

## TRIBAL TALES OF CLIMATE RESILIENCE

# SAFEGUARDING LIVELIHOODS



This publication has been brought out under the Project **“Climate Change Adaptation Measures for Promotion of Livelihood of Rural Tribal Farmers Through Agriculture and Allied Sector Interventions in Chhattisgarh”**. The project has been implemented by AFPRO with financial support of EdelGive Foundation.



Action for Food Production (AFPRO) is a socio-technical development organization that provides socio-technical support in the areas of Agriculture, Food Security, Livelihoods, Water, Sanitation, Watershed Management, Natural Resource Management and Climate Change. It reaches out to the poor and marginalized communities throughout India, particularly the small and marginal farmers, landless and tribal segments of Indian society. AFPRO has been working in 65 districts across 19 states in India, with focus on 7 aspirational districts.



EdelGive Foundation is a grant-making organization, helping build and expand philanthropy in India by funding and supporting the growth of high-caliber, small to mid-sized NGOs committed to empowering vulnerable children, women and communities. This approach has enabled the foundation to be a go-to partner of choice for Indian and foreign funders wanting to engage with the Indian development ecosystem. Over the last 13 years, EdelGive has supported over 150 organizations across 111 districts in 14 states of India, influencing commitments of over INR 4.61 billion in philanthropy.

# Message

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**DR. JACOB JOHN**

**Executive Director, AFPRO**

We are pleased to share the publication titled ***“Tribal Tales of Climate resilience: Safeguarding livelihoods”*** from Eastern region of AFPRO. Chhattisgarh is primarily an agrarian state, with a large population involved in agriculture. More than 70% of its farmers are small or marginal. Small landholdings, traditional methods of cultivation and limited irrigation facilities have resulted in low crop productivity and subsistence agriculture in the region. Climate crisis like extreme weather conditions and disasters have exacerbated low crop productivity.

This project has rightly been conceptualized in Gurur block of Balod district to address these challenges by capacity building of local community against adverse climatic impact and to augment their income. AFPRO has been successful in addressing the situation holistically through water efficient practices, water recharging and soil improvement, adoption of better and climate resilient agricultural practices for increased crop productivity and reduced input cost, institutional building as well as economic diversification.

This publication showcases best practices, challenges and learnings of the project and provides inspiration to the project team. I hope that this publication will be a useful document on climate resilient livelihoods.

I express my gratitude towards EdelGive Foundation for their partnership in the project and contributing towards this publication.



# Foreword

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## DEEPA GOPALAKRISHNAN

Head – Sandbox Grants,  
EdelGive Foundation

I am very delighted to share that EdelGive Foundation with implementation partner AFPRO is releasing publication titled ***“Tribal Tales of Climate resilience: Safeguarding livelihoods”*** under the project called **‘Climate Change Adaptation Measures for Promotion of Livelihood of Rural Tribal farmers Through Agriculture and Allied Sector Interventions in Chhattisgarh’**.

The direct impact of climate change on farmers, brought about by unpredictable weather patterns and calamities, has exacerbated the challenges of low crop productivity, food insecurity and limited livelihood opportunities. In response to these pressing issues, the program has provided a beacon of hope to the tribal farmers in Balod district since 2016. In the initial phase, efforts were focused on managing surface water resources, leading to the enhancement of livelihoods through interventions in agriculture. Witnessing the transformative effects on farmers' lives, EdelGive embarked on a second phase, expanding its reach from four to eleven villages. This expansion saw the extension of interventions beyond agriculture to encompass a range of livelihood-enhancing activities.

This publication of stories encapsulates the lessons, insights, and accomplishments of the program through its seven years of execution. I extend my heartfelt gratitude to the entire team of AFPRO for their clear vision and conviction to influence the lives of the most needy and vulnerable sections of the society. I wish them success in their continued journey and unwavering dedication to bring about community resilience through climate action.



# From the Manager's Desk

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## PARINA EINJEN

Regional Manager–  
Eastern Region, AFPRO

Agriculture is a fundamental component of human civilization and a means of subsistence. Particularly for tribal farmers, agriculture is a way of life that not only provides food and nutrition but also promotes environmental sustainability, economic development, and cultural preservation. Because farming is a traditional practice for tribal farmers, they mostly rely on rainfall as their source of irrigation water, which makes farming susceptible to the effects of climate change. The program ‘Climate Change Adaptation Measures for Promotion of Livelihood of Rural Tribal Farmers through Agriculture and Allied Sector Interventions’ has built the resilience of the tribal farmers of selected 11 villages of Balod district of Chhattisgarh by augmenting water resources, inculcating sustainable agriculture practices, and developing income-generating skills.

The publication **“Tribal Tales of Climate resilience: Safeguarding livelihoods”** stands as a testament to the both the initial and ongoing phases of the project's timeline. During the course of its implementation phases, the initiative has increased capacity of farmers to adapt to climate change in various ways. Through these stories, readers will learn how the tribal farming community -- women in particular -- has undergone a substantial transformation along the way.

