefits from the initial meetings and discussions held by Arunoday Sansthan.

A Tank Management Committee (TMC) was formed in the village to allow for participatory planning and execution of the tank rehabilitation works. Prakash volunteered to become a member of the committee and played an active role in the tank restoration process.

While Arunoday Sansthan was responsible for desilting the ancient taalab (tank), the TMC was responsible for transferring the silt from the tank site to the fields of farmers. The TMC members thus had a major role in convincing farmers to transfer the silt at their own expense to their fields.

Prakash led by example and was amongst the first to register his name for transferring silt on his 2 bigah land holding. The land owned by him was rocky and uneven. Due to this, he always had poorer yields compared to other farmers. He deposited 200 trolleys of silt on his entire farm at a cost of INR 20,000.

This led to levelling of his field and enrichment of soil. He encouraged fellow villagers to contribute in and vouched for its benefits which were observed by a surge in productivity of his farm.

Prakash's association with Arunoday Sansthan through the Tank rehabilitation work built his trust in the organization's work and he started regularly attending the agricultural meetings held by the organization.

He learnt the technique to make natural manure using cow dung and urine. He applied this to his field and witnessed a viable increase in production. Not only this, but he also saved around INR 4000 which he spent upon chemical fertilizers and pesticides.

He also encouraged fellow farmers to adopt the natural methods of cultivation, and has now emerged as lead farmer of Sarangpura. He disseminates information about better package of practices, methods to prepare and apply organic fertilizers, efficient sowing and weeding methods, and other agriculture-related knowledge gained through capacity building sessions with the organization's experts.

Along with foodgrain cultivation, Prakash has adopted multi-tier farming on a small plot of his land. It is a method of cultivating various types of vegetables and fruits in a small area by optimum use of vertical space through cultivation of crops of varying heights in the same field.

Prakash reaped decent harvests of tomatoes, chilli and spinach from his small land holding. This has not only ensured nutritional

security for his family of four but also led to an increase in income.

As a result of the improvement of soil health due to application of silt and natural manure, and the diversification of cropping due multi-tier farming, Prakash earned INR 1,00,000 in the previous 12 months. This has contributed to an increase in the overall standard of living for the family.

Prakash has emerged as a role model for farmers in his village and is a voluble promoter of natural methods of farming. As a lead farmer of Sarangpura, he has encouraged over a dozen farmers to adopt organic fertilizers and pesticides.

STREAM DEEPENING IMPROVES YIELDS

Mamta Adiwashi, a tribal farmer and farm labourer from Namapura village has been able to cultivate her entire land-holding this year. This is not a common occurrence. She cultivates only a part of her land during rabi season as she has to purchase water for irrigation. Thanks to the Dohas excavated in her village, she has a assured source of irrigation now.

Mamta Adiwashi is a tribal farmer and farm labourer from Namapura village of Niwari district in Madhya Pradesh. The household consists of her two children and husband. The family has 6 acre of land holding but due to lack of access to irrigation, only a part of it is cultivated in Rabi. For irrigation purposes, the family has to purchase water at the rate of 1250/acre for a single irrigation. They incur a cost upwards of Rs. 6000/season just to ensure water for their crops.

A seasonal stream flows by Mamta's farm which plays a crucial role during long dry spells between two consecutive showers in Kharif season. Mamta and many other farmers of the village who have land parcels adoining the stream turn to it for ensuring the survival of their crops. Most small farmers such as Mamta depend upon a good kharif harvest to ensure sufficient production for annual household consumption.

While this stream plays a crucial role in Kharif cultivation, it dries up around October. Mamta and other marginal farmers from Namapura who have no irrigation sources of their own, resort to purchasing water at exorbitant rates for rabi cultivation.

Despite labouring year long in her farm, she is unable to meet the domestic consumption requirements of the household. She also works as a farm labourer in other farmers' field during harvest season to bring home some extra income.

SRIJAN has been working in the Niwari district of Madhya Pradesh under the BIWAL project supported by Indusland Bank since February 21. In the month of May, work in Namapura village was initiated by SRIJAN on Climate-smart agriculture. In the initial meetings with the village community, the need for ensuring irrigation to the small and marginal farmers, especially the tribal community of the village (comprising of Shor and Adiwashi tribes) became apparent.

The field workers saw potential in the stream which passed through many farms of the village. Construction of Dohas in the stream to improve its life was agreed upon as the appropriate intervention.

Dohas are saucer-shaped structures dug in the stream bed, along its length, separated by some distance. This leads to lowering the base-level of the stream which allows for more quantum of water to be stored. This improves the life of the stream and also its recharge capacity.

SRIJAN has been implementing Dohas for the past two years on various streams and has a good success rate at both ensuring irrigation access to marginal farmers and improving the overall stream health.

Various meetings with the community were held to dig the Dohas. Water user

groups were formed of all the intended beneficiaries; farmers with fields adjoining the stream as wells as farmers with wells within 1 km radius of the Dohas. In all, 14 Dohas were dug in the stream bed for the section of the stream passing through Namapura. SRIJAN provided support in the form of excavation charges of the JCB while the community provided voluntary labour to make doha bunds on both stream banks and transfer the remaining silt from the stream bed to their farms.

