

STORIES OF RESILIENCE

A close-up photograph of a young girl with dark hair, wearing a blue and white striped shirt, drinking water from a public tap. She is cupping her hands under the running water. The background is a blurred green field. A yellow diagonal band runs across the top of the image.

**Building a Sustainable Water Security System for
Livelihood & Economic Enhancement of farmers
in 12 villages of Koriya, Chhattisgarh**

CASE STORIES BOOKLET

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From Scarcity to Abundance: A Success Story of Biofloc Fish Farming in Pipardand

Pipardand is a Village in Korea district, Chhattisgarh that struggles with water scarcity and limited cultivable land. The Gond Tribe, along with other small tribes and OBCs, relied on rain-fed agriculture for income, primarily from the cultivation of Arhar and Kulthi crops during the Kharif season.

Despite their efforts, the average annual income from agriculture and non-timber forest produce was a mere Rs. 40,000/-.

Most of the farmers owned 3-5 acres of land, which was, however, fallow and uncultivable due to lack of water availability and gradual degradation of land. They usually went for cultivation during the Kharif season and remained unemployed for the rest of the year due to lack of sources of income and livelihood opportunities.

The villagers in the region lacked basic facilities to practice sustainable development activities and had minimum knowledge of modern agriculture and livelihood practices. Promotion of sustainable livelihoods thus became crucial in order to ensure self-reliance of the village community and provide an alternative income source.

One viable option was fish farming by employing Biofloc-a modern fish farming method that significantly reduces input and installation costs (by approximately 30%) while increasing efficiency for farmers by saving a lot of efforts and time.

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Organic waste in the tanks is treated into fish feed using bacteria and carbon sources such as molasses. This intervention offers high production output, improved household income generation opportunities, less maintenance cost and high return of investments for farmers.

The farmers were given the opportunity to visit Ambikapur on exposure visits to know more about the Biofloc method and its benefits. Later on, the project experts provided technical training to farmers interested to adopt Biofloc fish farming as an alternative livelihood.

Two groups were formed by Village Development Committee (VDC) and further bifurcated based on household income. These groups included marginalised farmers belonging to poorest of the poor groups who would typically migrate to the cities in search of daily wage labour work.

The community-level implementation of Biofloc fish farming saw farmers utilising barren land and a piped water supply to install tanks and raise fish. Five farmers in the village each installed a tank, starting with 1200 fish seeds, and within 8 months, they were able to produce 15 quintals (1500 kgs) of fish. These farmers then sold their fish at a rate of Rs. 120 per kg, earning a total annual revenue of Rs. 1,80,000/-.

The Biofloc tanks can easily be installed in the backyard also as they do not need much space. The hybrid variety of fish seeds used by the farmers yields more than the native fish variety. While the activity is presently being promoted at the community level, its expansion will also be taken up at the individual level. The 'Building a Sustainable Water Security System for Livelihood and Economic Enhancement



Farmers in Pipardand village have seen a significant increase in their annual income, with an average increase of Rs. 15,000

of Farmers' project by HDFC Bank Parivartan and WOTR has provided farmers with all necessary materials and expert training, as well as ongoing support throughout the implementation process to ensure successful and sustainable fish farming using the Biofloc method. The farmers in Pipardand village have seen a significant increase in their annual income, with an average increase of Rs. 15,000, thanks to the implementation of fish farming using the Biofloc method as an alternative livelihood activity.



The Biofloc tanks can easily be installed in the backyard as they do not need much space

A DETAILED BREAKDOWN OF INPUTS AND MATERIALS USED IN THE PROJECT

Sr. No.	Particulars	Quantity
1	Dimension of 1 Bioflock Structure	4*4*1.2
2	Total Volume of water in one unit	12000 Litres
3	Total Fish in one Unit	1200
4	Water availability for one fish	10-12 Litres
5	Oxygen	24 hours
6	Feed available of body mass	2 percentage
7	Probiotic Powder (in one time one Tank)	250 grams
8	Jaggery	0.5 grams
9	Salt (1 litre)	1 ram
10	Chuna (Caco3) in 1 Litre	0.5 grams
11	PH	6-7.5
12	TDS	300-350
13	Thickness of Tarpaulin	750 GSM
14	Thickness of Mess	4 mm



Check-Dam Brings Relief to Chhattisgarh Farmer Struggling with Irrigation Challenges

Udaybhan Singh, a 48-year-old resident of Jhaliyadand village, has a family of six, including his mother Shyamanti Bai (75 years), wife Kausalya (30 years), and sons Deepak (27 years), Dinesh (14 years), and Kuldeep (8 years). As one of two breadwinners, along with his elder son Deepak, Udaybhan earns a living through agriculture on his six acres of land. During the Kharif season, he grows paddy and relied mostly on rainfall for irrigation.

