ST & SC Development
Minorities & Backward Classes Welfare Department
Government of Odisha



LIVELIHOOD COMPENDIUM

Person Featured on the Cover Page:
Ms. Sukanti Dehury
Village : Amadahara , Block : Banspal
District : Keonjhar, State : Odisha

We thank Ms. Sukanti Dehury for agreeing to be featured on the cover page of this compendium.

Photo Credit: Bapi Nayak, PRADAN

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ABBREVIATIONS AND ACRONYMS

AB: Adarsha Bagicha
AE: Agri Entrepreneurs
AKS: Asha Kiran Society
APC: Agriculture Production Cluster
ASCO: Assistant Soil Conservation Officer
AHO: Assistant Horticulture Officer
BMGF: Bill & Melinda Gates Foundation
BPM: Block Programme Manager
BSPU: Basic Seed Production Unit
BSKY: Biju Swasthya Kalyan Yojana
CAHWs: Community Animal Husbandry Workers
CBO: Community Based Organization
CEO: Chief Executive Officer
CFR: Community Forest Rights
CFRR: Community Forest Resources Rights
CLF: Cluster-Level Forum
CR: Community Rights
CRPs: Community Resource Persons
CSB: Central Silk Board
CSOs: Civil Society Organizations
DAP: Di-Ammonium Phosphate
DDH: Deputy Director of Horticulture
DFLs: Disease Free Layings
DMF: District Mineral Fund
DRDA: District Rural Development Agency
EPVG: Extremely Poor and Vulnerable Group
ET: Enterotoxaemia
FES: Foundation for Ecological Security
FMD: Foot and Mouth Disease
FMC: Forest Management Committee
FPO: Farmers Producer Organization
FRA: Forest Right Act
FYM: Farm Yard Manure
FY: Fiscal Year

ABBREVIATIONS AND ACRONYMS

GI: Galvanised Iron
GP: Gram Panchayat
GPLF: Gram Panchayat-Level Federation
HAPCL: Hingula Agri Private Company Ltd
HH: Household
IFR: Individual Forest Right
INRM: Integrated Natural Resource Management
IT: Information Technology
ITDA: Integrated Tribal Development Agency
IEC: Information, Education and Communication
JMA: Janamukti Anusthan
KALIA: Krushak Assistance for Livelihood and Income Augmentation
MGNREGA: Mahatma Gandhi National Rural Employment Guarantee Act
MGNREGS: Mahatma Gandhi National Rural Employment Guarantee Scheme
MKSP: Mahila Kisan Sashaktikaran Pariyojana
MoP: Muriate of Potash
MoTA: Ministry Of Tribal Affairs
MRP: Maximum Retail Price
MT: Metric Ton
NGO: Non-Governmental Organization
NABARD: National Bank for Agriculture and Rural Development
NFP: Non-Forest Product
NRTT: Navajbai Ratan Tata Trust
NTFP: Non-Timber Forest Produce
OAIC: Odisha Agro Industries Corporation
OLIC: Odisha Lift Irrigation Corporation
OLM: Odisha Livelihood Mission

ABBREVIATIONS AND ACRONYMS

OTELP: Odisha Tribal Empowerment & Livelihood Program
OTFD: Other Traditional Forest Dwellers
PDS: Public Distribution System
PD: Project Director
PEC: Project Execution Committee
PG: Producer Group
PPR: Peste des Petits Ruminants
PPs: Project Participants
PRADAN: Professional Assistance for Development Action
PRI: Panchayati Raj Institution
PRADAN: Professional Assistance for Development Action
PVTG: Particularly Vulnerable Tribal Group
SBM: Swachh Bharat Mission
SC: Scheduled Caste
SDLC: Sub Divisional Level Committee
SFURTI: Scheme of Fund For Regeneration of Traditional Industries
SHG: Self Help Group
SHRISTI: Society for Harmonious Renaissance of Ideas through Simple Technological Initiatives
SOOVA: Social Organization on Various Aspects
SRI: System of Rice Intensification
ST: Schedule Tribe
TP: Transit Permit
TRCS: Tasar Rearers Cooperative Societies
TDF: Tasar Development Foundation
TP: Transit Permit
TVS: Tasar Vikas Samiti
TU: Trickle Up
UM: Udyog Mitra
UVS: Udyan Vikas Samiti
VO: Village Organization
VHND: Village Health and Nutrition Day
WHS: Water Harvesting Structures





Shri Sanjeeb Kumar Mishra, IAS
Principal Secretary,
Department of ST & SC Development,
Minorities & Backward Classes Welfare,
Government of Odisha

MESSAGE

It gives me immense pleasure to introduce the Compendium on Livelihoods Best Practices in Odisha, a resource that captures livelihood models with the potential to foster sustainable and inclusive development for the tribal communities of the state.

This compendium showcases 11 livelihood prototypes developed and strengthened through the combined efforts of government agencies and Civil Society Organisations (CSOs). These models have been successfully implemented in diverse contexts, ranging from integrated natural resource management to the revival of traditional practices like Tasar sericulture.

I extend my sincere appreciation to ITDAs, PRADAN, and all the CSOs for their invaluable efforts in documenting these best practices. This compendium is more than a collection of case studies—it is a guide for policymakers, practitioners, and researchers to replicate and scale these initiatives.

As we continue to work together toward creating an equitable and sustainable future, I hope this compendium serves as a source of inspiration and a catalyst for meaningful action.

Shri Sanjeeb Kumar Mishra



Dr. Poma Tudu, IAS
Director (ST), Department of
ST & SC Development, Minorities &
Backward Classes Welfare,
Government of Odisha

MESSAGE

It is with immense pleasure and pride that I introduce this comprehensive compendium on the best livelihood practices of civil society organizations (CSOs) and government agencies for the development of tribal livelihoods in Odisha. This resource has been developed with the contributions of CSOs working at the grassroots, namely Asa Kiran Society, FES, Janmukti Anusthan, PRADAN, Seba Jagat, SHRISTI, SOOVA, TDF, Trickle Up, Vasundhara, and the government agency ITDA Baliguda.

The compendium comprises 11 livelihood prototypes, primarily covering topics such as natural resource management, farm-based livelihoods, tasar sericulture-based livelihoods, goat rearing, and poverty reduction among the ultra-poor adopting a graduation approach. This invaluable resource, meticulously prepared by PRADAN in consultation with the ST & SC Development, Minorities & Backward Classes Welfare Department, will undoubtedly be useful for ITDAs and other agencies in designing and scaling up various livelihood projects.

This compendium is a valuable resource that will aid policymakers, development practitioners, researchers, and grassroots workers in understanding the nuances of tribal livelihoods and the effective strategies that can be employed to enhance their socio-economic well-being. By highlighting successful case studies, it offers practical insights into what works on the ground and how these approaches can be replicated and scaled up.

I extend my best wishes to the SPMU, MMJJM Team and PRADAN for their dedicated efforts in compiling this compendium, which will serve as a valuable resource for knowledge sharing in tribal development.

Dr. Poma Tudu



Shri Narayan Chandra Dhal, O.A.S. (S.A.G.)
Mission Director, MMJJM,
Department of ST & SC Development,
Minorities & Backward Classes Welfare,
Government of Odisha

MESSAGE

The livelihoods of tribal communities in Odisha are deeply rooted in their traditional knowledge and practices, over the years, various initiatives implemented by both CSOs and Government agencies have been undertaken to ensure sustainable and dignified livelihoods for these communities by integrating modern practices with indigenous wisdom.

This Livelihood Compendium is a testament to the transformative impact of such initiatives, showcasing successful models that have uplifted rural communities through integrated natural resource management, sustainable agriculture, sericulture, and community-led enterprises. These models not only enhance income opportunities but also foster self-reliance and social empowerment, particularly among women and vulnerable groups.

I am sure these livelihoods models will be useful while we design livelihoods intervention plans under MMJJM which is operational with 22 Tribal Development Agencies (ITDAs) in 13 districts. The livelihoods models mentioned in this compendium highlights the role of peoples' institutions to sustain livelihood interventions as well as active role of a facilitating agency may be from Government or Civil Society Organization side. We are promoting Janajati Jeevika Parishads (JJPs) to sustain livelihood interventions with active facilitation of ITDAs and FNGOs.

The Department of ST & SC Development, Minorities and Backward Classes Welfare Dept remains committed to strengthening these efforts through policy support, convergence of government schemes, and collaboration with civil society organizations. I extend my heartfelt appreciation to PRADAN, ITDAs and all CSOs who have contributed to this compendium

Shri Narayan Chandra Dhal



Mr. Saroj Kumar Mahapatra

Executive Director,

PRADAN

FOREWORD

Over the last two decades, Odisha has witnessed significant growth alongside notable poverty reduction. Access to basic services and amenities has gradually expanded to the interior pockets of the state. PRADAN, along with several other Civil Society Organisations (CSOs), has collaborated with the ST & SC Development, Minorities & Backward Classes Welfare Department, the Department of Agriculture & Farmers' Empowerment (DAFE), Mission Shakti, and other key entities to enhance the reach and impact of livelihood programs. Given the diversity and agro-climatic conditions of Odisha's tribal regions, there was a pressing need to study and document various livelihood prototypes for inclusion in the existing portfolio of initiatives being implemented by Integrated Tribal Development Agency (ITDA) and other departments.

Civil Society Organisations, working in some of the most challenging geographies, have been experimenting with diverse on-farm and off-farm livelihood activities tailored to the needs of tribal communities in Odisha. These efforts have been supported by government programs, National Bank for Agriculture and Rural Development (NABARD), and philanthropic organizations. This documentation highlights 11 livelihood prototypes, though additional evolving models may be documented in the future.

It is essential to acknowledge the commitment and passion of the organizations whose unwavering support has enabled tribal families to harness their inherent potential, access critical resources, and build resilient livelihoods. This compendium covers livelihood prototypes focusing on ultra-poor strategies, Integrated Natural Resource Management (INRM), agri-horticulture-based livelihoods, livestock-based livelihoods, and end-to-end livelihood interventions through Farmer Producer Companies (FPOs).

PRADAN has had the privilege of working with the ST & SC Development, Minorities & Backward Classes Welfare Department on various projects for over a decade. Documenting these prototypes has provided us with a valuable learning opportunity to understand the various livelihood intervention strategies adopted by ITDAs and CSOs.

I extend my gratitude to my colleagues at PRADAN for their keen interest in collaborating with CSOs, government departments, academia, and practitioners. Their effort in understanding the context, rationale, socio-economic feasibility, sustainability, and scalability of these prototypes have been instrumental in producing this compendium.

I am hopeful that this compendium will inspire meaningful discussions and actions among ITDAs, government departments, CSOs, and other stakeholders to scale up these prototypes in suitable contexts and geographies.

S.K.Mahapatra

Mr. Saroj Kumar Mahapatra

ACKNOWLEDGEMENT

We extend our deepest gratitude to all the 15 CSOs who showed keen interest to contribute their livelihood prototypes for the compendium and participated in the webinar. We received 19 draft livelihood prototypes from both CSOs and ITDAs; however, after field visits, 11 prototypes were finalised for further documentation.

We thank Mr. Dolagobinda Panda who led this process of producing this livelihood compendium. He played a crucial role in shaping the draft livelihood prototypes into a complete shape through conducting field visits, interviews, writing and editing of the articles. Mr. Sankarsan Behera assisted him in field visits, interviews, writing, and editing of the articles. We also thank Mr. Sankarsan Behera and Mr. Santosh Kumar Nayak for designing of this compendium visually .

We thank Dr. Sutapa Pati, Academic Dean, School of Sustainability, XIM University for her invaluable feedbacks to improve this compendium. We also thank Mr. Soumik Banerjee, an independent consultant, for reviewing our prototypes and providing us critical inputs.

We would like to express our sincere appreciation to Mr. Ajit Kumar Naik, Mr. Kirttibhusan Pani, Mr. Surjit Behera, Mr. Hemendra Kumar Pratihari, Mr. Ashisa Rath, Mr. Hrudayananda Mohapatra, Ms. Jyotirekha Roy Pradhan, Ms. Mitali Mohanta, Mr. Rakesh Kumar, and Mr. Prakash Behera whose expertise and dedication have enriched this compendium. Your valuable insights and experiences have added depth and diversity to the knowledge shared within these pages.

Last but not the least, we express our thanks to all those behind the scenes who offered their unwavering support and encouragement throughout the process. This Livelihood Compendium is a collective effort, and each individual involved has played a crucial role in its creation. Your commitment to the cause of sustainable livelihoods is reflected in the pages of this compendium, and we are truly grateful for your contributions.

Thank you
Editorial Team

THE INTEGRATED NATURAL RESOURCE MANAGEMENT MODEL OF BHADUBEDA

A model devloped by PRADAN

Background

Integrated Natural Resource Management (INRM) implies understanding the interrelationship between all five natural resources- land, water, forest, animals, and human beings, in a given context and proposing management and conservation measures for optimal utilization of resources. It has the potential to change the village scenario and the life and livelihood of villagers. However, it is quite an intensive plan and needs the participation of multiple stakeholders for its complete implementation. The INRM planning of village Bhadubeda started with support from ICEF (Indo-Canadian Environmental Facility) in 2002. further additional components were supported by the Mahila Kisan Sashaktikaran Pariyojana (MKSP) project from 2015-18. Later additional structures were implemented under MGNREGA in 2018.

About the Village

Bhadubeda is a tribal-dominated village in the Karanjia block of the Mayurbhanj district. It has four hamlets with 135 households and a population of 760 (Census 2011). The village has 77% Scheduled Tribe (ST) households, 6% Scheduled Caste (SC), and the remaining are from Other Backward Classes (OBCs). The major tribes residing in the village are Bathudi and Saunti. The village comes under the North Central Plateau agroclimatic region with 1648 mm of rainfall per annum.