Mamta's farm has access to 3 dohas adjoining her farm and that of her in-laws. In Kharif, they used the Doha waters to provide a support irrigation to their groundnut crop as there was a long dry spell post the first showers. They had a good harvest of groundnut. 15 quintal from 4-acre cultivation of the crop. On the remaining land they had grown Urad and mung dal, which were however destroyed by untimely heavy rains.

In rabi, Mamta has cultivated wheat as the main crop with intercropping of mustard on ther entire 6-acre landholding. She has also as of yet provided the crop with two irrigations using the waters of the Dohas at hand. Infact, post the construction of the Dohas, not a single person in the village has had to buy water for irrigation which is a big respite for most marginal tribal farmers. 34 farmers of Namapura are irrigating their fields due to the construction of Dohas.

Since, this is the very first year post the digging of Dohas, it is too early to estimate the impact on incomes and the water conservation potential. The SRIJAN team is collecting regular data on various parameters such as increase in well water levels, etc. and the initial results show that well water level has improved by half a metre in most wells.

The organization is also supporting tribal farmers of the village in adoption of Climate-smart practices. Mamta planted bamboo saplings provided by SRIJAN on bunds of her farm this year. This will most likely help her earn some extra income financially but it will also help improve soil moisture health of her farm.

NATURAL FARMING CENTRE

Vandana and Surendra are Climate-Smart Farmers of Bahera village, and the harbingers of change in the current chemically-intensive methods of cultivation. They are natural farming entrepreneurs concocting organic manures and bio stimulants for farmers of their village.

Vandana Kushwaha and her husband Surendra have been forerunners of Climate-Smart Agriculture in their village. Piqued by the concept of improving agricultural returns through adoption of natural farming methods, Vandana and Surendra actively began participating in agricultural trainings and meetings held by SRIJAN. They learned the method to concoct natural fertilizers such as *Ghanjeevamrut, Jeevamrut* and pesticides; *Neemastra and Dasperni Ark.*

They had promising yields in their first cropping season manured by home-made fertilizers, however, they faced a problem in efficiently accumulating cow urine which is a key ingredient in the organic manure making process.

They approached SRIJAN with the challenge and the organization offered to support the in setting up a Prakritik Krishi Kendra on their farm. They elicited their interest in setting up a Prakritik Krishi Kendra in front of the Village Development Committee (VDC). Since they had 8 cattle and were interested in making fertilizers for other farmers as well, the VDC accepted their request.

In order to set up a Prakritik Krishi Kendra, their cattle shed was renovated. Concrete flooring with proper drainage and a gentle slope was provided for ease of cow urine collection. A sturdy shed roof and adequate ventilation were also provided.

Fodder and watering containers, green fodder seeds were provided, along with drums and plastics for storing the natural fertilizers.

In their first Kharif season post the setting up of the Natural Farming Centre (*Prakritik Krishi Kendra),* they produced 1000 kg of Ghanjeevamrut, 800 litres of Jeevamrut, 200 litres of Neemastra, and 200 litres of Dasperni Ark.

They proactively encourage farmers to try out organic inputs on crops and also give out free samples for trial. Within the first season as organic entrepreneurs, they have managed to convince over a dozen farmers of the benefits of Climate-Smart farming techniques.

They sell Ghanjeevamrut at INR 4/kg which is very economical for farmers compared to chemical fertilizers which cost over INR 2500 per acre. The couple is also selling cow urine at INR 5/litre to encourage farmers to make their own fertilizers.

The Prakritik Krishi Kendra acts as a knowledge transfer hub for building the capacities of farmers on climate-smart agriculture practices. The farmers conduct regular meetings at the Prakritik Krishi Kendra. Apart from trainings, the farmers also meet regularly to share experiences and learnings.

The couple maintain a 1-acre plot on their field for demonstration purposes. In the Kharif season, they had cultivated improved variety of groundnut without use of any chemical fertilizers or pesticides. They used organic manures, bio stimulants and bio pesticides concocted by them. The demonstration plot groundnut had a handsome yield, and since most farmers had seen the results first hand they were convinced of the efficacy of the natural fertilizers.

Their P*rakritik Krishi Kendra* can be thought of as a living laboratory where farmers learn from each other through shared experiences and experimentation.

Vandana and Surendra are planning to go 100% chemical free on their entire farm holding of 3-acres.

They are viewing this as a strategic move which will encourage more farmers to follow their lead and thereby enable their natural farming centre to not only serve more farmers but also to limit the harmful effects of chemical fertilizers on food, health and overall well-being of the community.

MULTI-LEVEL VEGETABLE FARMING BRINGS PROSPERITY

Phulbai Chaddar's foray into multi-level vegetable farming helped her escape the drudgery of labour work and also ensured nutritional security for her family. She sold vegetables worth over Rs. 30,000 within the first six months of setting up her multi-level farm.