I would like to express my gratitude to the CSR team of EdelGive Foundation for their support. Ms. Sukhreet Bajwa and Ms. Sonia Pereira always committed themselves to the project goals, and supported AFPRO to resolve the challenges that arise during implementation. Their inclusive approach and solution-focused guidance involving all stakeholders are highly commendable.

I want to sincerely thank the project field team, especially Mr. Alok Dalabehera and Mr. Hemlal Sahu, as well as Mr. Santosh Gunjal and Mr. Ashish Jain from the Raipur team, for their dedicated efforts to implement the project. I also extend my heartfelt appreciation to Dr. Jacob John, Executive Director of AFPRO, and Ms. Geeta Deswal for their unwavering support in streamlining the process, making the publication of “Tribal Tales of Climate resilience: Safeguarding livelihoods” possible.

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# Project Brief

## Background

Chhattisgarh, primarily an agrarian rural state, comprises 80% rural population (around 5.1 million people in 2011). According to the Government of India Census, 2011, at least 34% are Scheduled Tribes, 12% are Scheduled Caste and over 50% belong to official list of OBC. Chhattisgarh has abundant natural resources, often called as “Poor People’s Rich Land”. Proper and planned utilization of the untapped resources can change the present scenario of this state.

Though more than 70% of its cultivators belong to the small and marginal farmer categories, agriculture is counted as the chief economic occupation of the state, with paddy as the principal crop. Most of the farmers are still practicing the traditional methods of cultivation, resulting in low growth rates and productivity. Moreover, with limited irrigation availability, the productivity of paddy as well as other crops is also low. Hence, farmers are unable to obtain the desired economic benefits from agriculture, which is thus limited to subsistence.

## Project Rationale

Water-saving techniques, water recharge methods, soil improvements, and improved crop yields are required to help communities fight the effects of climate change and boost their incomes. It is crucial to approach the problem holistically by implementing more efficient agricultural methods that require less input. Economic diversification and an institutional structure are other two pillars of the project.

We have embarked on an ambitious second phase of the project, building on the learnings of the first phase, which started in January 2016. As of now, the second phase is well underway and continues





to make significant strides towards its objectives. The tribal farming community has undergone a transformative journey towards climate resilient farming. They have not only acquired valuable skills and knowledge but have also showcased their newfound ability to proactively pursue enhanced farming practices. As a result, there has been a commendable uplift in the socio-economic conditions of farmers.

To cater to these needs, the project “Climate Change Adaptation Measures for Promotion of Livelihood of Rural Tribal Farmers Through Agriculture and Allied Sector Interventions in Chhattisgarh” had been initiated in 2020 by AFPRO with financial support of EdelGive Foundation. This 4-year project aims to benefit more than four thousand people across the predominantly 11 tribal villages in Gurur block of Balod district in Chhattisgarh.

## Project Objectives

- ▶ Enhance irrigation facilities through water conservation measures and increase secure irrigation for optimizing yield and income.
- ▶ Enhance crop productivity by 25–30% and farmers’ income by 15-20% through climate-smart agricultural practices, improved farming techniques and their allied interventions.
- ▶ Build the capacities of the community through training and hand-holding support under climate-smart agricultural practices for better adaptation to climate change.
- ▶ To form, nurture, and promote “Producer Groups” for mushrooms and its byproducts, vegetables, fish, etc. through the establishment of market linkages.



## Major Impacts

Up till now, the program has resulted in a number of noteworthy tangible and intangible outcomes, some of which are listed below:

- ▶ With the construction and renovation of 50 water harvesting structures, the additional capacity for water storage has increased to approximately 116695 CuM.

- ▶ About 1850 acres of land were brought under secured irrigation, and about 9.5 acres of land, comprising 16 farmers, have started Rabi cultivation through these water harvesting structures.
- ▶ A 33% boost in productivity was achieved by using SRI paddy cultivation on around 250 acres of land.
- ▶ During the Rabi season, 84 farmers, covering 74 acres of land, began growing vegetables, significantly increasing the farmers' income.
- ▶ Women developed their entrepreneurial skills and began income-generating ventures such as mushroom cultivation, fish farming, pickle and papad making, and so on.



## Key Learnings

- ▶ **Water at the core of agriculture:** In the context of climate change, it is important to understand and address the core challenges of water in agriculture through technology support and awareness of appropriate water management practices.





▶ **Livelihood diversification:** It's essential to minimize risks and cope with any external disasters or calamities, especially for those who are excluded and marginalized. In tribal areas, household income can be increased through different livelihood diversifications, such as fishing, vegetable cultivation, and mushroom cultivation, using their traditional knowledge and abilities in conjunction with market demand.