The village is close to a forest with mostly Asan (*Terminalia elliptica*) and Sal (*Shorea robusta*) trees. However, the shrinking forest cover had been putting stress on women for fuelwood collection and leaf plate making in which they were principally engaged. The village has undulating topography, with a clear division of upland, medium land, and low lands.

Out of the total 70 ha of cultivable land- 57% is upland, 28% is medium upland and 15% is lowland. Among the 40 ha of uplands: 62% were unbunded which could not be used for cultivation purposes and is subject to heavy erosion. A small stream passes in the periphery of the village.

The village has clayey loam soil and thus cultivating vegetables is difficult due to poor drainage. Thus Paddy was the only crop taken during Kharif under rainfed conditions; the region also experiences drought every alternate year due to low or erratic rainfall.

The above conditions made production from Paddy unpredictable and dependent on favourable weather. The paddy yield was 2 MT/ha; except for the small stream that served for the irrigation of seven families only, there were no sources of irrigation. There is a big common pond in the village and it served the domestic needs of the village and animals. Most of the youth and men of the village used to migrate to cities for cash earnings.

Intervention of PRADAN

PRADAN facilitated Self Help Groups (SHGs) in the village in the year 2000, which graduated into second-tier clusters by 2003. At present, 13 SHGs have been groomed and organized as transparent and vibrant bodies of women working on savings and credit as well as on other developmental issues. The village cluster serves as a forum for women where they could discuss their issues, problems their households are facing and issues of the village at large.

PRADAN had also initiated the INRM practices funded by ICEF that focused to enhance the food security of the households and provide additional income to the households. The vibrant SHGs and clusters laid the foundation for quality planning and implementation of the INRM model.

Steps in INRM planning and implementation

The significant components of INRM planning and implementation are:

1. **Community Mobilisation**
   a. Village Selection- The village was selected as per the Poverty criteria and land topography.
   b. Concept Seeding- Initially 2-3 meetings were conducted with the SHGs and community to understand the concepts and components of the INRM interventions.
   c. Exposure-An exposure was conducted to Bandudi Watershed in Purulia district of West Bengal in 2003. SHG members and male counterparts from their families participated in exposure and saw works on land treatment, farm ponds, ring well, plantation, vermicomposting, SRI method of paddy cultivation, and fish cum duck rearing and also interacted with the farmers and community there.
   d. Formation of Hamlet Level Association- Four Hamlet level committees (Jala O Jami Vikas Samiti) were formed with 116 women having a membership contribution of Rs 25 per household.
   e. Formation of Project Execution Committee- The Project Execution Committee (PEC) was formed by taking representatives from each hamlet and SHG representatives. The PEC monitored the overall implementation of the program in the village.

2. **Participatory Planning Exercise**

Meetings along with transact walk were conducted at each hamlet level by the hamlet level associations to finalise the INRM plan.

Baseline data collection- To get an overall idea of the village on demography, land category, land use, and other socioeconomic profile of people the following information was recorded-

   a. **Resource Mapping-** To get an overview of available resources
   b. **Ownership Mapping-** Understanding land ownership patterns
   c. **Identification of Problem-** To understand in detail the problem of each patch of land (soil quality, soil degradation, water holding capacity, crop growth and yields etc) were discussed and identified.
   d. **Option Generation-** Suitable options of intervention on each plot were discussed.
   e. **Prioritisation of options-** The feasible options were prioritised and activities were finalised.

3. **Participatory Action Plan preparation**
   a. **Preparation of Action Plan-** An action plan was prepared with the list of activities to be implemented and the role and responsibilities of different members.
   b. **Identification and grooming of village-level experts-** Four village-level experts were identified, one from each hamlet who supported in layout and measurements of the implemented activity.
   c. **Budget Preparation-** The budget for the whole plan was prepared. The contribution of people and the contribution of the funding agency was finalised.

4. **Implementation of Activities and Follow up mechanism**
   The activities were implemented according to the Action Plan prepared. The Hamlet level association and PEC continued the monitoring and follow-up with the concerned actors to ensure timely implementation.

INRM interventions specific to Bhadubeda

The main issues in the village were: lack of irrigation sources, unbunded uplands and shrinking forest cover leading to a lack of fuel wood.

To address the problems 4 approaches were followed:

1. Land Treatment measures to capture the surface run-off and enhance soil moisture conservation.
2. Bunding of unbunded land and converting it from unutilised lands to cultivable lands.
3. Vegetative cover to secure soil moisture and enhance fertility.
4. Round the year crop plan to optimally utilise the land and water resources for significant livelihood gain.

The details of the various models taken up in the program is given below-

Attributes/ Problem of Land	Structural Measures	Benefits
Upland 5-8% slope, low soil moisture & fertility	30x40 model: for in-situ soil and moisture conservation. The plot is divided 30 ft * 40 ft (30 ft along the slope & 40 ft across the slope). Pits of 100 cft are dug out at the lowest point in each plot & bunding of the plot is done using the soil dug out of the pits. Further, this land was planted with Cashew, Mango, Eucalyptus, Teak, Gamhar (Gmelina arborea), Acacia and Sisoo (Dalbergia sisoo).	This helps in breaking the speed of water flowing thus preventing soil erosion and enhancing soil moisture conservation and recharge of aquifers. The barren plots started to have good growth of grasses within a year.
Medium land with 3-5% slope	5% model: for in-situ water conservation in paddy growing medium lands. A pit is constructed on the highest point in the plot comprising the 5% area of the whole plot. Field bunding is also carried out (top width: 0.5 to 1.5 feet, side slope 1:1 to bund height and depth).	The water stored in the pit can be used for irrigation in case of dry spell. The structure is extremely beneficial for paddy cultivation. Field bunding helps in converting uncultivated lands to proper plots which can be used for cultivation.
Lowland with less than 2% slope	Structures like Dug well, Ring well and Farm ponds are created to harvest water in the discharge zone. Water Harvesting Structures (WHS): A water harvesting tank is constructed for in-situ moisture conservation on the depression side of a plot, which conserves rainwater/surface runoff. The normal size of one WHS is 100 ft X 50ft X 6 ft. However, sizes are often modified depending on land availability for the farmer	The available water is used for irrigation, fishery, duck rearing, etc.



Plate-1: 30*40 model in Bhadubeda



Plate-2 : 5 percent model in Bhadubed

Photo Credit: PRADAN, Jashipur

Impact of INRM interventions/ICEF

Key Output

1. Out of 25 Ha of unbunded cultivable wasteland, 18 ha (72%) was brought under 30 X 40 in situ soil and water conservation measure with plantations. Ninety-eight families (73% of the total families & 85% of total committee members) benefited from this plantation of fruit trees namely- 1932 cashew plants and 101 Mango plants. A total of 11,534 timber trees (Gamhar, Acacia, Eucalyptus, Teak) were also planted as block and boundary plantations around fruit tree plantations.
2. 7 hectares of medium upland land was covered under the 5% model assuring Paddy for 35 families.
3. Irrigation facilities were provided to 100 families through the construction of 51 Water Harvesting Tanks (for 64 families), 16 Dug Wells (for 16 families), and stream-based irrigation (for 20 families). These interventions provided assured irrigation to 20 ha of the Kharif crop and 10 ha for the rabi crop.
4. Almost all ponds were utilized for Pisciculture, providing nutritional supplements to the family.

Key impacts

1. The land and water treatment of the village increased the water table of the village. The period of water availability also increased.
2. Paddy crop was ensured due to the 5% structures; with the adoption of SRI productivity went up from 2.5 to 5 MT/ha
3. Farmers have taken up Pisciculture and Duck rearing in the ponds adding to the nutritional well-being as well as cash income of Rs.10,000 and above from small farm ponds.
4. Farmers have been able to earn Rs 50,000 and above by cultivating paddy in 1 acre and vegetables in 25 decimals in rabi.
5. Also, from plantations of Eucalyptus, Acacia, and Teak, many families have earned income ranging from Rs 20,000-50,000 per family by selling these timbers after around 15 years.
6. The distress migration from the village has stopped and families earned enough to invest in alternative businesses-like clothes and grocery stores.

Interventions and Impact of MKSP

Interventions

1. 3 Ring wells were constructed benefitting 12 families and a Lift Irrigation System benefitting 15 women farmers has been installed.
2. 123 people took up improved vegetable cultivation along with paddy, adopting some Non Pesticide Management (NPM) practices.
3. Deworming and Vaccination of Goats and Poultry birds were also ensured.
4. New crops like Pointed Gourd and Trellis Farming were introduced in the village
5. Other interventions included: Sensitization on Gender Discriminations, Awareness of Acceptance of Women Farmers, and Linkages with Gram Panchayat, Block, Bank and Agriculture Department to avail Govt schemes.

Impact

1. The interventions under MKSP organized the Women Farmers into Producer Groups
2. Pointed Gourd cultivation provided a high income of Rs 1 Lakh to selected farmers.
3. Infrastructure created under MKSP provided irrigation for longer periods to more households and thus more families took up the second crop.
4. The land treatment measures implemented during the ICEF project helped raise the groundwater table; thus the Ring Wells had water available around the year of up to 4 to 5 feet.

Kaushalaya Naik and her husband Hara Naik of Bhadubeda have 5 acres of land which included 1 ac of cultivable upland 1.5 ac of medium land and remaining 3.5 ac of upland. They have implemented 30x40 model and Timber plantation on their upland along with a farm pond.

Currently they are able to cultivate Paddy in 1.5 acres with a production of 25 quintals; they are also cultivating vegetables in 0.25 acre and earning Rs 20,000, Duck & Fish in their pond brought in Rs 26,000. After harvesting part of their timber plantation, they earned Rs 50,000 and constructed a pucca house. Their three daughters are pursuing higher studies.

Kaushalya credits the transformation of her family as well as 16 other families in the village to the INRM interventions. She is now well respected in the village and her family is a role model in the village.



Photo Credit: PRADAN, Jashipur

Plate-3: 30*40 model in Bhadubeda

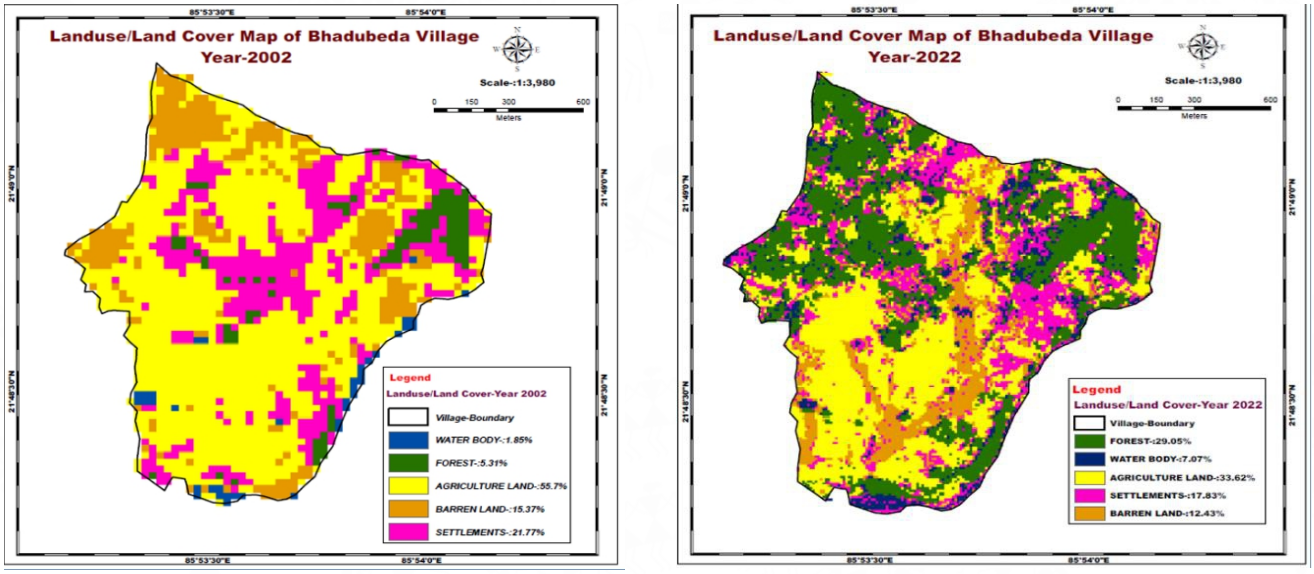


Fig 1 shows the Change in Land Use Pattern from 2002-22

Source: Curated by PRADAN

Fig 1 shows significant positive change in the land use pattern of Bhadubeda in the last 20 years- Forest area has gone up from just 5.3% to 29%, water bodies have increased 1.8% to 7% while Barren land has declined from 15.4% to 12.4%.

Impact of MGNREGS

Since several land and water interventions were being made since 2003, the villagers had realized the value and outcome of such interventions and thus readily took up activities to further saturate the village.

Status : 2018 to 2021

1. 6 new Farm ponds were constructed, and Land Levelling was done on additional 3 acres.
2. Women were actively engaged in Duck rearing, Backyard Poultry, and Pisciculture.
3. Villagers are now more interested in the plantation in their homesteads, unutilised land, and farm pond bunds. They have planted several timber and fruit trees like Papaya, Banana and Moringa supported by Odisha Livelihood Mission (OLM) under Mo Upakari Bagicha Programme and saplings obtained from Forest Department.
4. SHGs have been integrated under the Agriculture Production Cluster (APC) programme of Dept of Agriculture, since 2019 through convergence from the Department of Agriculture, Horticulture, Integrated Tribal Development Agency (ITDA) etc.
5. Women are actively engaged in Vegetable and Paddy cultivation both for consumption and sale.

Scalability & Sustainability

This model of intervention is suitable for hilly and plateau areas where groundwater is scarce and crops are affected due to uncertain and erratic rainfall. Paddy is the major crop for tribals in the area and water requirement is critical to its cultivation, especially during transplantation, flowering and fruiting stage. Crop failure usually ensues if water is not available during these critical stages. The INRM model of land treatment like 5%, 30x40 and Farm Ponds has secured paddy as well as raised the groundwater level. After reaping the benefits and understanding the impact villagers are maintaining the 5% structures themselves.