Phula bai Chaddar lives with her husband and in-laws in Dor village of Jatara block in Tikamgarh district. She practices subsistence agriculture alongwith her husband. They grow Mung and Urad dal during Kharif season on their 4 acre landholding, which is mostly used for household consumption. In rabi, depending upon the availability of irrigation water, they cultivate Wheat, gram and/or peas. Phula bai used to cultivate these crops with the help of chemical inputs; chiefly Urea, DAP and pesticides. Due to these practices, she incurred a high input cost.

The resultant income was often not enough to support the household expenses for the entire year. Phul bai and her husband often undertook work as farm labourers to support their family.

Last year, Phula bai attended a farmer's training organized by Self-Reliant Initiatives for Joint Action (SRIJAN), where she learnt about multi-level farming, a method to grow compatible plants of varying heights on the same plot of land. She was intrigued by this method, but her inexperience in vegetable cultivation kept her from trying out mutli-level farming on her land. However, a family in the village had grown vegetables using this method and had received good returns. While visiting the mutli-level farm of the village, Phulbai became convinced of its worth.

She enlisted herself among the farmers willing to set-up multi-level farms in the subsequent farmer's meeting and in the month of February 2021 set up her own Multi-level farm on 200 sq. mt. land with technical guidance and support from the organization. SRIJAN supported Phula bai by providing bamboo poles and wire for setting up the trellis, and the seeds of vegetables to be planted on the miniature farm.

Phulbai initiated her foray into vegetable farming with a three-storied multi-level farm. In the first layer, she sowed the tubers; ginger, carrots, radish and beetroot, which grow underneath the surface of the soil. Next, she planted tomatoes, chillies, coriander, and spinach as the second layer. Creeper vegetables formed the third layer. Bottle gourd, bitter gourd, ridged gourd and cucumber were planted. A bamboo trellis was set up by Phulbai and her husband to support these creepers and also provide shade to the leafy vegetables of the first and second layer.

Phulbai and her husband received trainings along with other vegetable farmers upon crop combinations, bed preparation, farm-layout, vegetable growing calendar, manure and bio-pesticide preparation techniques.

A unique characteristic of the multi-level farms promoted by SRIJAN is their low-input cost despite the high crop density and cultivation of fertilizer intensive vegetables.

The need for nourishment and manuring of these crops is met by preparation of natural and organic fertilizers, bio stimulants

and bio pesticides; such as Jeevamrut, Ghan jeevamrut, Neemastra, Dasperni Ark, etc.

Phulbai sowed the first batch of vegetables in the month of February 2021. She first harvested spinach and coriander in April-May. Post this the creeper vegetables, and tomatoes along with chilli were harvested June-July 21. Tubers are late germinating and were harvested last by mid September. These staggered harvested ensured a regular source of cash income for Phul bai's family which eliminated the need of labour work.

Phulbai and her hudband sell vegetables worth Rs.200-300 every alternate day. As their vegetable are chemical free, they do not face any difficult in selling their produce. Infact, some patrons visit their farm to buy chemical-free vegetables.

Within the first six months of initiating multi-level vegetable farming, Phulbai sold vegetables worth Rs. 30,132. She and her husband are delighted with the fruit of their labour and are planning to expand the area under multi-level farming this year. Phul bai has already sowed the seeds for second round of vegetable in October 21.

The multi-level farm has not only resulted in economic prosperity but ensured that the famiy has colourful nutritious meals every day. Also, the expenditure incurred on purchasing vegetables has reduced substantially.

Multi-level vegetable farming has brought both income and nutritional security to Phulbai's household.

During the last year, SRIJAN has connected 126 farmers of 23 villages in Jatara and Palera blocks of Tikamgarh district with multi-layer farming technique.

DESILTING HISTORICAL TANKS ENSURES WATER AND IMPROVES YIELD

Dasrath Yadav, a resident of Kudar village of Niwari district, reaped double yields after applying silt excavated from the historical Bundela tank in his village. The tank has not only assured water for irrigation but also improved the quality of the soil of the village thus leading to bumper harvests.

Bundelkhand is littered with thousands of tanks that were built during the reign of Chandela and Bundela kings. The tanks harvested water for domestic use, recharged groundwater and provided downstream irrigation. More significantly they provided water security for the inhabitants during years of scarcity.

Today, Bundelkhand is characterized by extreme poverty and water scarcity. The age-old tanks fell into disuse in the period of British rule. Excessive use of groundwater for irrigation incentivized by subsidized pumps and electricity had led to over-extraction of the resource, with the result of most wells running dry a few months post-monsoon.

The Bundelkhand Initiatives for Water, Agriculture and Livelihoods, a multi-stakeholder partnership of government, non-government, academic and research organizations; was formed with the aim to restore, and revive the tank culture of the region. Under the project, the task of tank rehabilitation is undertaken in collaboration with local communities who are handed over tank management post the rehabilitation of the structure.