In the Rabi season, he grows wheat and flaxseed in a limited area, dependent on water availability. This agricultural endeavour earlier generated an annual income of just 35,000 Rupees, insufficient to support the family of five adults and one child. In addition to the farmland, Udaybhan also owns five cows, three goats, and a hen.

The cultivation of paddy during the Kharif season is plagued by inconsistent rainfall and inadequate irrigation for Udaybhan and his family. This often led to crop loss, causing significant financial strain for the family. The Rabi season offered little relief as the land remained fallow during this time. A secondary perennial drainage line runs beside this patch, just two meters below the land's surface. In times of heavy rainfall, the increased water flow in the stream rose above the ground level, eroding the land and causing further crop loss. This exacerbated the already challenging circumstances faced by Udaybhan and his family in securing a sustainable income through agriculture.

In July 2021, HDFC Bank Parivartan with WOTR as the implementing partner launched the, "Building a Sustainable Water Security System for Livelihood and Economic Enhancement of Farmers in 12 Villages of Koriya District, Chhattisgarh" project. The project encompasses twelve villages, including Jhaliyadand, and aims to improve the income of vulnerable and marginal communities through sustainable livelihood practices, climate-resilient agriculture, watershed activities, and capacity building. During a regular meeting, the village

development committee of Jhaliyadand brought attention to the irrigation challenges faced by Udaybhan and other small farmer and requested the construction of a check-dam. A technical survey was conducted by the project team and the community, and the site for the dam was finalised. Several meetings were held to plan the construction, including discussions about contribution details and other preparations. Despite the challenges posed by the rainy and seepage-prone soil, the construction work began in February 2022 and was completed within the specified time frame.

Following the completion of the project, approximately 5 hectares of land were directly irrigated. Last year, the monsoon arrived late, causing seedlings of paddy to dry up in some parts of the gram panchayat due to deficient rainfall. However, in the area near Check-Dam the seedlings were well-irrigated, and sowing was carried out in July, which is an ideal time for paddy cultivation. Prior to the construction of the check-dam, the beneficiaries had never grown a winter crop (Rabi), but with the successful



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For Udaybhan, the check-dam built with the support of the project has greatly improved the irrigation of his land

irrigation provided by the dam, they were able to cultivate Rabi crops for the first time.

For Udaybhan, the check-dam built with the support of the project has greatly improved the irrigation of his land. Previously, he would only harvest 2000 Kg of Paddy during the rainy season, but this year, he was able to yield 2500 Kg thanks to the consistent irrigation.

For the first time, he also planted a winter crop and was able to harvest 1500 Kg of wheat.

Soil deposits in the upstream can decrease the dam's storage capacity, and the high rainfall in the area puts pressure on the side embankments. To address this, the local land owners and frequent users collaborate to dress the soil of the embankments and clear the accumulated soil. Additionally, the check-dam has also provided unanticipated benefits.

For instance, the beneficiaries have extracted 100 tractor trips of sand from the upstream, and the structure has also become a source of locally sold fish.



From Struggle to Sustainability: Shivmangal's Journey with Biogas

Shivmangal Singh, a 38-year-old resident of Mudijhariya village, struggled to provide for his family of six despite his best efforts. He and his eldest son were the only earning members in the family. Shivmangal owned 1.4 acres of land where he grew crops like paddy, pigeon pea, maize, black gram, chilly, tomato, potato, and other seasonal vegetables.

Agriculture was the major source of income for the family, but due to the limited landholding, it was difficult to make ends meet. To supplement his income, Shivmangal also worked as a daily wage labourer under MGNREGA or in other's farms. Of late, he had also started a small general store which brought in an income of around Rs 5000 each month.

Despite these efforts, feeding his family of six was challenging, especially with the added expenses of resources required for igniting the fuel wood for cooking, which cost around Rs. 40 per litre for 4-5 litres of kerosene oil per month. To collect fuel wood, Shivmangal along with

other fellow villagers had to walk up to 5 Km to reach the nearest forest named Salhanwa on a weekly basis, bringing back 25-30 Kg for the whole week.