Farmers from adjacent blocks and districts are demanding such interventions under MGNREGS. All these activities are now approved schemes under the Watershed, OTELP, OPELIP and ITDA . With the assurance of the second crop, migration has stopped and Women SHGs under Mission Shakti have ventured into multiple livelihood generation activities. Mission Shakti organized women into Producer Groups with program support from NRLM and the State's fund.

Way Ahead

A multi-department convergence model may be developed with a 4-5 year intervention plan starting with INRM treatment of the villages and linkages with Mission Shakti, Horticulture, Agriculture, Animal Husbandry, Fisheries and ITDAs. For tribal villages, the initiative may be led by the ITDAs organizing community institutions or through NGOs as facilitating agencies.

ADARSHA BAGICHA:

An integrated Agro-Horti-Forestry-based model to attain Self-sustainability for small farm holder Tribal Farmers in Lamtaput block of Koraput

A model devloped by Asha Kiran Society

The "Adarsha Bagicha" is an integrated Agro-Horti-Forestry-based model inspired by the Permaculture approach and is a boon for smallholder farmers, assuring food, nutrition, and cash requirements. It is a climate-smart model through an organic approach. It sustains both in rainfed and irrigated conditions. It has effectively addressed a family's social and economic challenges, reduced distress migration, created economic opportunities through convergence platforms like MGNREGS, and built the farming communities' confidence. This model categorically addresses the three major needs: Family, Farm, and Market.

Faguram Muduli, aged 42, is a leading Adarsh Bagicha farmer from Poibeda village in Guneipada GP of Lamtaput Block. He shares, "Once my 2 acres of land used to lay barren for most the year other than Kharif season; however, now I can harvest regularly throughout the year from this patch of land after adopting the Adarsha Bagicha." On average, he earns Rupees one lakh from his two acres of land after addressing his family's consumption needs and distributing the farm produce among his relatives.



Plate-1: Faguram Muduli in his Adarsha Bagicha

Faguram Muduli owns four acres of land where he used to grow mainly Finger Millet, Foxtail millet, and Paddy through traditional practices that helped him to earn a meagre income to support his family. The land used to remain uncultivated during the summer season. He would migrate to nearby towns for work in the lean periods of the month.

Life took a positive turn for Faguram in 2010 when he joined a training program on Adarsha Bagicha (AB) organized by the Asha Kiran Society (AKS). After receiving technical support and plant saplings from AKS, he decided to dedicate two acres of his sloppy rainfed land for the AB model. In the first year, he received a good harvest with the increased crop yield of Paddy, Finger Millet, and vegetables. Now Faguramam cultivates 35 to 45 types of fruit, tuber, pulses, millets, and vegetable crops in his land using organic manures. He is proud and happy to be recognized as a successful farmer.

Like Faguram Muduli, the Asha Kiran Society successfully demonstrated this model with 443 smallholder tribal farmers in the Lamtaput block of Koraput district.

Agricultural Context of Lamtaput Block:

Farming is riskier in rainfed areas like Lamtaput block due to high dependency on uncertain rainfall. Surface and groundwater-based irrigation approaches are challenging options for the sloppy hilly terrains of the Lamtaput block. The average landholding of farmers in the Lamtaput block ranges from 2 to 2.5 acres; 70 percent of land comes under the upland and medium land category. Farmers receive a maximum yield of 3-4 quintals of paddy from one acre of uplands. For this reason, there has been a trend to move away from agriculture and to go for commercial plantations like Eucalyptus in uplands and medium lands to earn an income by selling it to paper mills.

AKS has developed AB model to make farming sustainable and profitable on these slopy uplands for smallholders. This model incorporates innovative practices like rainwater harvesting, soil-moisture conservation, and a combination of agriculture and horticulture with agroforestry.

Evolution of this model:

When AKS started this model in 2009 with 28 farmers, it was nascent. During this stage, it had a boundary to protect the crops from stray animals and contour trenches inside the plot for soil and water conservation. Farmers used to plant both forestry and horticulture plants in the field randomly. Since the beginning of this model, the application of chemical inputs was prohibited. In 2015, the model was improved, where farmers were motivated to plant forestry plants in the upper half of the patch and horticulture plants in the lower half of the patch. In 2018, the final version of this model came into existence, and 443 farmers of Lamtaput block have adopted this model.

Description of the model conceived in 2018:

The AB model is farmer-centric. Each farmer has a contiguous plot of 0.75 to 2.5 acres of gradually sloppy land. This land area is selected based on the available working members in a family. Thus, in a village, one can find the AB model plots in contiguous patches or a scattered fashion based on the plot locations consented to by the farmers. However, this model is not a landscape treatment model but rather a farmer-centric one aiming at optimal production and assured income for families. The Adarsha Bagicha model is primarily suitable for the uplands and medium lands, having a preferred slope of 2-5%.

A typical one-acre AB model is divided into **four sections** and has the following additional components and features-

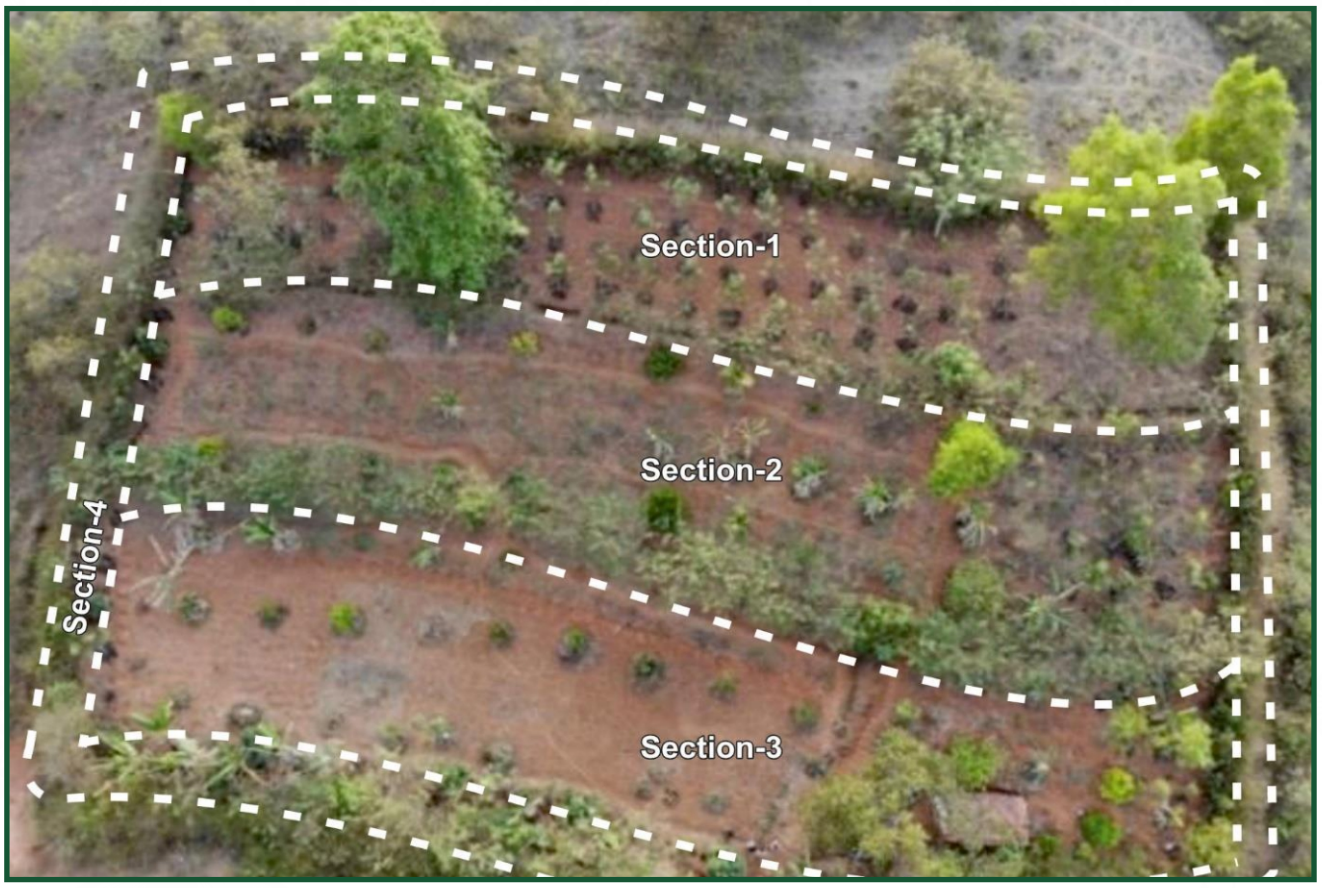


Plate 2: Ariel View of Adarsha Bagicha

Photo Credit: Asha Kiran Society

Section-1 With Forest plantation (upper 30% section):

With 30% of the area, the upper section of the plot is covered by forest and medicinal plants (about 126 numbers) with a crop geometry of 3m x 3m. The major plant species used in this area are Silver Oak and Australian Teak (*Acacia mangium*); after four years of growth, this tree can provide shade to the Coffee plantation and support Black Pepper vines. The return from Coffee and Black pepper is a constant source of income for the farmers from this patch of land in the long run. The inner space of the slope is utilized for growing shade-loving plants like Long Pepper, Ginger, and Turmeric crops. Three years after plantation-Coffee saplings are planted, followed by Black Pepper in the 4th year.

Section-2 With Horticultural plantation (middle 30% section):

The middle strip, comprising 30% of the land area, is utilized for horticultural plantation crops (about 52 nos). This portion of land is divided into two parts, and fruit tree species like Mango, Litchi, and Sapota at 3m x 3m, with Kagzi Lime, Guava, Papaya, Custard Apple, etc., as interplant grown throughout the patch. The inner space among fruit tree saplings is utilized for shade-loving plants like Long Pepper, Ginger, Turmeric, and seasonal vegetables. These plants are continually raised until the fruit plants grow substantially.

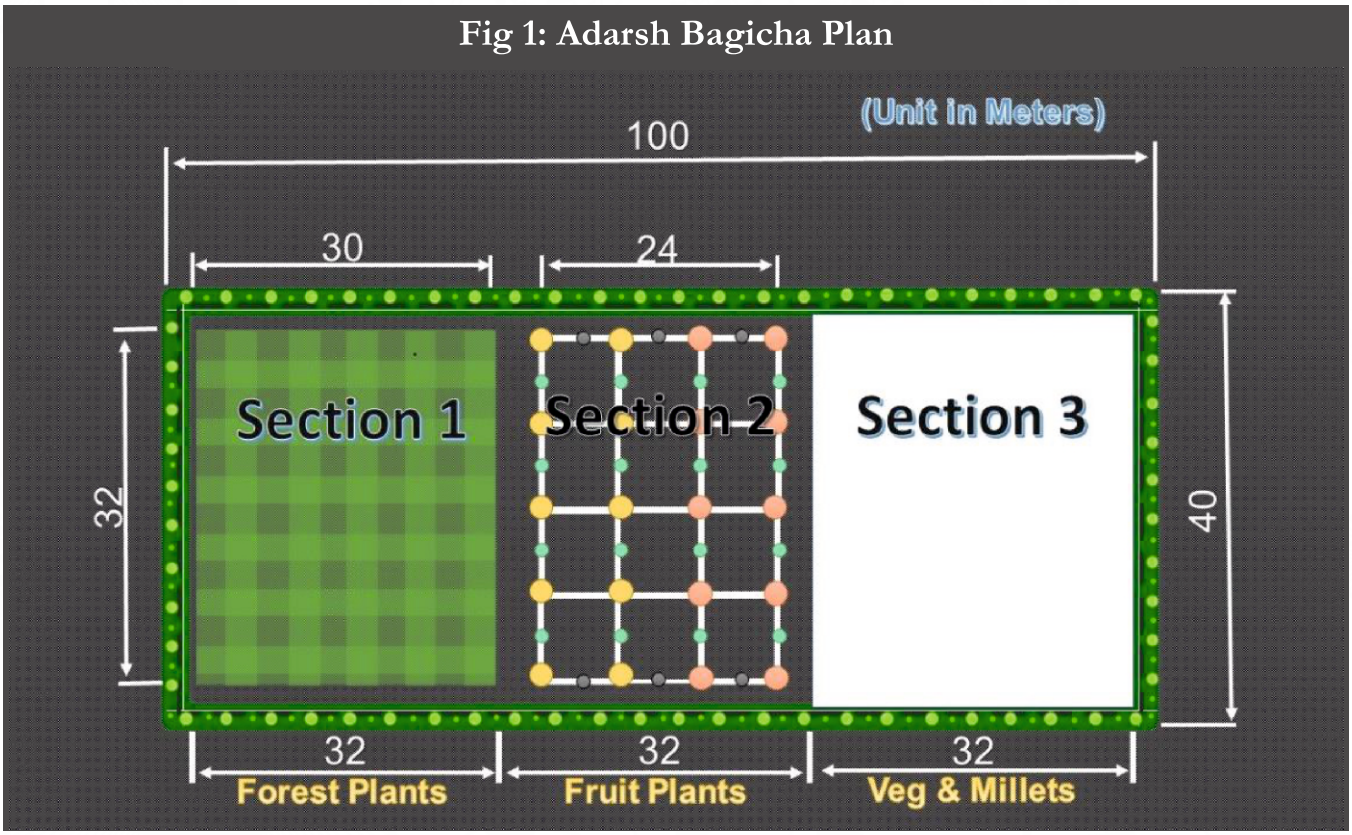
Section-3 With Millet and vegetables (lower 30% section):

The lower section, which is again 30% of the total area, is utilized to cultivate millets and other Vegetables to meet the day-to-day requirement of the farmer.