Tank Management Committee, an executive body formed of democratically elected village representatives is formed for ensuring community participation. Kudar village of Niwari district in Madhya Pradesh had a Bundela tank which was in a state of disrepair. The tank was repaired in 2021 through desiltation and repair of tank weirs. While the cost of tank desiltation was covered by SRIJAN, the responsibility of transfer of silt from the tank site to farmers' fields was that of the community.

54 year old Dasrath Yadav is a handicapped farmer with 6.5 bigha of land holding and 6 family members to support. The land parcel owned by him had inferior quality soil which led to suboptimal production. Also, due to unavailability of water source, he cultivated only a portion of his land during rabi season.

He opted for transferring 54 trolleys of silt and applied it on his entire field. He had expected some improvement in yield but the results far exceeded his expectations. Before the application of silt, he use to get 2-3 quintals of mungfali from his land but post silt application, his farm yield 6 quintals of mungfali production.

The repair of the tank has improved the harvests of many farmers of Kudar villages. Most farmers assert that having an assured supply of water for irrigation has reduced their constant fear of a failed harvest.

The added benefit of silt application has led to improving yields of a majority of the farmers who opted to share the burden of transferring silt from the tank bed to their farms.

SRIJAN is also promoting Climate- smart agriculture practices under the BIWAL initiative to stabalize rainfed agriculture and

ensure that small and marginal farmers make a decent livelihood from agriculture.

Regular meetings around agriculture are organized which promote the farmers to use good quality seeds and organic inputs to reduce the chemical intensive agriculture which has led to erosion of soil fertility of the region.

Farmers are slowly embracing the practices promoted by the organization. Dasrath Yadav is one of the enterprising farmers who has adopted the use of organic manures and bio pesticides on this farm.

VEGETABLE FARMING FOR LIVELIHOODS AND NUTRITION

Kusma devi, a marginal farmer from Uttar Pradesh adopted mutli-level vegetable farming on 200 sq. mt. of her land and earned Rs. 40,000 from the first batch, which is more than what she earns from growing food crops on her entire 2 bigha land holding.

Kusma devi, a marginal farmer from Makrab village of Hamirpura district in Uttar Pradesh owns 2 bigha of land. 3 married sons eke out a livelihood by driving rickshaws as labourers. Kusma devi and her husband practice subsistence farming on their meagre land holding. In Kharif they grow groundnut and in rabi, cultivation of wheat for household consumption is undertaken. However, in recent years, they have had poor harvests leading to losses due to high input cost on fertilizers and pesticides.

The Yuva Kaushal Vikas Mandal (YKVM), an NGO partner under the BIWAL initiative spearheaded by SRIJAN undertook an awareness campaign in the village on natural farming and multi-tier farming approaches. The organization also formed a farmers group for conducting regular meetings and trainings on agriculture and related livelihood enhancement. Kusma devi joined the club and started attending meetings regularly.

In these meetings, she got more information about multi-level farming and got interested in the concept. She talked about setting up a multi-level farm with her husband, but due to resource constraints, they stepped back.

In the subsequent farmer's meeting, Kusma devi expressed her interest in setting up multi-level farm on her land and shared that she didn't have enough resources to build the trellis needed. The organization and farmer club members agreed upon selection of Kusma devi as a beneficiary for the multi-level farm intervention.

A 30x45 feet land parcel from their total land holding was selected for setting up the multi-level farm. Bamboo, wire and green net for setting up the trellis were provided by the organization, whereas the labour needed to set up the trellis was contributed by Kusma devi and her husband. They were also given vegetable seeds of ginger, radish, ridged gourd, bitter gourd, bottle gourd, spinach, lady finger, cucumber, and pumpkin, which they sowed strategically at varying depths in their multi-level farm.

Mutli-level farming is a method of cultivating compatible plants of different heights on the same plot of land by sowing at varying depths of soil. The crops selected have different harvest cycles which help the household have continuous cash flows and nutritional security throughout the year.

Kusma devi sowed radish and ginger as the ground layer, followed by spinach as the first layer. Ladyfinger was planted as the second layer and the creepers of the gourd family were planted as the third layer. Pumpkin was sowed as the final layer of the multi-level farm.

Kusma devi and her husband received trainings regarding crop combinations, bed preparation, farm-layout, strategic sowing, seasonal calendar, manure, and bio-pesticide preparation techniques.

They prepared the organic manures and bio-stimulants themselves and did not buy any external chemical input.

Kusma devi had sowed her vegetables in June, and started getting her first harvests in august. She harvested spinach first. The creeper vegetables started bearing fruit in September. Kusma devi recalls having a bumper harvest of all the gourds. Around October lady fingers were ready to be harvested, and the tubers matured in January. Pumpkins will be ready to bear fruit by June this year.

These staggered harvests have brought the household the much need liquidity. Kusma devi and her husband are delighted to share the fruits of their efforts. The couple earned Rs. 42,600 from 200 sq. mt. of their land holding by growing vegetables, while their entire land holding of 2 bighas gives them with an income of Rs. 40,000.

Encouraged by these results, Kusma devi is determined to expand the area under multi-level farming.