▶ **Cultivating Women's Leadership:** Livelihood interventions through women's group provide them with an opportunity for personal growth, earn a livelihood, and contribute to their community.



▶ **Gaining Community Trust:** The place being a tribal-dominated remote area, it is essential first to gain community trust. Before imposing a project approach, it is essential to address community needs first to gain the trust.





# WATER RESOURCE MANAGEMENT

## Increasing Drought Resilience Through Check Dam Repair

### Background

In order to provide access to irrigation, the Government Irrigation Department constructed a stop dam in 1962 in the Chauraha drainage line of the river Tandula in the area. Tengna Barpara village is located nearby to this dam. About half (400 acres) of the 758 acres of agricultural land in the community, owned by 200 farmers, are entirely dependent on this stop dam for irrigation and household requirements. However, the dam was significantly damaged in 1998, including structural damage at the upstream foundation and excessive siltation within the dam. This had led to leakages, and the dam could not hold water for more than 15–20 days, causing shortage of irrigation and domestic water for the dependent farmers.

### Project Interventions

To cater to the water requirements of the village, AFPRO and EdelGive Foundation took up the renovation work of the stop dam from 2017 to 2019 with total budget of Rs. 0.7 million. Series of works were taken up after multiple consultations with community as well as detailed technical surveys.



## These include:

- ▶ De-siltation from upper side of the dam
- ▶ Repair of broken sluice gates
- ▶ Cleaning of 1500-meter earthen channel providing water from dam to fields
- ▶ Construction of one lined channel for diversion of water from main channel to fields for increasing land under irrigation.
- ▶ Repairs of superstructure by construction of additional RCC (Reinforced Cement Concrete) wall.
- ▶ Repair, sealing of crack and holes as well as plastering for increased structural safety.
- ▶ Stone pitching inside the earthen bund for increased structural strength.



## The Change and Impact

Since 2019-2021, low rainfall conditions had led to drought conditions and majority of borewells had dried up. During this period, renovated stop dam became the lifeline for irrigation as well as domestic water needs of Tengna Barpara village. Presently, the stop dam is essential in supplying critical irrigation to the Kharif crop during its lean season. The stop dam can supply the necessary one or two irrigations for paddy production on around 400 acres of land, consisting of 200 farmers, when there is moderate to good rainfall. The average productivity of paddy has increased to 3-5 quintals per acre due to increased availability of irrigation water, creating an additional income of Rs. 5,000–8,000 on an

average for each farmer. Further, due to increased use of surface water, dependence on ground water has reduced, resulting in improved ground water table in borewells, benefiting Rabi cultivation. This has led to rise of Rabi cultivation in 4 acres of land by 6-7 farmers. Primarily focusing on vegetable cultivation, the local farmers have experienced a notable surge in their income by a margin of Rs. 5,000-6,000 per farmer. This positive shift in their financial status has benefitted around 55-60 families residing in the Nahanda and Tengna Barpara villages, where improved access to domestic water has become a valuable outcome of this agricultural endeavor.



## IMPACT AT A GLANCE



**Critical irrigation during the lean period for the Kharif crop**



**Increased paddy productivity of 3-5 quintals/acre**



**Increased production led to an additional income of about 37%**



**Reduced dependence on groundwater led to an increase in groundwater table**



**Increased Rabi cultivation in 4 acres land**



**Check dam is our lifeline, and its repair work has saved our village from facing drought conditions.**

– Village Community, Tengna Barpara village

### Tengna Barpara

Panchayat has given the stop dam for fish rearing to a farmer under lease, earning Rs. 6,000-7,000 annually. The intervention thus has a significant impact on the quality of life of farmers residing around the Check Dam.



# Farm Pond – An Agent of Rural Transformation

## Background

Harik Bai Mandavi, a tribal farmer, is a resident of Baddhum village. The family of four owns 5 acres of land. Of this, only 2.7 acres are cultivable, and the rest remain barren. Prior to project interventions, she cultivated paddy through the standard broadcasting method with traditional paddy seeds, fetching an average of 12–14 quintals annually. With no irrigation source, paddy cultivation was rainfed. To augment family income, her family also used to work as daily wage laborers in the MNREGA and sell forest products like Mahua and Tendu leaves.

## Project Interventions

Harik Bai attended various project meetings and showed interest in the construction of a farm pond for assured critical irrigation and to augment her income from farming. With technical and financial support from the project, she was able to construct a farm pond in 2019. The total project cost was Rs. 74,000, of which she contributed Rs. 4,000 in terms of labor.



## The Change

- ▶ Building a farm pond has been a key factor in increasing income.
- ▶ She began cultivating vegetables (okra, onion, and tomato) on 0.50 acres of land in 2020 with technical assistance and handholding support from the project. By selling their produce at the Badbhum weekly market, they made about Rs. 8,000/-.
- ▶ On two acres of land, she began cultivating SRI paddy for the first time in 2021.
- ▶ She now has assurance of critical irrigation for Paddy and provides 1-2 irrigations. She is now able to fetch about 20–22 quintals per acre.
- ▶ Last year, she also initiated her first venture into fish farming by putting 5 kg of fish seeds (Rohu, Katla, and Miragal) in the pond.
- ▶ As a result, she has been able to increase her net household income by up to Rs. 30,000 annually.