Apart from these expenses, Shivmangal also had to contend with his own health issues that came with aging, such as joint pain, headache, and other related issues. He was also a victim of the deadly outbreak of Covid-19. Despite all the challenges, Shivmangal did his best to provide for his family, but it was a constant struggle to make ends meet.

In October 2019, HDFC Bank's Parivartan and WOTR partnered to launch a project under the Holistic Rural Development Programme (HRDP) aimed at improving the livelihoods and economic prospects of farmers in 12 villages of Koriya District, Chhattisgarh. The project, titled "Building a Sustainable Water Security System for Livelihood and Economic Enhancement of Farmers," received financial support from HDFC Bank with WOTR as the implementing partner.

The project's objectives included enhancing the income of vulnerable and marginal individuals by supporting them through sustainable livelihood development, climate-resilient agriculture, watershed management, and capacity building activities. The project aimed to improve the economic stability of farmers in the region by addressing the challenges of water security and promoting sustainable agricultural practices.

Shivmangal discovered the project during the formation of the Village Development Committee (VDC) in Mudijhariya, which took place in October 2019. Through attending regular meetings, he also learned about the biogas system promoted under the project and its numerous benefits, including reducing the burden of collecting fuel wood and saving time for potential income-generating activities.

Biogas is primarily composed of methane gas produced from the decomposition of farm waste in the form of slurry. Compared to burning 1 kilogram of fuel wood, which generates 1.65-1.80





Shivmangal along with other fellow villagers had to walk up to 5 Km to reach the nearest forest named Salhanwa on a weekly basis

kilograms of CO₂, biogas emits 81-251 grams of CO₂ per kilowatt-hour, making it a more environmentally friendly option. Due to his health concerns, Shivmangal proposed to receive support for a biogas system which he did and was provided with all necessary materials and training to operate and maintain a biogas system.

Shivmangal Singh is thrilled to share his story of how the biogas system has since greatly reduced his workload drudgery and the physical pain associated with it.

He now only needs to collect fuel wood twice a month, as most of his cooking is done using biogas. The only exception is food that requires high-flame cooking, which still needs to be cooked using traditional methods. In addition to reducing the workload, the use of kerosene oil has also been minimized.

With women particularly being at a high risk of developing pulmonary diseases such as asthma and cataract due to exposure to fuel-wood combustion, with the use of biogas, these risks have been significantly reduced.



The biogas system has greatly reduced Shivmangal's workload and the physical pain associated with it



Recently, he had also started a small general store which brought in an income of around Rs 5000 each month



Empowering Rural Youth through Technological Inclusion

'The future of India lies in its villages'. These wise words by Mahatma Gandhi point towards the crucial role that rural education institutions play in educating and skilling our rural youth. As a majority of India's population lives in rural areas, it is essential that these institutions evolve and keep pace with the modernized education system in order to achieve the dream of a skilled India. This not only empowers children to understand policies, rights and laws from a young age, but also helps to reduce migration from rural areas to cities in search of employment and creates new opportunities for them.

Sara is a revenue village in Baikunthpur block of, Koriya district in Chhattisgarh with a population of 1098 people, of which 555 are male and 543 are female. The total geographical area of the village is 378.18 hectares, and the literacy rate of the village is 63.02%, with 74.23% of males and 51.57% of females being literate. Like many other rural education institutions in India, Sara's government school had been struggling to keep up with its urban counterparts due to inadequate infrastructure, both hard and soft, digital illiteracy, inadequate skills, and so on.

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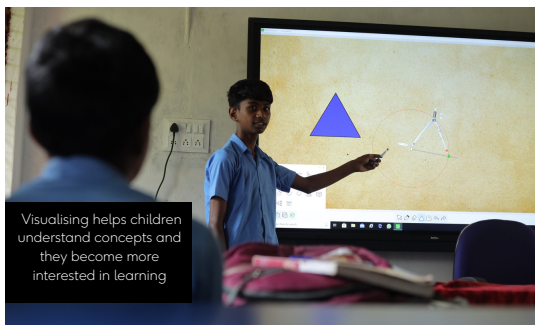
HDFC Bank Parivartan and WOTR's partnership through the 'Building a Sustainable Water Security System for Livelihood and Economic Enhancement of Farmers' project understood that by emphasising rural education through technological inclusion, one could build future-readiness in students, thereby widening their career choices and livelihood opportunities by preparing them to handle rapidly evolving market and skill needs. Digital education has often been considered a viable solution for rural India to address the existing gaps in imparting education. It is believed that digital education can curb the

issues related to quality education delivery, the inadequacy of teachers in rural schools, high rate of dropouts, insufficiency of innovative teaching-learning methods and lack of standard learning material. In an effort to address these issues and provide students with a wider range of career and livelihood opportunities, a start was made with the middle school of Sara Government School transitioning from traditional chalkboard teaching to a more digital and interactive method. The decision was made after a thorough selection process and consultations with all stakeholders, including teaching faculty, the Principal/ Headmaster, the School Management Committee, and parents.