Apart from the monetary benefit, she shares that their family consumed much more vegetables than they did earlier. Also being fresh from the farm and without any chemicals, they had fewer instances of illness. Another advantage was the savings of household expenditure in procuring vegetables from the market.

Kusma devi has been a strong advocate and promoter of multi-level farming in her village. Many women who regularly attend the farmers meeting have been to her farm and have been inspired to initiate multi-level vegetable farming on their lands.

DOHAS ENABLE FARMERS TO SECURE THEIR CROPS

Small farmers of two villages Ailaha and Chureh Kesarua in the water-scarce Chitrakoot district of Bundelkhand region are reaping benefits of Doha by cultivating rabi crops by availability of assured irrigation.

Identified as one of India's 250 most backward districts, Chitrakoot district in Uttar Pradesh is situated in the northern reaches of the Vindhyan mountains, with the highest forest cover and one of the lowest cropping intensities in UP-Bundelkhand.

With the highly undulating topography and endemic water scarcity typical of the region, Chitrakoot has been severely affected by persistent droughts and declining monsoon rainfall.

The region's low soil water holding capacity and the presence of underlying layers of hard rock make multiple rounds of irrigation necessary during the rabi season. The drying up of local wells, streams, and canals and rapidly depleting groundwater reserves in recent years has, however, meant that Chitrakoot's farmers are often unable to irrigate their rabi crops more than once per season.

Gram Panchayat Ailaha Badhaiya and its neighbouring villages in Manikpur block have long faced similar water woes. Last year, farmers in this block found an innovative solution to this problem: the Doha Model, referring to saucer-shaped water storage structures dug along streams to harvest water, accelerate groundwater recharge, and improve overall stream health.

In June 2021, BIWAL (Bundelkhand Initiatives for Water, Agriculture, and Livelihoods) partner organisation ABSSS introduced the Doha Model in Chitrakoot, constructing 11 of these sustainable, low-cost structures along the drainage lines of the Tedhi stream in Ailaha Badhaiya, Datiha stream in Sanwal Purva, and Guraula stream in Chureh Kesarua.

Every year, Tedhi, a seasonal stream in Ailaha Badhaiya, held some water during the monsoon season beginning in July, but ran completely dry after October. Residents had been unable to use this stream for irrigation or household purposes until last summer, when 4 Dohas were constructed along the streambed. The additional water capacity created by these Dohas has benefitted about 20 farmers in the village so far.

Farmers Teerath Prasad and Babulal Prasad both harvested a good crop of paddy during kharif in 1 bigha (0.62 acre) of land each, using water from the Dohas for irrigation.

Before 2021, not even a single round of irrigation had been possible during the rabi season. This time, the two farmers have used the Dohas for three rounds of irrigation for their wheat crop.

These farmers are not alone. In the short period since the Dohas were constructed, Ailaha Badhaiya and its neighbouring villages have already seen substantial benefits. Irrigation coverage in these villages has increased by up to 2.5 times—with approximately 70 acres of land now irrigated using the Dohas.

In Sanwal Purva, 10 acres of previously uncultivated fields have been sown for the first time.

Around 40 farmers with farmland in proximity to the Dohas have sown chickpea, mustard, and barley during rabi, moving away from wheat to less water-intensive crops. Encouraged by their results, neighbouring farmers also intend to modify their cropping practices.

By increasing the availability of water in a district afflicted by frequent droughts, declining rainfall, adverse soil conditions, and high rates of migration, the Doha Model has brought newfound hope for poor marginal cultivators in its villages.

Extremely pleased with their improved access to irrigation and the considerable additional income it will generate, Teerath and Babulal are confident that farmers in their region will be benefitting from these structures in for a long coming years and are moving towards climate-smart agricultural practices.

LAKSMI KUSHWAHA - MAKING HER MARK

Lakshmi Kuswaha has emerged as a true leader of her village. Not the one to bow done easily, she continued her education after getting married at a young age. The truning point in her life was her association with SRIJAN. Her journey has been transformational not just for her but her village as well. She has encouraged many women to adopt organic agriculture, she provisions preventive veterniary care, records water-level of wells and links community members to govt schemes.

Bahera village situated in Niwari district, Madhya Pradesh has an emerging leader: Lakshmi Kushwaha. Married at the age of 16, Lakshmi continued to study after moving in with her in-laws.

She lost her first child – a daughter – in infancy. Refusing to let this personal tragedy faze her, she stayed determined to educate herself, passing her class 12 exams in 2014. Soon after she gave birth to her son, her family stopped supporting her education. However, Lakshmi refused to accept this fate, and pursued a BSW diploma while also working in the fields as a labourer.

Things changed in 2021 when she heard about SRIJAN's work in the region. Lakshmi joined the organisation on the 1st of March, 2021, and has not looked back since. As part of BIWAL (Bundelkhand Initiatives for Water, Agriculture, and Livelihoods), spearheaded by SRIJAN, she received training on Climate-smart agricultural practices such as the use of organic inputs.