## Learnings

Together, the enhanced management of water resources and scientific farming methods have the potential to transform the tribal rural scenario from merely subsistence farming to a profitable livelihood.



# Transformation of Barren Land

## Background

Sarban Kumar Raute is a tribal farmer from Kaparmeta village with 14 family members. Though he owns seven acres of land, he can barely make his two ends meet. Due to lack of irrigation infrastructure, they were able to take the kharif crop only on 5 acres with a modest production. They cultivated vegetables occasionally on half-acre during Rabi season. Thus, with about 2 acres of barren land and only a single cropping system, the family's agriculture income was limited.

## Project Interventions

- ▶ The initiative of check dam repair work near his farmland under the project marked the beginning of his transition. Approximately 3200 cubic metres of storage capacity of the check dam enabled securing irrigation for over 30 acres, benefitting 30 farmers during the Kharif season and roughly 6-7 acres during the Rabi season.
- ▶ Seizing the chance, Sarban Kumar purchased a diesel pump and used it to irrigate his two acres of barren land.



- ▶ After that, taking the initiative, Sarban Kumar learned the Systematic Rice Intensification (SRI) method of paddy cultivation and put it into practice on a land area of approximately two acres. Support for the scientific package of practices was provided by the team.
- ▶ Additionally, he again took initiative and learned the use of a single-line trellis for vegetable cultivation and implemented it on a half-acre plot of land in Kharif season for growing bitter gourd, Okra, etc. He got support for bamboo, staking weirs, and certified seeds under the project. He even learned seed production for his own use and saved seed cost.





## The Change and Impact

Season		Crop Type	Land cultivated (Acre)	Method of cultivation	Input cost per acre	Avg. Productivity per acre	Net income from crop
Kharif	Pre project	Paddy	5	Traditional broadcasting	16,000	19 quintals	Rs. 91,000
	Post project	Paddy	4	Traditional broadcasting	16,000	19 quintals	Rs. 72,800
		Paddy	2	SRI	10,000	25 quintals	Rs. 70,000
Rabi	Pre project	Vegetables	0.50	Traditional Method	40,000	851 Kg	Rs. 40,000
	Post project	Vegetables	2.50	Line Sowing, Mixed farming, Single Trellis	32,000	3829 Kg	Rs. 170,000

Thus, through bringing barren land under cultivation and changes in various package of practices in Kharif and Rabi cultivations, the farmer has been able to augment his annual income by Rs. 181,000.



# IMPROVED AGRICULTURE PRACTICES

## Vegetable Cultivation – A Game Changer in Tribal Areas

### Background

Most farmers were unable to grow Rabi crops commercially due to lack of irrigation water availability and lack of information about advanced agricultural techniques. Farmers were, therefore, unable to raise their income. Under the project, the team planned focused approach to promote vegetable cultivation systematically. The project included a number of awareness-raising and training events aimed at encouraging and directing farmers to pursue Rabi growing.



### Project Interventions

- ▶ The team conducted a brief assessment of the kind of vegetables that are in demand in the neighbourhood market. Major crops like brinjal, radish, okra, cowpea, tomato, onion, bottle gourd, chili, and pumpkin are chosen for promotion among farmers.
- ▶ The growing of vegetables was introduced to farmers and members of Village Development Committees (VDCs) through a series of meetings. Topics covered are types of vegetables, scientific production techniques, and commercial viability that are appropriate for the project villages.
- ▶ A systematic set of trainings on advanced techniques like line sowing and the single-line trellis technique, combined with a scientific package of practices for each selected vegetable has been carried out with selected farmers.

- ▶ Considering the advanced techniques of vegetable cultivation, farmers were assisted with a variety of agri-inputs, including bamboo staking, staking weirs, vegetable seeds, and fungicides for seed treatment.
- ▶ In several crucial phases of the crop cycle, handholding support and regular technical advice were given to farmers by agriculture experts.
- ▶ Extensive water harvesting and recharge structures were carried out, which supported farmers for irrigation.

## The Change and Impact

- ▶ Currently, 74 acres of land in six villages (Hitekasa, Badbhum, Duggabahara, Petechuwa, Koriyatola, and Bheja Jangli) are being used for commercial vegetable farming by about 84 farmers. Numerous crops were grown, including bottle gourd, brinjal, radish, okra, cowpeas, tomatoes, and onions.
- ▶ The outcomes of the line-sowing and trellis techniques encouraged farmers to concentrate on vegetable growing, which is advantageous for generating extra revenue. About half of the cost of seeds has been saved because to line planting.
- ▶ From these villages, a total of approximately 1500 quintals of vegetables are produced each Rabi season.
- ▶ A lockdown conditions during the COVID-19 pandemic caused the market to close for almost 2.5 months, which had an impact on sales. Despite the market issue, all farmers together fetch gross income of Rs. 8.1 lakhs by selling vegetables within and nearby villages.
- ▶ On an average, rabi farming increased each farmer's net revenue by Rs. 22,000–25,000.