In February 2022, a fully equipped state of the art Smart Class was installed, featuring a 65-inch interactive panel, CPU, benches, white board, carpet, markers, a teacher's table and a chair, and a fresh renovation of the classroom. To ensure proper usage and understanding of the new technology, a training was organized for all users by an expert trainer. The training covered setup instructions, information on the apps included details on the software installed, and other technical aspects. A hands-on session



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Visualising helps children understand concepts and they become more interested in learning



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was also provided for better understanding. The setup also included an app called Teach Infinity, which featured soft copies of books authorised under the Chhattisgarh Board of Secondary Education for Science and Mathematics. The app also had a feature that allows users to save presentations in PPT format for later reference or for discussing doubts.

Expressing her gratitude towards HDFC Bank Parivartan and WOTR, Nitu Khushwaha, a middle school teacher said that children love screens, whether it be a TV or a laptop. Visualising something helps them understand it and in turn, they become more interested in learning, with far higher retention. The use of the Smart Class has also incentivised students to attend school regularly. When asked about challenges in operating

the Smart Class, Nitu Khushwaha states that it did not seem challenging or intimidating because the children had already become mobile-friendly due to the COVID-19 situation. There were only a few children who did not have mobile handsets, but they were quickly familiarised with the Smart Class.

The children who were technically savvy helped the others, making it an enjoyable experience rather than a challenging one. Regarding teaching, she mentions that the Smart Class has given her an opportunity to deliver information in a more visual way, such as showing the human anatomy or the solar system.

10 such Smart Classes will be installed in the villages covered under the 'Building a Sustainable Water Security System for Livelihood and Economic Enhancement of Farmers' project.



A Solar-Powered Solution for Clean Drinking Water

Gadbadi is a revenue village located in the Baikunthpur block of Koriya district in Chhattisgarh. It has a total population of 1637, comprising of 803 males and 834 females. The literacy rate in the village is 61.51%, with 68.12% of the males and 55.16% of the females being literate. Gadbadi is situated 19km away from Baikunthpur, which serves as the block headquarters. According to statistics from 2009, Gadbadi is also a gram panchayat.

Parwati Singh, a 40-year-old resident of the picturesque village of Matijhariya, belongs to the ST 'Gond' community. Along with her husband Ramavtar, 50, and her children Dharmaraj, 22, Neeta, 18, and Durgesh, 10, she resides in a small home surrounded by fields of crops. For years, Parwati and her family have been practicing farming, which has been the major source of annual household income for them apart from money earned through daily wage labor employment.

Parwati's family owns 5 acres of land, where they cultivate kharif crops. However, for the rest of the year, they are dependent on finding labour work in other's farms. Parwati maintains a kitchen garden in the backyard for her family's consumption and nutrition. As a homemaker, she is also responsible for all household work - cooking, cleaning, maintaining the kitchen garden, and collecting fuel wood from nearby forests on a daily basis. Despite the aging factor and general health issues, she manages to do it all with the help of her only daughter Neeta.

But despite all the hard work, Parwati and her family were faced with crippling water scarcity during peak summers when all the nearby water sources dried up. The problem was compounded by the poor quality of the water from the nearby hand-pump, the only source of drinking water for her family. The rusty water not only posed a health hazard but also affected the productivity of their kitchen garden, putting a question mark on their nutrition needs. In such a grim situation, Parwati

had to walk up to 2 km to a perennial dug-well in the village for fulfilling all water requirements, adding to her already heavy workload.

In July 2021, HDFC Bank Parivartan, together with WOTR launched a bold and ambitious project: the 3-year HRDP (Holistic Rural Development Program) titled 'Building a Sustainable Water Security System for Livelihood and Economic Enhancement of farmers in 12 villages of Koriya District, Chhattisgarh.' This project is aimed at transforming the lives of poor and marginalized farmers by securing their access to water, food, and livelihoods.