Section-4 With Peripheral plantation (10% of land):

The boundary zone consisting of 10% of the total area is utilized to grow forest plants like Silver oak, Acacia mangium, and Jafra (*Bixa orellana*) with a crop geometry of 2m x 2m to grow Black Pepper after four years; In the second year, pineapples are grown in the interspace to get additional income.

Fig 1: Adarsh Bagicha Plan



Along with the above major partitions in the AB model, the following features exist in the model .

a) **Boundary fencing-** The model requires a sturdy boundary to prevent livestock and stray animals from feeding on the plants, preferably on all sides of the plot. The boundary can be either trench fenced with live fencing or stone fencing, depending upon the availability of material and the farmers' choice.

b) **Bio-manures and bio-pesticides instead of chemical fertilizers & pesticides include** compost pits, vermiculture, and Jeevan Pani. All three are meant for adequate nutrient supplements for plants. Farmers are also encouraged to construct a vermicompost pit in the field. Bio-pesticides such as Fish tonic, different kinds of Bio-sprays, and Bio-Pest Repellents from locally available materials are used for disease and pest management. For this, urine collection pits at the cattle sheds are promoted to collect cow urine. Both cow urine and cattle dung are made available to prepare manure, bio-fertilizer, and bio-pesticides at the plantation areas.

c) **Integrated soil and water conservation:** It includes creating boundary walls through stone-bunding/deep trenches and contour bund/trenches within the field; Gliricidia is planted on bunds, along with rainwater harvesting pits and forest saplings planted along the boundary.

d) **Afforestation through Agroforestry-** Multiple tree species, including Silver Oak trees, support Black Pepper vines and shade for Coffee plantations. Fruit trees are grown for family consumption and surplus sale in the market. Boundary trees reduce wind erosion and give an additional economic return.

e) **Multi-cropping permaculture -** This model helps in the long-term establishment of agroforestry plants for a steady cash income. The Companion crops sown in between saplings during the initial years make maximum use of the land and provide immediate returns for the farmers. Additionally, vegetables, spices, millets, pulses, and oilseed crops are grown to provide value-added income and better food diversity for the farmer's family.

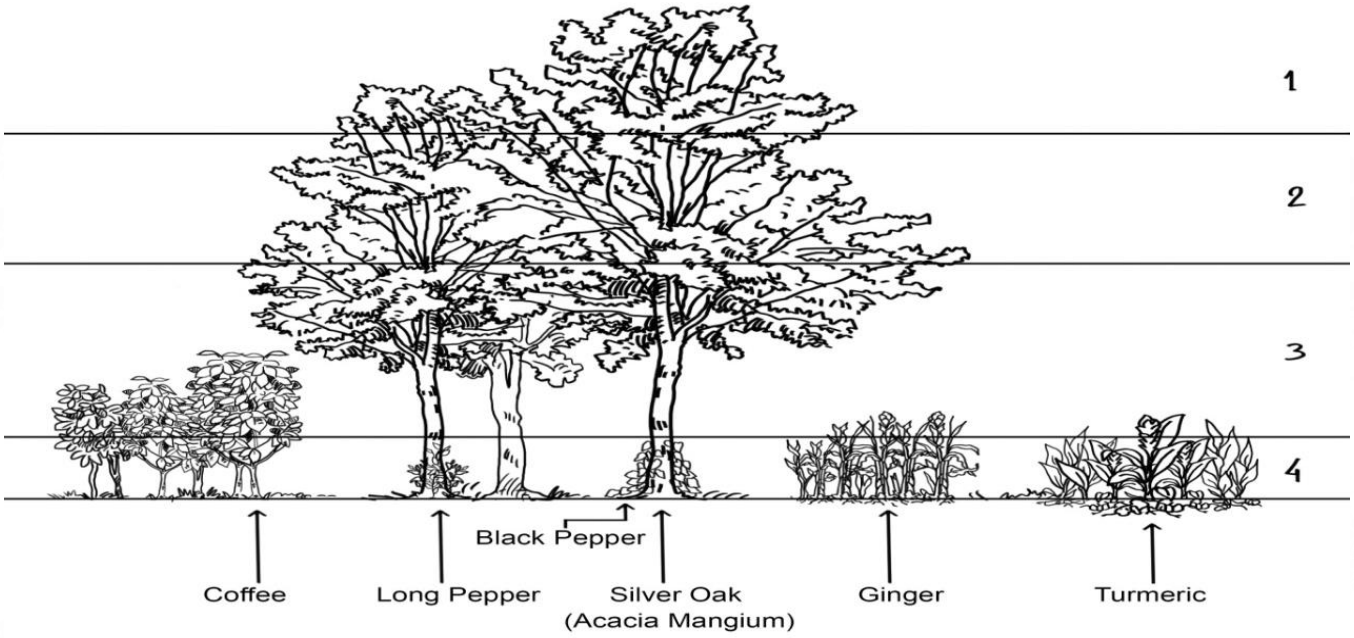


Plate-3: A farmer in his Adarsha Bagicha

Photo Credit: Sankarsan Behera, PRADAN

Fig 2- Adarsh Bagicha with different plants

curated by PRADAN



Strategy:

Before 2018 only 83 farmers had adopted this model, and looking at this successful model, the district administration decided to support the farmers who were willing to adopt this model through MGNREGA. After 2018, all the farmers who have taken up this model have received support under MGNREGA.

Implementation arrangement of Adarsha Bagicha under MGNREGS:

The AB model provides an excellent opportunity for converging various government schemes to unlock the land value of the farmers. It utilizes existing schemes in the MGNREGA handbook and applies them to a single plot of land. Multiple departments are involved with the Department of Horticulture to operationalize this model. During the uncertainties of the COVID-19 pandemic, this model had a vital contribution to the farmers' families by providing regular income. **Adarsha Bagicha model received National Award for Koraput District in 2019 for the best innovations in MGNREGA.**

Benefits of convergence scheme:

- Farmers receive labour benefits for upgrading and nurturing their land!
- Long-lasting investments are made to improve the land quality, which further helps the farming community to have a productive asset for generations

The implementation of Adarsha Bagicha has two major components. Physical performance through MGNREGS and capacity building of farmers in convergence with ATMA. The steps involved in physical implementation are as below:

- Selection of small and marginal farmers as beneficiaries by the Nodal NGOs
- Submission of beneficiary farmers' list to the DDH/PD Watershed of the district
- Identification of Adarsha Bagicha Sathi (AB Sathi, who caters to 20 acres) by the Nodal NGO and getting the same approval by the Gram Sabha.
- AB Sathi collects land records, Aadhaar cards, Job card numbers and mobilizes farmers.

- Feasibility report and submission of a proposal by the block level officers (AHO/ASCO) and respective implementing agency to the concerned district authorities for approval by the District Collector and Project Director of DRDA.
- After approval, the detailed estimate by implementing agency for Technical and Financial sanction is ensured.
- Work order is released under the name of AB Sathi.
- AB Sathi carries out labour demand consolidation, work initiation, and submission of muster roll etc..

The implementing agency ensures procurement of approved inputs like saplings, organic manure, and construction materials for vermicompost for distribution by AB Sathi to the farmers. The implementing organization monitors work progress, and monthly reports are submitted to the concerned Block & District officials.

Criteria for selection of farmers:

- ✓ An agreement is signed between AKS & Farmer that the farmer will never use chemical inputs in the farm.
- ✓ The farmer is responsible for completing the fencing work and contour trenches.
- ✓ The minimum plot size is 0.8 acres.
- ✓ Family should have enough human resources to carry out the activities

Once the beneficiary is identified, AKS helps the farmer design layout for the plantation. After that, farmers are suggested to apply compost in the entire patch of land before the plantation work.

The estimated cost for 1-acre AB under MGNREGS is Rs. 2,65,000 spread over five years, the labour component being Rs 1,66,020 (62.60%) and the material part is Rs 98,980 (37.40%). The DRDA, Koraput, has sanctioned 500 acres or units for AB model at an estimated cost of Rs 1325 lakhs for five years.

Income Analysis from AB model

Income data of 10 AB farmers for the financial year 2022-23 was collected.

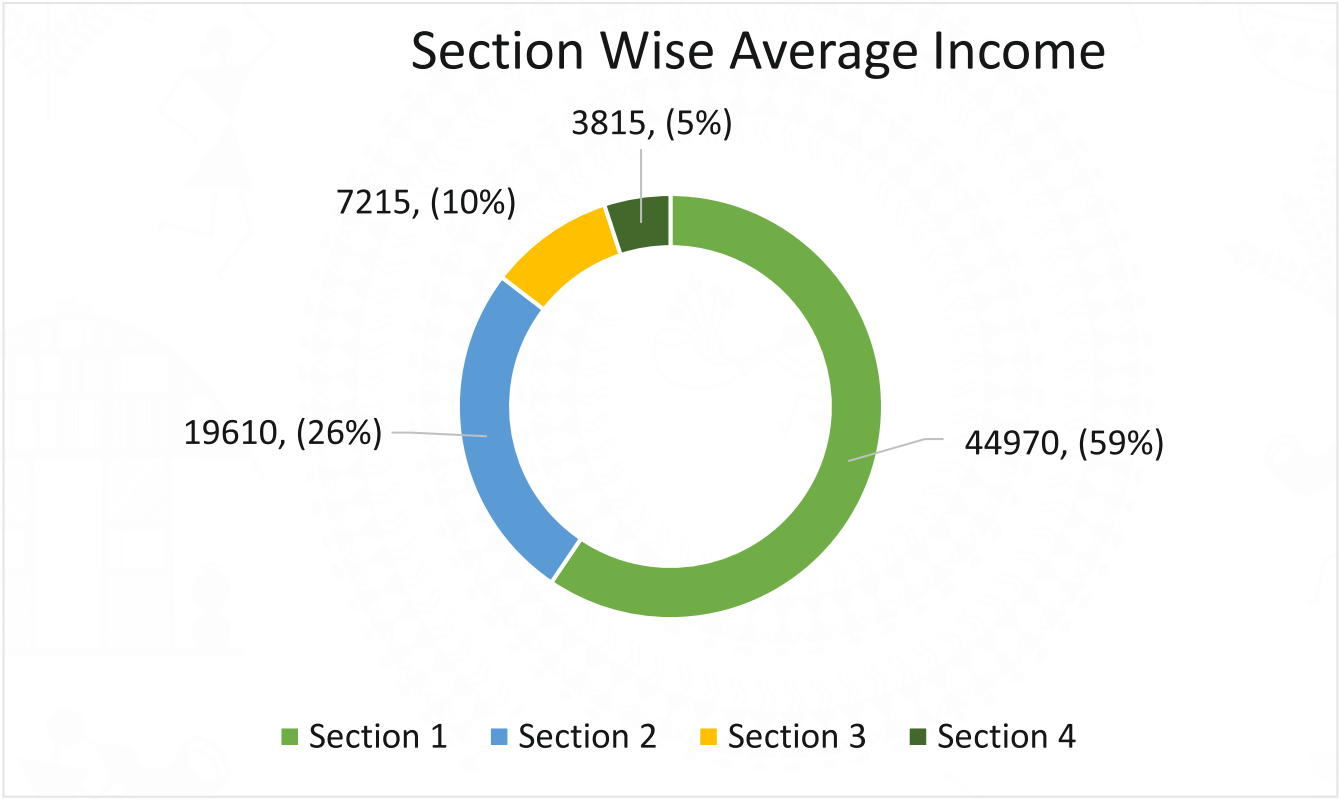
Table-1 provides the individual income of 10 Adarsa Bagicha farmers.

SN	Name of the farmer	Area in Decimal	Income from Section -1(in rupees)	Income from Section -2(in rupees)	Income from Section -3(in rupees)	Income from Section-4(in rupees)	Total Income
1	Gadua Muduli	100	—	5500	8000	2000	15500
2	Mangala Muduli	200	97200	33500	9800	2500	143000
3	Dana Pangi	150	13500	15000	6300	2000	36800
4	Bagu Muduli	200	42000	3900	3000	25000	73900
5	Guru Muduli	200	56000	17800	8750	850	83400
6	Genua Khada	100	93000	36200	0	3000	132200
7	Gope Khilo	200	15000	18800	13500	600	47900
8	Loichan Munda gadia	150	34000	13400	7800	200	55400
9	Chandrasen Muduli	150	43000	46000	15000	1000	105000
10	Faguram Muduli	200	56000	6000	—	1000	63000
						Total Income	7,56,100
						Average Income	75,610

Data Source: Primary data collected by Sankarsan Behera, PRADAN

The table-1 shows that the average individual income from AB is Rs. 75,610. Mangala Muduli has earned the highest income among all the farmers, which amounts to Rs. 1,43,000. On the other hand, Gauda Muduli earned the lowest individual income of Rs. 15,500. If we compare both data sets, it suggests that Gauda Muduli did not earn any income from section 1, whereas Mangala Muduli earned Rs. 97,200, accounting for 67% of their total income. While collecting data, Gauda Muduli mentioned that he couldn't grow ginger and turmeric as he fell ill during the sowing season. After discussion with farmers, it was found that ginger and turmeric cultivation remain the most significant contributors to the income bucket on the third year of intervention.

Figure-3



Data Source: Primary data collected by
Sankarsan Behera, PRADAN

The graph in figure-3 shows the distribution of average income in different sections. The graph shows that Section 1 is the largest contributor to the average income, accounting for 59% of the total average income, which amounts to Rs. 44,970. Section-4 is the least contributor to the average income, accounting for 5%, which amounts to Rs.3815. Farmers harvest most of the earnings from section-1 in the third year by selling ginger and turmeric. At the same time, they earn the second highest income by selling bananas from section 2, along with other fruit plants and vegetables.

Issues and Constraints:

- At the outset, it can be said that the model is not for low land holding marginal farmers as a patch of land having the size of one acre and initial investment for fencing and contour trench construction is needed.
- The initial two years are an uphill task for the farmer, who has to dedicate most of the time in the AB field. If the family don't have adequate personpower, it becomes difficult.
- Open grazing is a concern, especially in those villages where only one or two farmers have opted for this model.
- As the model has been intertwined with MGNREGA funds, untimely disbursement of MGNREGA funds creates hurdles for the farmer.