# Income Augmentation Through Adoption of Improved Agriculture Practices

## Background

Bahursingh Sori is a tribal farmer who owns 2.5 acres in village Dugabahara. Agriculture is his main source of income to support seven members of his family. Because the village is characteristically tribal and isolated, irrigation facilities are the primary concern. Farmers have been facing low agricultural production and, as a result, low agricultural income, mainly due to a lack of irrigation water and appropriate knowledge of farming practises. Before project interventions, Bahursingh typically used to cultivate paddy in Kharif season. With limited irrigation water available in dug well, his family was able to grow vegetables in a small patch of land during rabi season, primarily for home consumption.



## Project Interventions

- ▶ In year 2020, Bahursingh participated in training programmes and learned improved package of practices for growing vegetables and paddy from agriculture specialists.
- ▶ Noticing his progressive nature, the team started to give handholding support to him and provided assistance for agriculture inputs for SRI method of paddy cultivation and mixed farming in vegetable cultivation (okra, cowpea, bitter gourd, onion, etc.).
- ▶ To improve water use efficiency, the project team encouraged him by facilitating a subsidy for drip irrigation for Rabi cultivation, and made arrangements for partial financial support to make up for any shortfall.
- ▶ Of the total cost of Rs. 70,000 for drip irrigation, Bahursingh received a government subsidy of Rs. 35,000. He could contribute only Rs. 6,000 from his personal savings, leaving an uncovered gap of Rs. 29,000.

## Impact

- ▶ Bahursingh started growing vegetables in Rabi Session 2020 on 2.5 acres of land using drip system and technical assistance from experts. He was able to cultivate Rabi in an area of this scale for the first time and made Rs. 41,000/-.
- ▶ By modifying the package of practices for paddy cultivation, he is able to reduce cultivation costs by Rs. 4,000 per acre and increase productivity by up to six quintals per acre.
- ▶ All in all, he managed to increase his yearly earnings by Rs. 46,250.



Season		Crop Type	Land cultivated (acre)	Method of cultivation	Input cost per acre	Avg. Productivity-Qtl./acre	Total net income from crop
Kharif	Pre Project	Paddy	2.5 acre	Normal broadcasting	Rs. 13,000	14	Rs. 30,500
	Post project	Paddy	1.5 acre	Normal broadcasting	Rs. 13,000	14	Rs. 18,300
	Post project	Paddy	1 acre	SRI	Rs. 9,000	20	Rs. 27,000
Rabi	Pre Project	Vegetables	0.30 acre	Normal	Rs. 14,000	13	Rs. 9,450
	Post project	Vegetables	1.25 acre	Mixed Farming	Rs. 12,000	16	Rs. 41,000

# Organic Farming for Climate Resilience

## Background

On his family's six acres of land, Devendra Kumar Nagwanshi, a resident of Kaparmeta village, mostly cultivates paddy during the Kharif season. Since there is no source of irrigation, agriculture is dependent on rainfall. He has been growing paddy for a number of years with chemical fertilizers in an attempt to boost production. However, with soil fertility decreasing, the demand for fertilizers and pesticides kept increasing annually as a result of the long-term, continuous use of chemical fertilizers and pesticides. This caused a gradual decline in crop productivity as well as higher production costs.



## Project Interventions

	Before Project	Post Project
Paddy Crop Productivity (quintals/acre)	15	18
Annual fertilizer cost (6 acres land)	Rs. 90,000	Rs. 55,000

- ▶ Mr. Devendra gained knowledge about the value and application of organic farming practices through taking part in various kinds of training programmes and exposure visits. He contacted AFPRO to further acquire knowledge on preparing different organic manures like Brahmastra, Nimastra, Jiwamrit, GhanJiwamrit, Mathastra, and vermicompost and began putting them into practice.





- ▶ Moreover, under the project, Mr. Devendra received support for a farm pond which provided assured irrigation to his six acres of land during the Kharif and Rabi season.

## Impact

- ▶ Mr. Devendra started preparing organic fertilizers and manures and replaced 90% of the chemical fertilizers and pesticides with organic ones, resulting in a Rs. 55,000 annual cost savings. He is also able to increase paddy crop productivity by 20% by using SRI practices. Moreover, he is able to see the positive difference in soil quality of his farm.
- ▶ He has been able to earn an additional net income of up to Rs. 25,000 per year due to increased crop productivity, resulting in a net annual income of Rs. 80,000.