She was instrumental in setting up Bahera's Prakritik Krishi Kendra – where organic inputs are prepared and distributed – surveying households for the availability of cows and selecting farmers.

Inspired by her proactive engagement with SRIJAN, more women joined her. Lakshmi trained these women in organic farming practices, working tirelessly to mobilize and support them. 50 women from Bahera work with her today, attending regular meetings at the Prakritik Kendra, where they educate themselves on sustainable agricultural practices and discuss livelihood opportunities.

Apart from Bahera, Lakshmi also holds meetings with about 30 women in Namapura village. She is also trying to generate awareness among women about the various government schemes they are eligible for, to help them understand and access these entitlements.

She believes that given the right opportunities, these women can carve out their own identities and empower both themselves and their communities.

In addition to her work on organic farming, Lakshmi has also donned the role of Pashu Sakhi of her village, providing preventative animal healthcare for livestock and poultry.

Her responsibilities include carrying out surveys and spreading awareness about best practices in Bahera and neighbouring villages. Receiving training from SRIJAN, Lakshmi has so far provided deworming services for goats to 100 households in Bahera village. She aims to scale this up to all 400 households in her village.
Additionally, Lakshmi has shouldered the

responsibility for monitoring and recording monthly readings of water levels in wells, and is skilled in planning layouts and interpreting instrument readings.

At present, she is working on the construction of a dam gate in Bahera, with the cooperation of other women in the village. She has also recently been involved in distributing gas stoves to 33 especially poor women in Bahera to help them save fuel.

According to Lakshmi, her journey with SRIJAN has been nothing short of transformational. From a shy, nervous woman uncomfortable in speaking up or travelling outside her village, Lakshmi has grown into a confident, self-aware, and passionate leader. She attributes her growth – on both the personal and the professional fronts – to her work with SRIJAN.

Along with her efforts to mobilize her village community, Lakshmi is now pursuing further studies, and has enrolled herself in an MSW programme.

Commenting on her growth, Lakshmi notes: "I have learned a lot while working for SRIJAN, and I am developing my own identity in my village. People listen to me and ask me about my work. I am earning to meet my expenses and contributing to my village's development. I am not going to stop now. I will keep on marching forward."

Her next mission is to empower women in the region's villages to step up and lead from the front – by setting up enterprises owned, headed, and managed entirely by women. Lakshmi's resilience, passion, and conviction, in the face of all odds, should be an inspiration to all women and men, in Bahera and beyond.

THE POWER OF SOLAR - IRRIGATING THE LAST MILE

The pipariya cluster of villages, situated in the buffer zone of Panna Tiger reserve faced a multitude of problems due to its inaccessibility and proximate to the reserve. Erratic electricity supply meant that drinking water and irrigation access were poor. The installation of solar pumps has been a boon for the community members. Women no longer trudge long kilometeres and farmers are able to cultivate both crops.

The pipariya cluster (a group of villages) in Panna district situated amidst the buffer zone of the Panna Tiger Reserve is situated over 70 kms from Chhatarpur, the district headquarters. Also, the proximity to forest means that the area is inaccessible and remote.

While electricity has reached the village, the supply is erratic. Added to it the vulnerability to frequent damage. Repair works take over 1-2 weeks time making electricity supply extremely unreliable.

Haritika, a NGO partner in the BIWAL initiative, initiated the work in the Pipariya cluster by conducting Participatory rural appraisal. It became clear that the inconsistency in provision of irrigation to farmland due to erratic electricity supply was one of the major challenges faced by the community.

The organization had installed 2-hp solar pumps for irrigation in Chananpura village, which was in proximity to the Pipariya cluster. A group of farmers from the cluster villages were taken for a exposure visit to the solar pumps installed.

The exposure visit generated interest among the farmers to install solar pumps in their villages which led to the setting up of farmers' groups in different villages of the cluster. 4 solar pumps have already been installed in the Pipariya cluster. Part cost of the installation is borne by the community. The group of farmers formed for sharing irrigation access from the solar pump equally contribute towards the cost of the pump, a major chunk being contributed by government's subsidy under the PM-KUSUM scheme. Over 40 farmers in the cluster now have regular access to assured irrigation.

Another major issue in the area was lack of drinking water security. Lakhanguaw is a small village situated in Pipariya cluster. Surrounded by the forest of Panna tiger reserve the village is predominantly agrarian with farmers owning small livestock to support their income.

Drinking water security had emerged as the major challenge in the village raised by women in various community meetings. The main source of water supply was a borewell.

However, frequent electricity cuts, meant that the water supply was irregular, with women walking over 2 kilometers to fetch water from the nearby stream.

A solar pump was installed in the village for provisioning irrigation services also has led to regularizig the supply of drinking water. Women from Lakhanguaw now no longer trudge the long distance and have more free time on their hands.

> Solar pump seh bass khet ki pani ka hi nahi.....ab peene ke paani ka bhi suvidha mila hai
>
> .....Akhilesh, farmer, Lakhanguaw

The organization is further supporting the farmers on adoption of Climate-smart agriculture practices under the BIWAL project.