Output:

- AB is a long-term asset creation by using the MGNREGA fund
- Organic farming is at the core of this model, ensuring toxin-free vegetables and fruits for households and others.
- On average, one household can earn Rs. 70,000 per annum by selling the produce from AB.
- The soil quality has increased through soil and water conservation measures.

Outcome:

- AB provides food, fodder, and nutrition required for a household around the year.
- It is a climate-resilient intervention that helps farmers grow various crops without an irrigation facility.
- People are happy as they get fresh and chemical-free fruits and vegetables throughout the year.
- Higher crop diversity means significant risk reduction
- More crop varieties harvested ensure greater food security for farmers' families.

Way Forward:

- The model can be scaled up among small and medium farmers, including CFR beneficiaries.
- Enhancing participatory monitoring systems for better efficiency and more returns for farmers
- Ensuring a proper mechanism in the MGNREGA cell for timely fund disbursement for effective implementation.
- Developing robust community institutions (FPO/CBO) to ensure AB farmers' forward and backward linkage and capacity building. This will help farmers to get a competitive price for their produce.

TRANSFORMING LIVES THROUGH TASAR SERICULTURE IN BANSPAL BLOCK

A model devloped by PRADAN

Context

Banspal block of Kendujhar district has 51% forest cover and a predominantly tribal population of 79%. Most of the communities in forest fringes depend on selling firewood, collecting Non-Timber Forest Products (NTFPs), wage labour, and short-term migration for livelihoods. Subsistence rice-based agriculture is practised; however, it is vulnerable to elephant attacks, rain uncertainties, increasing risks of failure and uncertain returns. Tasar sericulture has been a traditional livelihood for tribal communities in this region since time immemorial. The region has the right agro-climatic conditions and host plants suitable for Tasar rearing. Keonjhar and Mayurbhanj have the 2nd highest number of rearers in the country after Jharkhand.

Odisha has been the only state where the Government has made essential systematic efforts to promote Tasar Rearers Cooperative Societies (TRCS) to strengthen producers' livelihoods across the value chain. This initiative was undertaken almost 50 years ago, focusing on bringing all the producers within the folds of cooperatives. The Cooperatives took responsibility for organizing an efficient supply of Diseases Free Layings (DFLs) and providing extension services. Also, It purchases the bulk of the cocoons from the rearers at fair market prices. The available Government subsidies for setting up infrastructure, conducting training, and product promotion were also routed through the cooperatives. The Government also intervened to bring affirmative changes in the policies to prevent the sale or dispatch of cocoons outside the state to ensure an adequate supply of cocoons as raw materials to the reelers, spinners and weavers at a fair price.

Although Tasar rearing was a traditional activity in the region and Producer Cooperatives (TRCS) already existed; however, the availability of quality DFLs gradually became a vital bottleneck to the successful production of cocoons. TRCS could only produce limited volumes of DFLs and had to outsource them from other stations outside Odisha or Central Silk Board (CSB). The rearers also became dependent on wild cocoons for layings which further increased risks and uncertainties. In the absence of prophylactic measures to protect the silkworms, entire crops used to get destroyed. Several rearers also sold off their produce to opportunistic middlemen for immediate cash benefits, thus affecting central procurement through TRCS.

Under the Mahila Kisan Sashaktikaran Pariyojana (MKSP), the "Promotion of Large scale Tasar sericulture-based livelihoods" project was initiated in Banspal block between 2014 and 19. Several interventions were facilitated by Tasar Development Foundation (TDF), an entity promoted by PRADAN, to strengthen Tasar-based Livelihoods. Currently, 800 rearers are involved in Tasar livelihoods in the block supported by TDF which works in the Tasar silk value chain and implementation of development projects.

Features of the Intervention

Daba Bi-Voltine (BV) ecorace of Tasar is principally reared in the region on Asan (Terminalia tomentosa) trees in Protected Forests. Every rearer has a designated hereditary patch in the forest abounding with 150 to 300 Asan trees where rearing of the silkworms is carried out. The host trees are extensively pollarded to facilitate rearing. Traditionally good quality cocoons were collected from the forests in June and hung inside the house till the moths emerged and coupled. The female moths were separated and kept in leaf receptacles for egg laying; after 9 days, as the eggs hatched, the young worms were brushed on the leaves of the host trees. Sticky traps and slingshots were used to catch or scare away the birds and insects. When the worms ate away all the leaves of one tree; they were transferred to another tree or several trees and continued till all the cocoons were formed; finally, after they matured, they were harvested for sale in haats (weekly markets).

PRADAN, through TDF, initiated improved Tasar rearing practices in the area by ensuring quality DFLs produced centrally through community institutions along with indoor hatching, rearing under nylon net at a younger stage of the worms to ward off predators along with prophylactic measures for disease management in the rearing fields. The project has been able to raise the income of Tasar rearers from uncertainty to a stable Rs 18,000-20,000 annually; the average cocoon collection in TRCS has also increased from 200 Kahans to 3,000 Kahans between FY 2014 to 2020.

Key Features of the Program

Providing quality DFLs to the rearers at doorstep through community led Seed Production Units.

Equipping rearers with skill, accessories & implements for improved rearing.

Host tree plantations for scaling up the activity

Developing a pool for Community Resource Persons for providing services and ensuring quality in the villages.

Organizing the Tasar silkworm rearers as Producers' Groups for better planning and service delivery.

Establishing a functional linkage between the Producers' Groups and the TRCS for smooth marketing and availing social safety net benefits of the State Govt.

Promoting effective District or Block level Associations of Producer groups to strengthen the initiatives.

Steps in Interventions

1. Commercial Seed- Grainage:

Commercial Seed- Grainage is a community-managed Commercial DFL production system in the village to ensure the supply of quality DFLs that can cater to the needs of the rearers. About 30 to 35 Women Rearers are mobilized to form a Producer Group called Tasar Vikas Samiti (TVS) at their respective hamlets to plan, implement, and monitor Tasar rearing-based activities. TVS members have roles comprising 25 to 30 Commercial Rearers, 5 to 6 Seed Rearers and 3 to 5 Grainage Operators.



Plate-1: Commercial Seed Grainage.
Photo credit: TDF, Keonjhar

N.B - 1 Kahan is Equal to 1600 cocoons
1 Pana is equal to 80 cocoons

A typical Grainage (12 ft x 6 ft) of 30,000 cocoon capacity required investments of Rs 2.08 lakhs (as per the prices of FY 2016-17), including equipment, consumables and working capital of Rs 38,000; this was supported under the MKSP project.

There are two cycles of Tasar rearing- Seed Rearers do the first Seed Crop rearing from June to August. After the harvest of the seed, cocoons are sold to the Village Grainage Operators, who are engaged in Commercial Seed (DFLs) production. These DFLs are sold to the Commercial Rearers in September, and the second rearing cycle commences. The proceeds of DFL sale go to the TVS, who also sell the pierced cocoon of the Grainages to the TRCS.

The Grainage Operators pay the cost of Seed Cocoons, microscopist charges, labour wages, and the cost of consumables needed for Grainage work by collecting from the TVS. After clearing all the payments, the TVS provisions the balance amount as a reserve for Grainage repair, purchase of new implements etc. The TVS also acts as a village-level aggregator of commercial cocoons for sale to TRCS, thereby reducing the infiltration of petty traders.

Commercial Grainage ensures an ample supply of quality DFLs for all rearers in the village itself, as compared to earlier times when DFLs were produced externally. The current system ensures strict monitoring and quality control to ensure the success of Tasar Rearing.

Table 1 shows the Economics of Seed Cocoon Rearing-

Item	Nos & Rate	Amount -Rs
DFLs	200 DFLs @ Rs 14/DFL	2800
Slaked Lime		600
Bleaching Powder		350
Sodium Hypochlorite		600
Fertlisers	2100 plants @ 200 g/plant-420 kg @ Rs 36/kg	15120
Insecticides		750
Cultural Operations		1650
Total Cost		**21,870**
Seed Cocoons	10,000 @ Rs 4.5 per cocoon	45,000
Net Surplus		**23,130**

Table 2 shows the Economics of Commercial Grainage-

Item	Nos & Rate	Amount -Rs
Seed Cocoons	25,000 cocoons @ Rs 2.50/piece	62,500
Consumables	Lumpsum	5000
Grainage operations cost		18,750
Total Cost		**86,250**
DFLs	6250 @ Rs 14/DFL	87,500
Pierced Cocoon	25,000 @ Rs1 per piece	25,000
Gross Receipts		1,12,500
Net Surplus		**26,250**

2. Basic Seed Production Unit

Basic Seed Production Unit (BSPU) is a community-managed seed production facility that provides quality basic seed DFL to seed rearers in the first rearing cycle.

The Basic Seed cocoons for basic DFL production need to be preserved for more than six months; thus, a permanent infrastructure with facilities to maintain the required humidity and temperature is needed. Under the MKSP project- a BSPU was established at Khajurimundi village of Banspal block.



Plate-2 Basic Seed Production Unit
Photo credit: TDF, Keonjhar



Plate-3 Basic Seed Production Unit
Photo credit: TDF, Keonjhar

The BSPU consists of a two-storied pucca building having a hall (40 ft x 25 ft) surrounded by 8 feet verandah to accommodate 150,000 Basic Seed Cocoons on the ground floor along with separate rooms for Egg Laying, Incubation and Moth Testing on the first floor as well as all necessary equipment, accessories, consumables etc.

The BSPU required an investment of Rs 45,10,000 (2016-17), including the cost of building construction, equipment, consumables and Working Capital of Rs 3.1 lakhs and was supported under the MKSP program; currently, it is being managed by TDF.

To efficiently manage the BSPU and ensure the smooth functioning of all the Tasar Cocoon Rearing production nodes, all the TVS in the block federated to form an apex body -Radhakrishna Tasar Development Trust (RTDT). This body ensures the Basic seed DFL supply required by the TVSs during the Seed Crop cycle and bulk procurement of all the consumables and prophylactic agents for the Commercial Rearers. RTDT establishes and manages linkages with suppliers and other stakeholders to ensure the timely availability of all the materials. This apex body also trains the Microscopists of respective Grainages and Community Resource Persons involved in BSPU operations.

The body also identifies- Adopted Seed Crop Rearers (2nd Cycle) to ensure the supply of quality Seed Cocoons to the BSPU. The Adopted Rearers are provided with necessary rearing equipment and prophylactics for rearing 200 DFLs.

3. Improved Package of Practice of Tasar rearing:

To reduce or eliminate the risks in traditional Tasar Rearing- several improved practices and use of prophylactics were initiated under the MKSP project, namely-

- Application of fertilizers and insecticides to improve leaf quality
- Use of quality DFLs for rearing
- Indoor hatching of DFLs and brushing of hatched larva
- Brushing Site Preparation.
- Use of Nylon net for the rearing of early instar larva
- Dusting of lime & bleaching powder during the transfer of worms
- Spraying of Sodium Hypochlorite solution during rearing.
- Use Secateurs for pruning instead of sickles to ensure clean cuts and reduce possible infection of host trees.

Several training programs were organized, and necessary equipment and consumables were provided for Seed and Commercial Rearers under the MKSP program to ensure good understanding and compliance with the above steps to ensure good yields. Community Resource Persons at the village or cluster level are also equipped with the necessary know-how to monitor and address limitations or problems during rearing.

Table 3 shows the Economics of Commercial Tasar Rearing-

Items	Quantity	Amount-Rs
DFLs	150 nos	1800
Lime	20 kg	200
Bleaching Powder	2 kg	80
Sodium Hypochlorite	0.5 lit	63
Dusting Powder	2 kg	60
Jeevan Sudha	1 packet	100
Plant Maintenance	Lumpsum	500
Total Cost Incurred		2803
A Grade Cocoons	5760	18,720
B Grade Cocoons	1440	3600
Total Cash flow		22,320
Net Income		**19, 517**



Plate-4: Tasar worms transfer by a farmer

Results and Scaling Up

The MKSP project on Tasar Rearing significantly increased Cocoon production in the block from 200 kahans to 30,000 Kahans. It ensured cocoon aggregation through TVS at the village level, thus strengthening TRCS and State Sericulture Department. A dedicated technical agency TDF was also established to assist the village-level TVS in sustaining the intervention.

State Sericulture Department is implementing Tasar host tree plantation projects in Banspal and Harichandanpur blocks of Kendujhar district, which would further help expand Tasar rearing in the area.

TDF has taken up Tasar host tree plantation across 500 ha in Banspal block in the FY 2019-21 with the support of the District Mineral Fund (DMF) under the guidance of the District Sericulture Office, Kendujhar.

Dhaneswari Rana in Baragoda village was not new to Tasar activities since their forefathers were also doing this but had left Tasar cultivation for last 10-15 years due to uncertain production. When Tasar Development Foundation (TDF) called a meeting to discuss about Tasar rearing with the SHGs in her village, Dhaneswari attended the meeting and her family decided to take up rearing with the new methodologies. She took up training on the improved practices with the help of Community Resource Persons (CRPs) of MKSP project and she learned to use nylon net, prophylactics in her rearing field.



Plate-5: Dhaneswari Rana in her Tasar field
Photo credit: TDF, Keonjhar

In 2016-17, she got a good harvest in the first year itself and then she worked on the host tree management in her rearing field and has been having a good harvest each year. She bought one pair of bullocks from her earnings and in the following year she could purchase a bike.