## Learnings



Inappropriate application of chemical fertilizers and pesticides reduce soil productivity and fertility, creating a vicious cycle of increased chemical use in agriculture. It also has a direct impact on climate change. Amplified use of organic fertilizer is the only way to break this vicious cycle.

# ALTERNATIVE AGRICULTURE PRACTICES FOR SUSTENANCE

## Mushroom Cultivation – A Profitable Venture

### Background

Erratic rainfall patterns and climate change have detrimental effects on farmers in Chhattisgarh state. Small and marginal farmers in tribal areas are hardest hit as they depend on rainfall for farming. In Rabi season, these farmers work as MGNREGS (Mahatma Gandhi National Rural Employment Guarantee Scheme) laborers. Though agriculture is the primary livelihood in the region, there is a dismal return for sustaining their families. This calls for exploring alternative agricultural practices for sustenance.

The diversity of climatic conditions in Chhattisgarh region and its vegetation make it a natural habitat for a number of mushroom cultivators. Moreover, women can get additional employment at home in the period between paddy cutting and summer cultivation.



### Project Interventions

- ▶ In the context described above, the team decided to diversify their income through small businesses. And the team discussed the idea with a few SHGs.
- ▶ Women from two self-help groups in Kaprmeta village and one self-help group in Nahanda village came up with this idea and actively began thinking about different enterprises.
- ▶ Mushroom cultivation was one of the ideas accepted by these groups during the discussion, recalling the success of 'Mushroom Woman, Ms. Namrata Yadu of Tendua village in Chattisgarh.

- ▶ Technical feasibility for mushroom cultivation was also undertaken for the region.
- ▶ The project assisted the groups in starting their businesses by providing equipment and raw materials such as spawn, plastic tray, cutter, roller, pesticides, shed net, and so on. The small business required a total investment of Rs. 6,500, plus labour costs. Women spent Rs. 1,500 and gave their man-days with it.
- ▶ These women received training and handholding support from the team in order to launch their business.



## Impact

- ▶ In the first year, all three groups were able to produce 180 kg of mushroom and earn a total of Rs. 28,800.
- ▶ Following the success of three women's groups, a total of 11 women's groups (77 members) in four villages cultivated mushrooms in 2019, earning a gross annual income of Rs. 1.3 lakh by selling 935 kg of mushrooms.
- ▶ Again, in 2020, as many as 30 groups adopted mushroom cultivation, producing 21 quintals and earning Rs. 2.52 lakh in gross income.
- ▶ This intervention resulted in an additional income of Rs. 1,000 - Rs. 2,000 per woman per year in lean agriculture period.
- ▶ The women are encouraged to feel independent by learning business skills. It has increased their self-esteem.

Year	No of Units.	No. of women members	Production (Kg)	Market Rate Rs./Kg	Gross Annual Income	Net Annual Income
2018	3	26	180 Kg	160	Rs 28,800	Rs. 23,700
2019	11	77	935 Kg	140	Rs. 130,900	Rs. 111,100
2020	30	167	21 Quintal	120	Rs. 252,000	Rs. 207,000



## Learnings

- ▶ Women have identified a good scope to earn additional income in the lean agriculture period.
- ▶ Small enterprises have boosted the confidence of women and started new para-ventures such as mushroom pickle making, dry mushroom, mushroom power, and so on, with the support of the Bihan Yojana of Chattisgarh State for better price realisation through women SHGs.





# CLIMATE SMART AGRICULTURE

## Systematic Rice Intensification – A Game Changer

### Background

In general, Durgesh Kumar was discontented with his farming system, its output, and his revenue, which was insufficient to feed his six family members. Out of the six acres he held, only 2.5 could be farmed; the remaining land remained uncultivable due to a lack of irrigation water and rising production expenses.

Generally, in the selected area, majority of the farmers are experiencing similar circumstances due to the vicious cycle of climate change and unsustainable use of agro-chemicals along with irrigation water for farming. Durgesh Kumar Kumeti, a small tribal farmer who lives in Duggabahara village, also used to constantly struggle with these problems. Climate change effects like increase in temperature, variability of rainfall in the kharif season, etc. disturbed the overall planning of paddy cultivation and the economics of Durgesh Kumar. The family could take only a single crop of paddy, and after that, they had to work as MGNREGA laborers to meet the end.



### Project Interventions

The project has been instrumental in giving a push for adopting the SRI (Systematic Rice Intensification) method of cultivation for better productivity and reduced input costs. Durgesh attended training programmes under the project on SRI and received technical handholding support. In addition, the initiative is assisted by the provision of organic fertilizer, weeder, seed treatment pesticide, and high-quality seeds.