Gadbadi, one of the first project villages, has already seen significant progress in the past year. Thanks to the diligent work of the Wasundhara Sewak/Sewika guidelines and regular meetings with VDC Secretary Nanhu Singh, the community was made aware of the project's goals and the support it could provide. Recognising the dire need for a perennial potable water source in their hamlet, Nanhu and Parwati proposed the installation of a Solar Powered Clean Drinking Water setup at the hamlet.



Parwati and her family were faced with crippling water scarcity during peak summers when all the nearby water sources dried up

After careful consideration and following the criteria for selection, their proposal was accepted, and in March 2022, the setup was installed.

The 2000L Water Tank with 3M Galvanized structure, a galvanized solar panel structure and the iron pipe, replaced with HDPE (High Density Polyethylene) pipe to prevent rust problems, now provide safe and clean drinking water to 12-13 households and around 75 individuals in that particular hamlet.

Not only does this intervention provide clean drinking water throughout the year, but it also reduces the drudgery and time spent pumping the hand-pump manually. Women, in particular, now have more time to engage in other agricultural activities and focus on their Kitchen Gardens.

This project is truly empowering the community and bringing about real, lasting change.





Transforming Agriculture through a Community Well

Indrapal Singh Masharam is a 60-year-old resident of Chilka village, located at a distance of 17kilometres from the Baikunthpur block headquarters. He heads a small family consisting of his wife Sumitra Singh, 55 years old, his son Sugriv Singh, 24 years old, and his daughter Kusum Singh, 22 years old. Kusum is currently pursuing a BSc degree while Sugriv, who has only completed Intermediate level, supplements the family's income by working as a tailor during festive seasons, which is not a reliable source of income.

The primary source of income for Indrapal is agriculture. He used to work as a carpenter in his younger days, but due to his advanced age, he is no longer able to continue in that profession. He owns 6 acres of land, but due to lack of water he could only take up cultivation in 3 acres. During the Kharif season, he grows paddy and pigeon pea, and in the Rabi season, he grows vegetables for self-consumption, depending on the availability of water. Despite this, Indrapal struggled to earn a decent income due to the severe lack of water for irrigation in the area.



Water Budget displayed outside the Sarpanch Office in Adha ensures ownership and better management of water resources

Chilka village, situated atop a hill, faces a shortage of water for both agricultural and domestic purposes. While agriculture is the major occupation in the village, it is largely rain-fed due to the lack of irrigation sources. The impact of climate change on agriculture has resulted in major losses for the farmers.

In October 2019, HDFC Bank Parivartan and WOTR partnered to launch the "Natural Resource Management through Watershed Development of 8 villages in Korea District of Chhattisgarh" project. The project aims to enhance the income of vulnerable and marginal communities by supporting them through sustainable livelihood, climate-resilient agriculture, watershed activities, and capacity building. The project covers 8 revenue villages, including Chilka.

Indrapal became aware of the project through regular village development committee (VDC) meetings. Indrapal rallied his neighbours - Jawahar Singh, Karan Singh, Ramkumar Singh, Jaykaran Singh, and Indrapal Singh - and proposed to the VDC



He owns 6 acres of land, but due to lack of water he could only take up cultivation in 3 acres

to construct a community well on his farmland. The VDC accepted the proposal and the group contributed Rs. 30,000 towards the digging work. With the project funding the materials and masonry, the construction of an 18 ft. diameter wide community well was completed in May 2021.

Indrapal has seen a significant change since the construction of a community well on his farmland. The well has enabled him to fully utilise 4 acres of land, allowing him to grow a variety of crops such as paddy, pigeon pea, and barai in the Kharif season, and wheat and seasonal vegetables in the Rabi season.

Not only has this increased his own yield, but it has also benefited 8-10 nearby households who now have access to the well's water for irrigation on an additional 12-13 acres of land.

The well has not only fulfilled Indrapal's irrigation needs but also provided enough water for daily domestic use. The access to ample water has not only improved Indrapal's own agricultural productivity but has also elevated his status in the community as a progressive and generous farmer. With the well providing for all his irrigation needs and domestic water use, Indrapal has set a short-term goal of further developing his land and maintaining the well.



The access to ample water has also elevated Indrapal's status in the community as a progressive and generous farmer





Rejuvenating Communities & Ecosystems

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