Table C1 shows the Comparison of pre and post intervention in Tasar:

Parameters	Before intervention	After intervention
No. of DFLs reared	500 gm (equivalent to 250 DFL)	100-150 DFLs
Cost of DFL	Rs 1500 (@ Rs 600 per 200 gm)	Rs 1200
Use of prophylactics	No	Sodium Hypochlorite, Dusting, Lime and Bleaching, Jeevan Sudha
Cost of prophylactics	0	Rs 643
Cocoon harvest	3200	8215 (average of 4 years)
Earning from cocoon	RS 8000 to Rs 10000	Rs 23912 (average of 4 years)
Net profit	Rs 6500 to Rs 8500	Rs 30898 (in 2019-20)

Table C2 shows Year wise rearing details of Dhaneswari Rana from 2016-20

Year	No. of DFLs reared	No. of cocoons harvested	Cost realized from cocoon sale-Rs
2016-17	100	6965	20,029
2017-18	100	7860	22,309
2018-19	150	6818	19,858
2019-20	150	10560	33,452

Source: TDF, Keonjhar

Impact & Outcome

Radhakrushna Tasar Development Trust (RTDT) has been providing the required basic seed DFLs in Banspal block, and presently 800 rearers are taking up the Commercial Rearing through the DFLs produced from the Basic Seed DFLs supplied by the Producer Groups. The Trust sells more than half of its produce to the nearby blocks every year and supports cocoon production in those areas. The TRCSs of nearby blocks and nearby districts come to this Trust for the seed DFLs. This Trust is managing its operational expenses from its business operations. The community resource persons developed under the project are now nested and hosted under the RTDT. The Trust is engaging them as and when required to provide hand-holding support to the TVSs and its seed rearers, even to outside stakeholders who require such support (e.g.- it has sent its microscopists to the nearby blocks where OLM was implementing the MKSP Tasar project).

It is observed that producing Disease Free Seed Cocoons in the plantation patch of Arjuna and Asan is more effective as rearing can be taken up in more controlled conditions than in the forest. In forests, as such, there are some restrictions on pruning branches and disinfection by control firing in the ground, which are essential for the disinfection and management regime of seed crop rearing. Gradually it was realized that cocoons produced in the forest are not fit for preservation; hence, the seed cocoons are currently procured from other community institutions in Jharkhand and Bihar. Plantations have been carried out in Banspal block recently, which would be ready in another 2-3 years, then the RTDT and PGs would be self-sufficient for its seed cocoon requirement for Basic Seed DFL production.

The Project Implementing Agency PRADAN and TDF have invested more time to build good interconnectivity between the TVSs and the RTDT by conducting regular meetings of the TVSs representatives and the RTDT board. TDF imparted training and hand-holding of the Directors of RTDT on the financial and technological aspects of organizational processes. TDF also supported the RTDT in marketing its surplus DFLs at earlier stages by introducing it to the different stakeholders.

Innovation & Success Factors

The key factors to the program's success were addressing the critical need for high-quality DFLs and adopting improved rearing practices that reduced the risks and uncertainties caused by predators and diseases, thus increasing cocoon yield and enhancing income. Women who had traditionally been left out of Tasar rearing were in the lead and ensured strict monitoring and compliance of packages and practices. Motivated Community managed institutions from the hamlet to block level along with expertise from dedicated agency like TDF was the prime mover that provided equipment, consumables, training and all-around support on time for smooth operations, realization of fair price, and enhanced income.
Aggregating commercial cocoons at the village level by TVS also helped in the procurement of cocoons by TRCS, strengthening the Post Cocoon Value Chain.

The Way Forward

Tasar cultivation is a successful livelihood option for forest-dependent communities in Kendujhar, Mayurbhanj, Sundargarh and Jajpur districts of Odisha. Several projects along the lines of MKSP can be taken up with the support of DMF involving the State Sericulture Department and Integrated Tribal Development Agencies (ITDAs), and other stakeholders in the above four districts.

Laxmi Pradhan of Adal village also almost left Tasar rearing due to uncertain production from the eggs supplied by TRCS Banspal. In the year 2014 PRADAN intervened in her village under MKSP project and formed Tasar Vikas Samitis (TVS) of the SHG members who were having Tasar rearing fields. Laxmi is the member of Shivashankar TVS having 26 rearers.

Laxmi took up seed crop rearing by taking DFLs supplied by PRADAN under MKSP Project first in the year 2014-15 and since then she is continuously taking up the seed crop and commercial rearing. She has completed seed crop rearers training and learned all the nitty-gritties of the rearing process. She also attended training on Microscopy and Grainage thus able to support Grainage operations. Her additional income helped her to invest in vegetable and paddy cultivation increasing their production. Laxmi now guides other fellow villagers on how to use prophylactics and prepare chowki rearing sites. She invested the earnings in repairing her house and purchased a pair of bullock for cultivation; she has also started a saving plan under LIC as well as meeting the expenses of the education of her children.



Laxmi Pradhan Adala Village, Banspal

Table C3 shows: Year wise rearing details of Laxmi Pradhan for last six years:

Year	Basic Seed crop			Commercial crop			Total income-Rs
	No. of DFLs reared	No. of cocoons harvested	Cost realized from cocoon sale-Rs	No. of DFLs reared	No. of cocoons harvested	Cost realized from cocoon sale-Rs	
2015-16	100	5,200	6,350	100	2,180	5,956	12,306
2016-17	100	7,352	11,940	100	7,400	21,528	33,468
2017-18	100	4,892	8,184	100	4,503	11,457	19,641
2018-19	100	5,136	8,146	100	3,216	9,533	17,679
2019-20	128	4,520	7,795	100	6,480	17,472	25,267
2020-21	120	5,060	9,630	150	5,824	15,916	25,546

Source: TDF, Keonjhar

CLAIMING AND CONSERVING FOREST UNDER COMMUNITY FOREST RIGHTS IN JAMUGUDA VILLAGE

A model devloped by
Jamuguda villagers & other CSOs

Context

Jamguda is a forest fringe village in Barbandha Gram Panchayat of M Rampur block in Kalahandi district of Odisha. It is situated 65 km away from the district headquarters of Bhawanipatna. Local communities refer to legends by which the village is estimated to be around 200 years old. It has 74 households with a population of 201 (Census, 2011), of which 90% belong to the Gond (Schedule Tribe-ST) community. The total geographical area of the village is 494 acres, with a forest area of 25%; the average land holding is 2.6 acres. The principal livelihoods of the community are Agriculture, Animal Husbandry and Collection of Non-Timber Forest Produce (NTFPs).

Forests as embedded in life and livelihoods

Before independence, the forests were privately held by a local Chieftain, and the Gaontia had jurisdiction over the forest on behalf of the chief. After 1947, the forests came under the control of the Forest Department, and villagers were restricted to access and use. The villagers were hurt to see the depleted condition of the forest; for them, the forest had always been an integral part of their lives; their life and livelihoods were embedded with the forest. They also revered the forest as sacred and worshipped her. Despite this strong association and dependency, the villagers had no role in the management and conservation of the forests and had simply NTFP collection rights.

Stakeholder and Partnership

Jamuguda was the 2nd village in India to receive the Community Forest Rights (CFR) after the Menda Lekha village of Maharashtra. Several actors, from Civil Society Organizations (CSOs) to political activists, have made it possible. Seba Jagat and Odisha Jungle Mancha contributed significantly to community mobilization and facilitated the claim-making process of CFR in the village. A Forest Rights Committee was constituted in 2008 with the effort of Seba Jagat, and Jamuguda got CFR rights in 2010. The community had claimed about 500 acres of forest land that comprised both Reserve and Village Forest; however, they received only 123.5 acres (~25%) of forest land under CFR, which comprised only the village forest. A brief schema along with this article has been annexed (annexure-1)for a better understanding of the CFR and CFR claim-making process.

Many CSOs extended technical support to the villagers after they received the CFR title; at different phases, Seba Jagat, Vasundhara, and Foundation for Ecological Security (FES) continued to support them in different capacities. FES has provided technical support to Gramsabha on the management and protection of Community Forest Resources and organized an exposure visit of villagers to Mendha Lekha .

After the formation of the Forest Management Committee, Gramsabha wanted to harvest bamboo from their CFR area to sell in the market. However, the Forest Department was reluctant to provide Transit Permit (TP); only after sustained engagement including detailed deliberations on the provisions of CFR the Gramsabha received the transit permit.

Interventions

CFR Claim making

Odisha Jungle Mancha and Seba Jagat mobilized the villagers to request Sarpanch to circulate a notice to all the villagers to attend a meeting to discuss the FRA. On the meeting day, Gramsabha selected some of its members as the Forest Rights Committee (FRC) members.

With Gramsabha's help, FRC prepared social and resource maps to demarcate the Community Forest area. In 2008, Jamuguda Gramsabha applied at the Sub Divisional Level Committee -SDLC for Community Forest Rights on 500 acres of forest area. After receiving the CFR title for 123.5 acres in 2010, the Forest Management Committee (FMC) was formed. They assessed that plenty of Bamboo was ready to harvest and decided to go ahead with the harvest.

Continuity of Gramsabha for a decade

The villagers' belief in the collective wisdom and Gandhian principle of Trusteeship has been reflected in the continuity of the Gramsabha for more than a decade. Each woman and man in the village is obligated to protect the forest and overall biodiversity. They have an intrinsic relationship with the forest and feel that the forest is a part of their socio-cultural and economic life. This philosophy of life has been transmitted from generation to generation. The village elders used to play more than their due roles to educate the new generation on their relationship with the forest and their moral obligation to protect it. They usually sit once a month and more than once whenever there is any urgency. They are always happy to welcome visitors to their village and share their experiences of protecting the forest. Even though some of the meetings are not adequately documented, they have an adequate understanding of decisions taken among themselves. Women further strengthen the Gramsabha by participating in Gramsabha meetings and following up on specific action plans in their SHG meetings. Typically, SHG members meet 3-4 times in their regular SHG meetings in a month and share their experiences of activities related to livelihoods and forest protection. The Gramsabha prepares a forest protection plan that focuses on every villager to be vigilant so that outsiders can never cut their forest; also, there is no forest fire in the summer. Other conservation plans like earthing up plants, pruning of tendu plants and gap plantation during the rainy season through mass mobilization.

a. The Gramsabha members express their views in meetings
b. Many persons in the Gramsabha are articulating about the incidences and process of Bamboo selling.
c. Unity in the Gramsabha is there and most of the decisions are taken in the Gramsabha itself.
d. The members say most of the disputes in the village are resolved in the village by active involvement of Gramsabha.
e. Women members, even old women above 60 and 70 years of age are also articulating the process of asserting forest rights and how Gramsabha can unitedly continue to work
f. Gramsabha is protecting the forest from forest fire since more than a decade
g. Gramsabha has put sign boards at some of the entrance points to the village as well as marked the landmark points on the Traditional Boundary.
h. It is striking to know that at Jamuguda village both Tribal and Other Traditional Forest Dwelling (OTFD) communities equally participate in taking decisions as well as protection and management of the Community Forest Resources.



Plate 1: Gramsabha Meeting

Photo Credit: Hrudayananda Mohapatra, PRADAN

The Gramsabha has sold Bamboo 2 times with a total sale value of about 8 – 10 lakhs. The benefit-sharing system from Bamboo is that the members involved in the Bamboo harvest will take 50%, and the rest of the 50% will be divided into two parts; 25% will be used for forest protection and management, and another 25% will be kept in Gramsabha for development activities in the village. About Rs. 2 lakhs is now available with the Gramsabha, and they are using it for interest-free loans for medical, education and marriage expenditures of girls from low-income families of the village. The Gramsabha has taken a unanimous decision that no interested students in the village will be deprived of higher education due to financial problems so far as Gramsabha has a monetary balance with it

Sustainable harvest of Bamboo:

1	Rotational harvesting is practised by dividing the whole forest area into 4 - 5 patches
2	Harvesting is practised from one patch only in a year, leaving all youth plants un-harvested. Only matured plants, recognized through colour bands, are selected for harvest
3	Dead and dry plants are cleaned to minimize the effect of forest fire, if any.
4	Harvest is avoided in the rainy season when new shoots emerge
5	In some of the sloppy areas, "U" shaped rings with dry stones are made to protect soil erosion and ensure more production

The villagers know the utilities of non-timber forest produce which they collect from the forest. They collect leaves, fodder, fruits, tubers, mushrooms, herbs, and firewood from the forest. They also discuss the trend of production and availability of various products and discuss sustainable harvest and conservation plans. Normally earthing up a young plant in the rainy season is commonly practised. Harvesting of fruits etc. done when they are ripe so that seeds and tubes are available in the forest for regeneration. They have consolidated the usefulness of various forest products.



Plate-2 Visitors visingng Bamboo fields
Photo Credit:
Hrudayananda Mohapatra, PRADAN

Useful Forest Produce:

Local Name	Scientific Name	Uses
Aonla	*Phyllantus emblica*	Fruit edible
Barhal	*Artocarpus lacucha*	Fruit edible
Bahera	*Terminalia bellirica*	Fruit
Bel	*Aegle marmelos*	Leaves used for Puja, edible fruits
Beeja	*Pterocarpus marsupium*	Furniture
Bamboo	*Dendrocalamus strictus*	House construction, roofing, handicrafts and for paper mills
Bhuineem	*Andrographis paniculata*	To treat thyroid and malaria
Chironji	*Buchanania lanjan*	Edible seeds
Imli	*Tamarindus indica*	Edible fruit, prickle
Jackfruit	*Artocarpus heterophyllus*	Edible fruit
Kurai	*Holarrhena antidysentrica*	Fruit edible, treating the gastric disorder
Lajkuli	*Mimosa pudica*	Treating milching cattle
Mango	*Mangifera indica*	Edible fruit
Mohua	*Madhuca indica*	Edible flowers, liquor
Shahaj	*Terminalia elliptica*	House repair
Sal	*Shorea robusta*	Plough
Teak	*Techtona grandis*	Plough
Tendu	*Diospyros melanoxylon*	Edible fruits and leaves for selling purposes
Van Tulsi	*Ocimum gratissimum*	Aromatic oil, treating fungal infections

Source: Primary data collected from the field by Dolagobinda Panda, PRADAN

Impact and Outcome

With the allocation of CFR title, Gramsabha is in charge of the regeneration, conservation, and management of their Community Forest, which has resulted in the following benefits and outcomes-

- Tree Felling is now prohibited in the Community Forest.
- Gramsabha assigns a role for every household to check forest fires, carry out pruning of Kendu trees before leaf picking, and participate in Bamboo and other sapling transplantation and maintenance.
- Increase in forest cover and wildlife through regeneration and sustainable harvest protocols.