The system of rice intensification (SRI) involves cultivating rice with as much organic manure as possible, beginning with young seedlings planted singly at a wider spacing in a square pattern; occasional irrigation that keeps the soil moist but not flooded; and regular inter cultivation with a weeder that actively oxygenates the soil. SRI isn't a pre-packaged, pre-programmed technology solution. It's more of a set of principles, a system for sustainably managing and saving resources

- ▶ As a result, in 2021, Durgesh shifted to SRI techniques on 1.0 acres of land.
- ▶ Later, he also undertook SRI on the remaining 1.5 acres of land with his own learnings.

## Impact

- ▶ When paddy was grown using conventional methods, it would only produce 12–15 panicles; whereas, Durgesh is able to obtain an amazing 50–60 panicles through application of hybrid variety and SRI methodology.
- ▶ He is able to produce 30 quintals of paddy per acre and earn a net income of Rs. 58,800.
- ▶ Moreover, the required water level in SRI paddy is much lower as compared to conventional cultivation.



## Learnings

The SRI technique's primary objective is to boost output while considering the limited availability of water resources. SRI is unquestionably a game-changer. It's more of a set of guidelines, a method for managing resources sustainably and maximizing productivity by altering the way land, seeds, water, nutrients, and labor are used from a small but well-tended number of seeds.



# SCIENTIFIC CULTIVATION PRACTICES

## Small Farmer with Big Hopes – Systematic Efforts to Utilize Opportunities and Resources

### Background

Kosmi village was converted from forest land to a revenue village in 2015. Being part of a forest region, the overall development of the village was low. A paradigm change in farmers' adoption of scientific farming practices for improved livelihoods was largely facilitated by the project.

One of the farmers, Siya Ram Thakur, is a small farmer who owns six acres of land. His nine-member family makes a living solely from agriculture, mostly from the paddy crop, which is the only significant crop grown in the area during the Kharif season. Siya Ram was only able to make a meager living from his land since he was not aware of more effective farming techniques. He was also unable to take Rabi cultivation since there was no source of water. Thus, in order to augment their earnings, his family worked as daily wage workers under the MGNREGS and collected mahua and betel leaves (also known as Tendu leaves) in the forest throughout the winter.





# Project Interventions

▶ The project's main goal was to raise awareness of scientific agricultural practices by providing a variety of trainings and demonstrations. Siya Ram participated in a training program in 2017 which includes SRI techniques and other contemporary agricultural practices.



- ▶ Being an aspirational farmer, he took the first step by converting his 0.25 acre of land out of 3 acres from the conventional method of paddy cultivation to the SRI method with guidance and input assistance from the project team, despite various doubts raised by his family members.
- ▶ Taking his efforts in to the consideration, the project team encouraged him and supported him to build farm pond under water resource conservation theme in his field to overcome dry spells and give critical irrigation to kharif crops.
- ▶ Furthermore, the project helped him build a trellis to cultivate bitter gourd during the Rabi season.

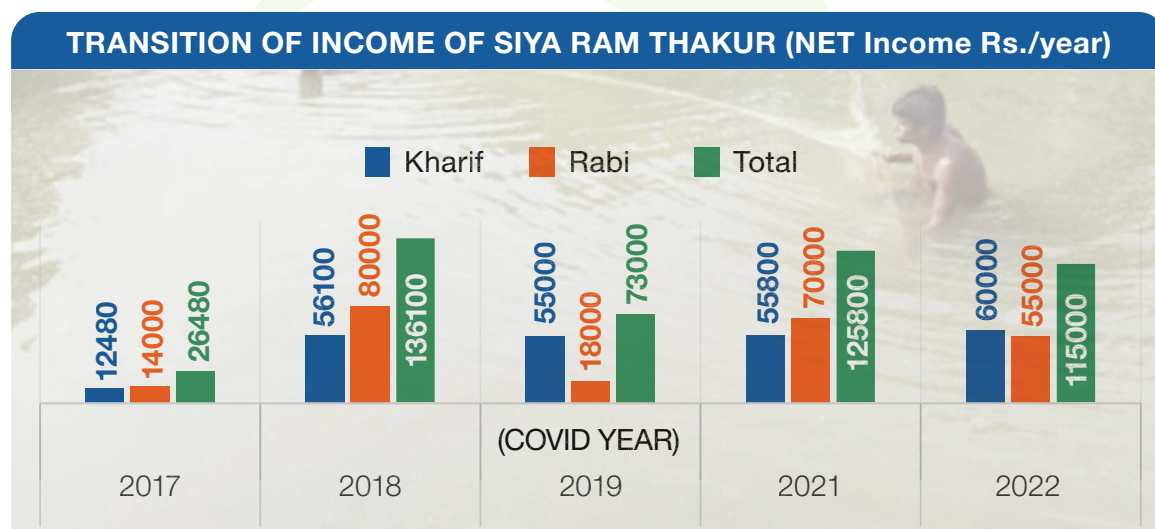


## Impact

- ▶ Farmers were able to obtain 8 quintals in 2017 after using the SRI method, as compared to 3 quintals the previous year on his small 0.25-acre plot of land (i.e. increasing from 12 quintals to 32 quintals per acre). This represents an almost 2.7-fold increase in productivity. Using old, traditional methods, one plant could yield 12–15 panicles; he was able to produce 60–65 panicles on it.
- ▶ Looking at the results of the change in agricultural practices, his family members have now started supporting him for labor work to minimize labor costs on his farm.