Pipariya cluster now has plantation of 3000 fruit trees which are owned and managed by individual small holders on their 1-2 acre land holdings.

Lead farmers have been identified from the villages who are not only early adapters of Climate smart agriculture practices but also disseminators of the know how among other farmers in the community.

These farmers maintain demo-plots on their farms which are used to test the results of improved varieties. Another crucial service provided by these demo-plots has been village-wise setting up of improved seed banks.

With assured access to irrigation through solar pumps, the farmers in the region now cultivate both crops on the entirety of their land holdings. This has led to an increase in annual income to the tune of INR 30,000 to 50,000. The adoption of climate-smart agriculture practices such as improved variety of seeds, organic fertilizers, horticulture plantation, etc. have also contributed to the increase in incomes.

TAPOVANS - MICRO FORESTS FOR EVERY VILLAGE

A pioneering technique enables the creation of a micro forest within a period of 3-4 years. This technique championed by Akira Miyawaki of Japan has spread world over. SRIJAN is helping restore the denuded forests of villages in the dry Bundelkhand region. The forests so created will provision ecosystem services and restore the ecological balance of villages of the region.

Miyawaki is a technique that helps build a dense native forest on a small plot of land. It was pioneered by botanist Akira Miyawaki in Japan in the 1980s and since then Mr Akira has planted 40 million trees have been planted using his method in more than 15 countries around the world.

This approach calls for 30 times denser plantation than usual and the plant growth is 10 times faster. Miyawaki forests become self-sustainable within 3-years of the plantation.

In India, Miyawaki is seeing good adoption in urban areas as this method fits in perfectly with the city landscape. As land is scarce in cities, the Miyawaki approach offers a good solution. Currently more popular in South Indian cities, the concept is slowly picking up due to the interest of municipalities and environmentalists.

SRIJAN is one of the first grassroots organizations to see the potential of Miyawaki in creating and reviving village forests. Villages today no longer boost forested hills but rather denuded and degraded slopes of land.

The rains that most farmers rely on for their Kharif crop are quickly washed down these denuded slopes, and even during a good rainfall season, most wells go dry a few months post-monsoon, as groundwater recharge is minimal.

Improving the forest and tree cover in rural areas is not only important from the broader perspective of improving overall forest cover in India but also imperative for developing climate resilience in agriculture and livestock.

The organization is promoting Miyawaki as part of a larger Climate-Smart Agriculture strategy. A micro-level approach, it accommodates both cost and time constraints of grassroots programmes.

SRIJAN initiated working on the village Miyawaki forests, coined as 'Tapovan' in August 2020 and has established 17 Tapovans since the last year in Chittrakut and Tikamgarh districts of the Bundelkhand region.

The area requirement for setting a Miyawaki forest of 1200 plants is 500 sq. mt. Sites such as temple compound, Shamshan ghat (cremation land), etc. are given priority. This is done to ensure the protection of the saplings planted. As such sites considered sacred, the community extneds the protection of the Tapovans established on such sites.

A forest management committee is set up by the community members of the village

where the Tapovan is being created to assign responsilibty of the care and protection of the forest created. One major crieteria of setting up a Miyawaki forest is planting of native species. A list of native species to be planted is prepared. The list should ideally include trees that grow to different heights; i.e herbs, shrubs, tree.

As a Miyawaki forest is to resemble a natural forest that has four levels of plants, i.e. Canopy, trees, sub-trees and shrubs, it is important to plant trees in a similar assemblage. The species to be planted as are assigned one of the four layers stated above. The plants are divided into Canopy trees, which would form the topmost layer, followed by Tree, Sub-tree and Shrub species.

As it is a dense plantation model, the plant to plant and circle to circle spacing is 70 cm as opposed to a conventional plantation which has a spacing of 6 feet for higher.

The saplings to be planted are procured from the local nursery as per the list of species finalized and as per their availability.

On a predecided day, the community gets together and undertakes the plantaton exercise. A good amount of cow dung, manure and husk is also arranged on the site by the forest management committee to ensure that the saplings get ample nutrition. The plantation is a community exercise where maximum village community participates.

The responsibility of regular monitoring, watering, weeding and manure application is shared by the villagers on rotation basis as decided upon in FMC meetings.

The initial response from the community is promising with a 97% survival rate. The trees in the Tapovans have reached a height of 10-12 feet within the first year.

KESAR'S LEARNING JOURNEY

Kesar had big dreams to attain a higher education and use her skills to better her life. Her association with SRIJAN not only led to the advancement of her knowledge but also brought development of her village.

Keshar Kushwaha lives in Kachiyakhera, a small village in Niwari district of Madhya Pradesh. Married at the tender age of 15, Keshar was a class 10 student when she had to leave her house and education for a life of drudgery. Kesar had been a good student and was keen to continue learning but the lack of money was a big constraint for her. 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, lack of skilled employment avenues in her village meant that she had to turn to agriculture.