- Several streams have got rejuvenated after forest protection.
- Gramsabha procured Kendu leaves from the collectors and directly sold them to factories resulting in higher rates for Kendu leaves from Rs 1.20/keri earlier to Rs 4/keri(1 keri is a bundle of 25 Kendu leaves).
- Each family, on average, can earn Rs 25,000 through NTFP collection.
- Families collect several tubers, mushrooms, Mahua, Kendu fruits, mangoes, and different berries and do not depend much on the market for fruits and vegetables.
- Every alternate year, Gramsabha sells Bamboo worth Rs 4,00,000 per annum and distributes 50% to the bamboo cutters from the village while keeping aside 25% for forest management and the remaining 25% in Common Fund to assist needy families with health and education needs.
- The animals are also healthier due to adequate fodder available from the forests.
- Land productivity has increased in the last decade, mainly due to the deposition of biomass and humus on their low land. Families can harvest 18-20 quintals of paddy/ac from lowlands without chemical fertilizer application.
- As a part of their forest conservation works, the villagers use indigenous seeds for cultivation and carry out mixed farming.
- The Gramsabha can now ensure access to Government welfare schemes like PDS, pension, MGNREGA, health and education services etc., better than when they were not organized.
- Several persons from different parts of the state & India visit Jamuguda to understand their unique achievement in managing the forests sustainably.
- Villagers say their cattle are getting sufficient fodder from the forest compared to ten years back.

Scale up

Odisha is a pioneer state for claim settlement under FRA. As per the MPR by MoTA, by 30th November 2022, claims applied under IFR are 6,29,913 and under CFR is 15430 and corresponding titles distributed are 1,65,032 and 7706. The extent of Forest land for which titles are distributed is 1013458 acres adding forest land under IFR and CFR together.

Since time immemorial tribal and other traditional forest dwellers communities have been protecting the forest and its rich bio-diversity. As climate change is a global concern now protection and conservation of forests by forest dwellers is much more realized. Forest conservation is an intergenerational culture that has been evident from Jamuguda. Once the forest is conserved, there is increased productivity of land, more fodder for domestic animals and rejuvenation of seasonal streams, hence people's livelihood is assured.

Dept of Forest & Climate Change, Revenue and Disaster Management, ST & SC Development, Minorities and Backward Classes Welfare Dept are working in tandem for CFR and IFR claim settlement process. As the community is on the front role in the claim-making process, further process simplification and development of a convergence framework for resource rejuvenation may be expected from CSOs having long years of experience in forest resource management .

Case study



Harishchandra Patra has 2 acres of agriculture land where he grows paddy. Other than paddy farming, he is also engaged in Goat rearing as there is plenty of grazing area in the village. Before CFR allocation, he was unable to collect and sell NTFPs like Bamboo, Mahua, and Kendu leaves. He could harvest only 10 quintals of paddy per acre, that could not meet his family consumption needs. Goat rearing was the only source of liquid cash for him in the time of emergency.

Once the community received the CFR title, then things changed and opened up new windows of income opportunity for the community. Harishchandra now earns Rs. 25,000 from selling NTFPs such as Mahua flowers, Bamboo and Kendu patta.

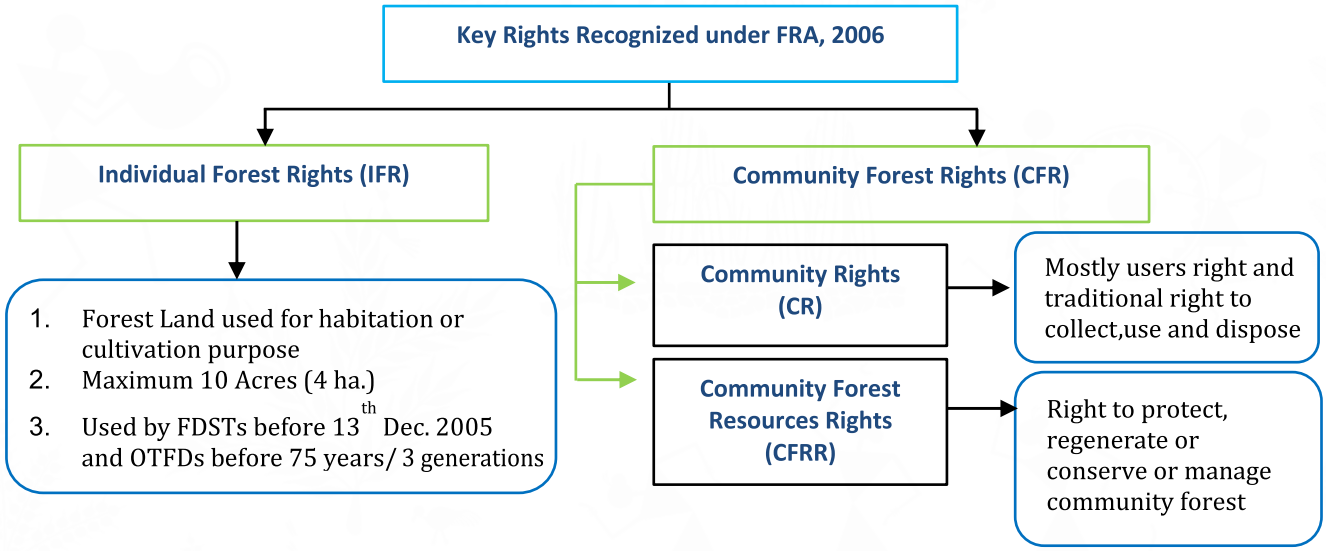
ANNEXURE:1

FRA – 2006

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act – 2006 shortly known as the Forest Rights Act (FRA) is a progressive Act that has been enacted to address the historical injustice against the Tribal and other traditional forest dwelling communities.

- The Act was passed in Parliament on 18/12/2006.
- Received the assent of the President on 29/12/2006.
- A draft of the Rule published on 19/06/2007
- Rule to implement the Act Published in the Gazette of India on 01/01/2008.
- Implementation of the Rule started on 01/01/2008
- The Ministry of Tribal Affairs made selected amendments to the Rule through a notification on 06/09/2012

The Act recognize and vest forest rights and occupation in forest land in forest dwelling Schedule Tribes and Other Traditional Forest Dwellers (OTFDs) who have been residing in such forest for years and whose rights could not be recorded. Besides, the Act has also emphasized the responsibilities and authority for sustainable use, conservation of biodiversity and maintenance of ecological balance and thereby strengthening the conservation regime of the forests while ensuring livelihood and food security of the forest-dwelling Schedule Tribes and other traditional forest dwellers.



Section	Community Rights (CR) under CFR
3.1 (b)	Community rights such as **"Nistar"** (including those used in erstwhile princely states, Zamindari or such intermediary regimes)
3.1 (c)	Right of Ownership, **Access to collect, use and dispose of MFPs** traditionally collected within or outside traditional boundaries
3.1 (d)	Uses or Entitlements (**Fish & other products of Water Bodies**)
	Grazing (both settled and transhumant)
	Traditional seasonal **resource access for nomadic and pastoralist communi**ties
3.1 (e)	Rights including community **tenures of habitat and habitation for PVTGs** and pre-agricultural communities
3.1 (k)	Right **of access to biodiversity** and community **right to intellectual property** and traditional knowledge related to biodiversity and cultural diversity
3.1 (l)	Any **other traditional right** *(excluding the traditional right of hunting, trapping or extracting a part of the body of any species of wild animal)*
Section	**Community Forest Resource Right (CFRR) under CFR**
3.1 (i)	Right **to protect, regenerate or conserve or manage** community forest resources

Source: https://tribal.nic.in/downloads/FRA/FRAActnRulesBook.pdf

PROMOTION OF WADI WITH LEMONGRASS AND PALMAROSA AS INTERCROP TO IMPROVE LIVES OF SMALL & MARGINAL FARMERS

A model devloped by SOOVA

Background

With support from NABARD, 1000 acres of waste and barren land were transformed into WADI project areas with a special focus on improving the lives of SC & ST communities. The WADI project, implemented by SOOVA (Social Organization on Various Aspects), aims to ensure a sustainable livelihood option for 1236 Tribal landed families and 65 landless families in an integrated way.

The uncultivated uplands of the tribal families were developed through Mango-Guava orchard-based livelihood in 0.5 to 1 acre and intercropping with Palmarosa, Lemon Grass and vegetables. The project demonstrated visible results in terms of 1250 farmers continuing with WADI-based horticulture. Mango and Guava plantations were completed during 2015-16, and as intercrops, Palmarosa and Lemon Grass were cultivated across 500 acres. With the support of the SFRUTI scheme under the Ministry of Micro & Small-Medium size Enterprises (MSME), ten oil distillation units were installed in the area to extract essential oil from lemon grass and palmarosa. Value-addition activities like refining, packaging, and branding were added to the basket of interventions to increase farmers' returns from the activity.

The Implementing Organisation

SOOVA has successfully implemented the WADI project in the Udala block of Mayurbhanj district. The organization works to strengthen the livelihoods of tribal and poorer communities. Major interventions of the organization are Natural Resource Management through watershed projects, entrepreneurial skill development of rural youth, and women empowerment through Women Self Help Groups. SOOVA has also started working in Balasore and Kendujhar in addition to its established works in the Mayurbhanj district.

Area covered under the project

Mayurbhanj district is situated in the north-eastern part of Odisha State; a tribal-dominated district where a majority of the tribal communities (Santhal, Bathudi, Bhumija, Bhuiyan, and Kolha) depend upon farming and forest-based livelihoods. The project participant farmers are from Udala block and Ward No-1 of Udala NAC, Mayurbhanj district. The villages covered are Bhurudubani, Purunapani, Urmal, Kanakapada, Bahubandh, Salamunduli, Badkhaman, Antapur, Manikapur, Nuagaon, Damusahi, Phulbadia and Chandrapur village under Udala block. The program, covering 1236 families under WADI-based livelihood, was implemented in 3 phases covering 284, 473 acres and 479 families.

Problem Statement

Tribals from Udala block are mainly dependent on farming, forest-based livelihoods and wage-earning for their livelihoods. Paddy is the major crop grown in Kharif, and in the remaining part of the year, paddy land and uplands remain uncultivated. Due to inadequate groundwater and surface water, irrigation facilities could not be developed for round-the-year farming. Due to such problems these households were unable to make a living out of their existing resources.

The Model

The intervention consists of the promotion of Mango and Guava plantations. Amrapali and Dasheri are two mango varieties selected considering the suitability of North Odisha's climatic conditions and market preferences. Allahabad Safeda is a suitable Guava variety considering its growth, survival, and marketing suitability.

Amrapali was developed as a hybrid variety of Dasheri and Neelum by IARI in 1971.The mango variety has been grown all over India. The tree is a dwarf, regular bearer with cluster of small sized fruits. Its flesh is deep orange red and average yield is 16 tonnes/ha.

Dasheri is reported to have originated in the garden of Nawab of Lucknow in the 18th century. Now the variety has spread across India. It's known for its aroma and taste.

Allahabad Safeda Guava has large fruits, round with smooth skin, white pulp, firm, light yellow and sweet taste at ripening stage.

Intercropping of vegetables such as Cucurbits, Cowpea, Brinjal were taken up in the Kharif season. Radish, Coriander, Cauliflower, and Tomato were grown in rabi. Cowpea and Okra were grown as intercrop in summer, where there was an irrigation facility. Some farmers also grow Ivy Gourd around the year without applying any chemical input.