- ▶ Water availability allowed him to cultivate bitter gourd on 0.25 acres of land using a trellis system during the Rabi season, earning him Rs. 12,000.
- ▶ In light of the changed farming methods, his family members have recently begun giving him assistance with work in an effort to reduce labor expenses on his farm.
- ▶ In 2018, he obtained additional knowledge about growing vegetables and sought technical advice from the Government Horticulture Department, Mohara, and the AFPRO team. He began growing vegetables such as okra, sting beans (barbati), bottle gourds, bitter gourds, guar, and ridge gourds (torai) on the advice of others, and he made Rs. 80,000.
- ▶ He bought a transport vehicle with the earnings so he could sell vegetables to neighborhood markets and make more money.
- ▶ After learning about the advantages of better agricultural methods from the project trainings, he chose to gradually switch to organic farming for greater soil health and started producing organic fertilizers and pesticides at his farm.
- ▶ In the year 2019, the horticulture department, Mohara provided storage house for the vegetable cultivation and now he is utilizing it very efficiently.
- ▶ He started raising fish in his farm pond in 2020 for his family's nutritional needs as well as commercial gain.



## Learnings

- ▶ By improving agricultural techniques, making use of available resources, and creating chances for farm-based livelihoods, this forward-thinking farmer has increased his income year after year from the meager resources he had.
- ▶ Even though the majority of farmers were negatively impacted by lockdowns during the COVID-19 pandemic, Siya Ram increased farm-based income, thus serving as an inspiration to other farmers.



# DIVERSIFIED INCOME OPPORTUNITY

## Fish Farming – A Group Endeavour to Earn

### Background

A tribal settlement called Kosmi was founded in 1985 when migrants from the submerged area of "Gangrel Dam" settled here. This village has turned into a revenue village in 2015. There are two Earthen Dams in the village. The Barhi Bahara dam was constructed in 1988, while the Jogi Konha dam was built in 1995. Both were built and renovated by MGNREGS and other departments. The water was largely used for agriculture by the local farmers. However, as time went on, seepage from both dams started, and water couldn't be stored for longer periods of time. Following the renovations completed as part of the project, a group effort to generate money through fish farming was proposed by women farmers.



<sup>2</sup>Integrated fish farming is a system of producing fish in combination with other agricultural/livestock farming operations centered around the fish pond.



## Project Interventions

- ▶ In 2016–17, repair work was carried out by constructing core-walls of black cotton soil in these two dams under the project. This has improved the capacity of the dams to store water by decreasing seepage losses which has boosted water availability by around 85–90 days.
- ▶ One of the women's self-help groups, “Gyan Ganga Didi Bank,” comprising 16 women from the village, put forward the idea of fish farming. After prior permission from the village committee and panchayat, they started the initiative for the first time in 2019.
- ▶ Inputs and handholding support were given under this project. Considering their enthusiasm, 20 kg of mixed breed fish seeds, 80 kg of fish feed, and one fishing net, along with technical guidance on various stages were provided to start the initiative.

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**We are highly grateful to EdelGive Foundation and AFPRO for guiding and supporting us in creating additional livelihood opportunity in our small tribal village.**

– Gyan Ganga Didi Bank Members

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## Impact

- ▶ Following the initial trial in 2019, the group paid the panchayat Rs. 7,500 to lease two dams for a period of three years. They also invested an additional Rs. 20,000 for fish nets and fish seeds, comprising the varieties like Common Carp, Rohu, and Katla. In the first year, they managed to produce 4.56 quintals of fish, bringing in a gross income of Rs. 45,600/-by selling the fish for Rs. 100/-per kg. They made a net income of Rs. 18,100/-from this sale. They now feel more confident as a result.
- ▶ Since then, the group has kept up its annual fish rearing operations, bringing in a net income of between Rs. 25,000 and Rs. 35,000, which allows them to collect additional revenue from the dams.

Income Generation from Fish Farming						
Year	Investment on lease (in Rs.)	Investment on Seeds by women Group (in Rs.)	Investment on Fish Net (in Rs.)	Production in Kg	Gross Income (in Rs.)	Profit (in Rs.)
2019	7,500	10,000	10,000	456	45,600	18,100
2020	0	4,500	0	388	31,040	26,540
2021	0	6,000	0	450	36,000	30,000
2022	0	9,000	0	409	44,990	35,990
4 years cumulative	7,500	29,500	10,000	1703	157,630	110,630





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