The agricultural land owned by the family was meagre and they had cultivate crop on leased land to make some income. In recent years, due to sharp rise in input cost and market uncertainty, their income from agricultural operations had fallen greatly. Keshar started offering private tuitions to children from her village.

It was during this time that Keshar first got introduced to SRIJAN. The organization had chosen Keshar's village under the BIWAL project and had initiated working with farmers on organic agriculture practices. Keshar got interested in the concept and regularly attended meetings. She adopted organic agriculture on her own farm and was convinced of its utility. She encouraged many other women of the village to practice organic agriculture by offering free samples of organic fertilizers and bio pesticides.

Seeing her active participation in the work, Keshar was nominated as a village resource person for SRIJAN.

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

SRIJAN organized a village-level meeting in which the desilting of Chandeli talaab, an ancient tank in the village, was discussed. The desilting of the ancient tank would not only ensure water security for drinking and consumptive purposes but also allow for access to irrigation for most households of the village. Keshar played an active role in the tank desiltation work that took over a year to complete.

During the desiltation work, Keshar 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 Tank Management Committee has been formed to manage the operations and maintenance of the taalab. Keshar, as the village resource person plays a pivotal role in regularizing meetings of the TMC twice a month.

SRIJAN also helped Keshar to set up a Prakritik Krishi Kendra in her house. She was given training to concot various organic fertilizers, bio pesticides 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 established 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.

Apart from this, she was actively involved in plantation of 250 saplings, setting up of 25 kitchen gardens, provisioning cook stoves and spray machines to women.

She also regularly records the water level in the wells located within 1 km radius of Chindoli taalab.

On her experience of working with SRIJAN, Keshar shares, 'I am learning a lot in working with SRIJAN, and I, along with the women of the village, am furthering the development of our village. I wish to continue this learning journey.'

Keshar'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.

REVIVING VILLAGE DAMS

The restoration of existing water harvesting structures such as stop dams and ancient tanks holds immense potential to turn the fate of small and marginal farmers of the chronically water-stressed Bundelkhand region. The repair of the stop dam in Simariya gram panchayat of Jatara block was undertaken at the demand of the community, which is now reaping the benefits in form of good crop harvests of crop and fish.

Jatara is a block in Tikamgarh district of Bundelkhand region. Located in Madhya Pradesh, the region is historically water-stressed. The over reliance on groundwater resources to meet irrigation and drinking water requirements in the region has exacerbated the situation. Acute scarcity of water for livelihoods is being experienced in the region with most wells running dry a few months after the monsoon season.

The grim situation of water can however be solved by using the abundant infrastructure already existing in Bundelkhand. The region is home to thousands of Chandela and Bundela Tanks built eons ago by our water wise ancestors, who understood the potential of water storage in overcoming the situation of scarcity.

Apart from these tanks which are mostly in the state of disrepair, there are also many stop dams (small check dams) constructed by various government departments to temporarily store the excess water during the monsoon season so that farmers can use the water for irrigation purpose.

These water harvesting structures have gates which are fitted during the monsoon season to allow for storage of excess water flows and then removed post monsoon to allow the stream to flow normally after the monsoon flows recede.

Most of such structures, however, have missing or damaged gates, deposition of silt, encroachment by agriculture in stream-bed, etc.

When SRIJAN started its operations in the block under the BIWAL project, one of the main aims of the program was to repair and restore ancient tanks and such dysfunctional stop dams to allow for revival of the culture of water harvesting and storage among the community.

The state of stop dams in the Jatara block was accessed by looking at various parameters such as damaged or missing gates, encroachment, silt deposition, water harvesting capacity of the structure, etc.

Post the assessment of situation, the repair work is undertaken. An important consideration towards initiation of work was strong community cohesiveness and explicit willingness among community members to manage and maintain the structure post repairs.

A starting point, thus is the submission of application from the gram panchayat to the organization. This ensures active community involvement as the need has been raised by the community themselves.

One such application to repair a stop dam constructed on Pateriya stream was received by SRIJAN from Simariya gram panchayat

of Jatara block. The stop was found to be well constructed and the placement on the drainage line was also correct.

The only problem with the structure was unavailability of gates due to which the structure was unable to store water.

In initial meetings with the community after the application was received, the understanding about water sharing amongst nearby farmers was gauged.

A water user group was formed from representatives of the entire village community. The committee would be responsible for overall management and maintenance of the stop dam. It would be the responsibility of the committee to ensure that gates are fitted at the initiation of monsoon season and removed after around mid September or October.

Equitable access to water for farmers with fields in vicinity of the stop dam will also be the responsibility of the committee.

SRIJAN provided the cost towards the development of gates which was around INR 11,785 opposed to the cost of developing a new structure which is over 5-6 lakhs. The labour towards periodic installation and removal of the gates is to be contributed by community members.

The repaired stop dam benefitted 14 farmers in 2021 when the community installed the gates in the month of June. Approximately 7368 cubic meters of water was stored in 1.5 km long structure which provided irrigation to 18 acres of farm land.

The community members also benefitted from the fish harvested during the time of removal of gates in October last year.

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