Table 1 shows the plan of the Orchard

Crops	Varieties	Spacing	No. of Plants
Mango	Amrapali and Dasheri	7 m X 7 m	49 in 1 Acre
Guava	Allahabad Safeda	6m X 6 m	22 in 1acre
Intercropping	Local varieties of Vegetables, Pulses, Spices etc.		
Ber (in borders)	Local	7m	



Plate 1: Intercropping Vegetables in Orchard,



Plate 2: Intercropping Vegetables in Orchard

Photo Credit: SOOVA

To check grazing by animals, cemented pole cum Galvanised Iron (GI) wire fencing is done in compact patches. Regular maintenance of the fences is a contributing factor to the survival of WADI. Land development through the strengthening of field bunds to check surface runoff and trenching (0.6 x 0.6 m) cum bund construction was done across the entire project area, covering an earthwork of 36 cum per acre.
For irrigation in the selected patch, one ring well has been built for five Wadis under convergence with Odisha Lift Irrigation Corporation (OLIC), and one borewell was constructed for a 20-acre patch

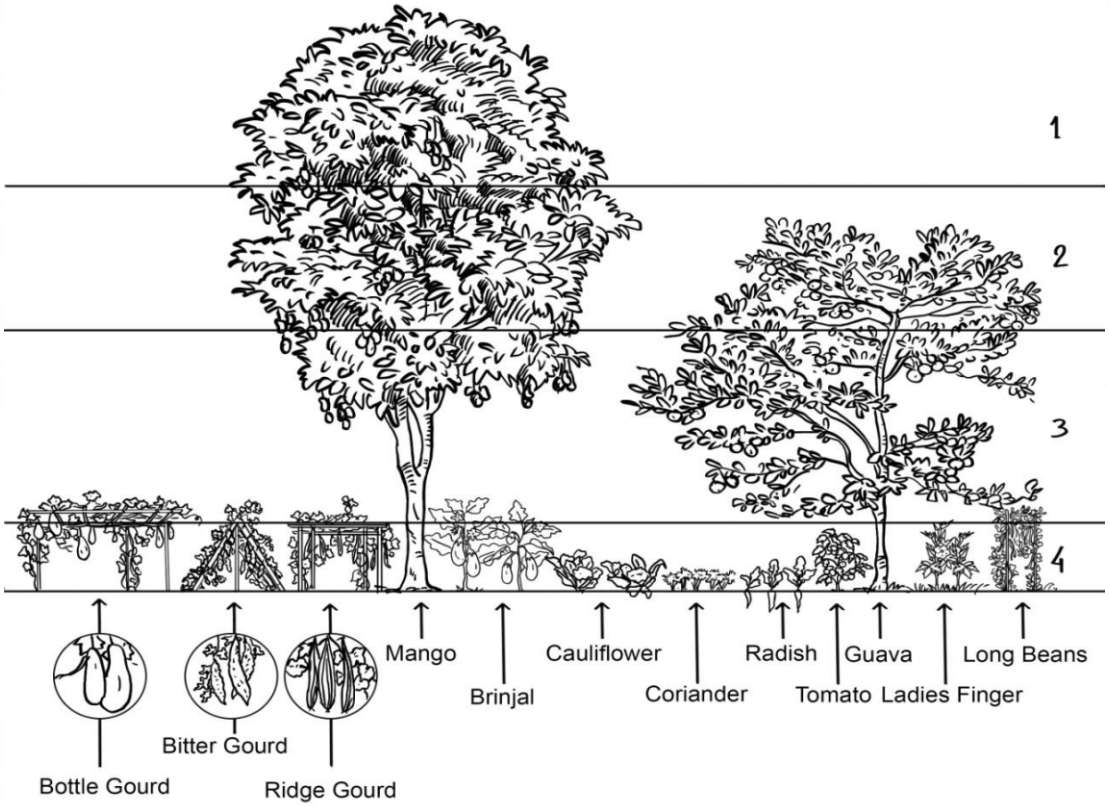


Fig 1: Wadi Model

Illustrations curated by PRADAN

Thus, 15 ring wells and 17 borewells were constructed wherever adequate groundwater was available. The maintenance of horticulture crops was restricted to a maximum of 5 years for each phase, and program support was provided for six years. As WADI is a comprehensive farming system, additional livelihood interventions, such as goat rearing, mushroom cultivation, broom making, and nutrition gardens were taken up focusing on 65 landless farmers.

Udyan Vikas Samitis (UVSs) were facilitated as User Groups to maintain the WADIS. It's members were trained in planning, implementation, accounts management, and compliance with the project requirements. Subsequently, selected UVSs were linked with ITDA, Dept. of Horticulture, Dept. of Agriculture and OAIC to converge various programs and schemes.

Table 2 shows the achievement of the interventions-

Mango plants	44,491 numbers
Guava plants	20,082 numbers
Survival Rate	Mango-78% & Guava: 68%
Lemongrass & Palmarosa	688 Farmers in 575 acres
Vegetables	75 Farmers in 65 acres
Ring Wells	15 nos
Shallow Bore Wells	17 nos
Pumping Sets	3 nos
Jalkunds	6 nos
Farmers covered under irrigation	700

Intercrops

The original design included vegetables as intercrops in the WADI field. However, vegetables were taken up only in 65 acres as farmers preferred to grow vegetables on their homestead or in paddy fields in summer. Large-scale vegetable cultivation was a challenging task, considering marketing constraints and the lack of additional labour force at the household level.



Plate 3: Intercropping Brinjals in Orchard

Photo Credit: SOOVA

After several consultations with multiple stakeholders, there was a suggestion to go for cultivating Sabai Grass as an intercrop in WADI. However, due to limited demand for Sabai (Eulaliopsis binata) grass and considering the upcoming growth in the demand for aromatic crops, Lemongrass (Cymbopogon) and Palmarosa (Cymbopogon martini) were selected as the intercrops.

Lemongrass

Lemongrass grows as a perennial species: oil is distilled from its leaves and flowering tops. It grows well in both rich loamy to poor laterite soil. It smells like lemon due to the high percentage of Chitral; the oil is used in beverages, cosmetics, and perfumes. Though it grows better in high rainfall areas of 2000-2500 cm distributed evenly throughout the year, it can be grown in less rainfall areas by providing irrigation in dry months. It is propagated through seedlings vegetatively by splitting the clumps into slips. Land preparation involves two ploughing, raised beds (30 x 35 cm) with an interbed spacing of 30 cm; 4-5 tonnes of FYM per hectare is needed for sound growth.



Plate 4: Lemon Grass

Photo Credit: SOOVA

Transplantation of slips is done on raised beds at a distance of 20cm in 2 rows. Weeding is done once in 2 months after transplantation. Once transplanted, it can be harvested for up to five years. Harvesting is done by cutting the grass 10cm above the ground. The first harvest is done three months after planting, and subsequent harvesting is done at 45 to 60 days intervals. About 0.5% of oil is recovered from fresh lemongrass, yielding 400 litres per ha from the second year.

Palmarosa

Palmarosa is also a perennial grass that grows well in warm, and humid areas. It is suitable for similar agroclimatic zones and soil conditions as lemongrass. Oil extracted from Palmarosa has high-grade Geraniol (75-90%). It is a hardy crop and can be propagated by raising seedlings for transplantation.

In the current project site, it is being propagated by transplanting slips in the monsoon. Plants producing high-yield and better-quality oil are selected for making slips. Three to four hoeing is carried out during the first year, which may be restricted to two in subsequent years. Clumps are trimmed 20-25 cm above the ground and dug out without injuring roots. In summer, irrigation is carried out at 10-14 days intervals. The crop is harvested at full flowering to the seed production stage to get a good oil yield.

Processing of Palmarosa & Lemongrass

After harvesting, the grass is chopped into 5-10cm lengths and steam distilled. The oil floats on the top of the separator and is continuously drawn off, followed by decantation and filtering. The distilled oil is treated with anhydrous Sodium Sulfate or Common Salt at 20 g/litre to remove moisture. Fresh herbage yield of 30-40 tones/ha with oil yield of about 220-250 liters/ha can be realized from the 2nd to 4th year onwards till the 4th year.



Plate 5: Distillation Unit
Photo Credit: SOOVA

Table 3 shows the details of investments and achievements of the program-

Total Cost of WADI (1000 nos)	Rs 7.9 Crores
Grant	Rs 4.91 Crores (62%)
Loan	Rs 1.08 Crores (14%)
Beneficiary contribution	Rs 1.9 Crores (24%)
Projected Income from 0.5 ac	Rs 38921 after 12 years
Current Income from 0.5 acres	Orchard: Rs 8000 Orchard & Vegetables: Rs 50,000 Orchard & Lemongrass: Rs 10,000

Results

WADI, along with intercrops of vegetables, Palmarosa, and Lemongrass, shows a potential model in the tribal heartland of the Mayurbhanj district. The most striking feature of the model is the survival of WADI and standing aromatic grasses at any time. A Farmer Producer Company called Hingula Agri Private Company Ltd (HAPCL), formed with a membership of 1250, has been registered to grow and sustain interventions. Ten distillation units have been set up to extract oil from grass. HAPCL has a turnover of Rs 50 Lakhs in FY 2021-22, of which revenue from Lemongrass and Palmarosa oil sales is Rs 16,27,980, and slip sales Rs 29,71,446. HAPCL has established linkage with bankers to link farmers under Pradhan Mantri Jeevan Jyoti Bima Yojana(PMJJBY), Pradhan Mantri Suraksha Bima Yojana(PMSBY), Atal Pension Yojana, Biju Swasthya Kalyan Yojana(BSKY) and Ayushman Bharat Yojana.

Challenges of the model

WADI cum Lemongrass cultivation requires committed program support in a cluster approach taking 20-30 farmers to agree in a compact patch. This helps reduce the cost of cultivation and also creates peer support for intercultural operations, water sharing for irrigation, and maintenance of fencing to check grazing by cattle as well as processing & marketing.

Sustainability

Key parameters which have led to the continuity of WADI cum lemongrass cultivation by farmers are –

- Prioritization for horticultural crops
- Organizing farmers into Producer Groups for forward & backward linkages and marketing
- Mobilization of investment cost from NABARD, MGNREGS, and SFURTI
- Overall commitment of SOOVA with committed staff having technical & social skills.

Scope of scaling up/replications

WADI and lemons grass cultivation suit Odisha's tribal-dominated plateau regions. There are programme support opportunities from the Horticulture Department, ITDAs, DMF & MGNREGS and Mission Shakti. Successful demonstration by SOOVA in Udala will be helpful for exposure cum learning by Govt officials.

NABARD may play an active role in disseminating the best practices of the model across the state to draw the attention of District collectors and relevant Departments to explore the model and further assess the feasibility of implementation in different parts of Odisha.

Budhuram Murmu of Urmal village has four acres of Paddy land. He participated in the Wadi program and took up plantation of 70 Daseri Mango plants. He also grew vegetables as intercrop. He also has a herd of nine Goats and one fishpond.

Budhuram has a borewell built through convergence with OLIC with a contribution of Rs 10,000. He also received a Power Tiller at a subsidy of 77%.

Table C1 shows his income in the 2 years 2019-21:

Year	Income from Mango(Rs)	Income from Vegetables(Rs)
2019-20	17000	1,00,000
2020-21	35000	75000

Budhuram sells Mango through Hingula Agri Private Company Ltd (HAPCL) and also procures vegetable seeds from them.

Plate 6: Budhuram Murmu



BANANA CULTIVATION AS A RELIABLE SOURCE OF LIVELIHOOD IN THE TUMUDIBANDHA BLOCK

A model devloped by ITDA, Baliguda

"The net income generated from banana cultivation is about ten times more than the traditional way of generating income from earlier traditional crops of black gram, mustard, and maize. Bananas could bring us more income within a short period, and the benefits accrued have made our life happy and secure", **Subal Patra** *shares.*

Context:

Mundigard Nuasahi is a village under Mundigard Gram Panchayat in Tumudibandh block of Kandhamal district. There are 66 HHs in the village, of which 95% belong to Schedule Tribes (ST). This village is of scenic beauty with a perennial river called Rahul, full of water in the rainy season. Hardworking women and men in the village have faith to sustain families depending on the Jal, Jangal, and Jamin. They depend on multiple sources for livelihood. Three-fourths of their land comprises well-drained uplands with marginal productivity, and the remaining are lowlands used for rice cultivation. In the upland (Padar), short-duration rice e.g.- Parijat, Khandagiri, and Sakara are grown, while in low land, medium-duration varieties like Pooja and Yamuna are cultivated. In years of good rainfall, yields of 1.85 MT/ha from upland paddy and 4.3 MT/ha are obtained from the lowlands. They also rear cattle, goats, and backyard poultry birds; every family rears poultry birds having flock size five and above, while 39% of the families also rear 10 to 15 goats. Siali leaves, Broom, and Sal Resins are collected from forests and sold locally.

Despite the multiple sources of livelihood, every household couldn't meet the family's needs in the village. The average land holding in the village was 2.5 acres, where they used to grow paddy in the lowland and maize & mustard in upland and medium land. Farmers could produce enough paddy to meet their consumption requirements; however, they depended on maize and mustard farming for cash income. The meagre average income of Rs. 4000 from maize and mustard cultivation was insufficient to meet their family's cash requirement. Integrated Tribal Development Authority (ITDA), Baliguda is working for the holistic development of the tribals in the subdivision. With 50% of the area covered under forest and having substantial uplands, creating irrigation infrastructure is challenging here. Banana cultivation was found to be suitable to the local climatic condition, and farmers also showed interest in taking up the activity wherever irrigation facilities have been created. ITDA promoted banana cultivation by utilizing available irrigation sources to ensure additional income.

Objective:

The objective of the intervention was to support tribal farmers in Banana cultivation so that they could earn an additional Rs 50,000 to 70,000 per annum to meet the basic needs of their families. Also, it is envisaged to replicate banana cultivation in more villages based on the success of Muniguda village.

Agro-climatic suitability:

Phulbani comes under agro-climatic zone-5 of Odisha, covered under northeastern ghats. The climate is hot and humid, with an annual rainfall of 1598 mm, a mean maximum temperature of 37 degrees, and a mean minimum temperature is 10.4-degree Celsius. Soil is brown in colour, sandy loam, loamy and clayey, and medium textured. Banana grows well in the temperature range of 15-35 degree Celsius. Deep, rich loamy soil with good drainage is most preferred for banana cultivation. Fertile soil near the foothills and near rivers is suitable for banana cultivation.

Package of Practices:

Tissue culture variety G-9 were used for planting; these varieties have uniform growth and are early yielders. Before planting, the planting material is dipped in 0.5% Monocrotophos and 0.1% Bavistin . For the Kharif season, planting time is June-July, while for the rabi season, it's October-November.

The Banana plantation is carried out based on Patta Double method. In this method, the distance between two rows is 0.90 to 1.2m, while the plant-to-plant distance is 1.2 to 2m. Pits of 0.5x0.5x0.5 cum are dug and filled with topsoil mixed with 10 kg of decomposed FYM, 250 g Neem cake, and 10g Carbofuran. The pits are left open for 15-20 days for solarization. Bananas require a large quantity of water (1800 to 2000 mm annually) to increase productivity. Mundigard has a perennial stream where a Lift Irrigation System has been installed to irrigate the fields. In winter, irrigation is provided at 7-8 days, while in summer, it is at an interval of 4-5 days.

Banana is harvested when the fruit is slightly or fully matured, depending on the market preferences. For long-distance travel, harvesting is done at 75-80% maturity. The planted crop gets maturity for harvest within 12-15 months of planting while a bunch attains maturity 90-150 days after flowering, depending upon the variety. The first crop is ready in 8-10 months from harvesting the main crop, and the second by another 8-9months after the first crop. Thus in 2 to 2.5 years, three crops can be harvested in the village.

Table 1 shows the different activities across the years

JAN FEB MAR APR	MAY JUN	JUL	AUG	SEP	OCT	NOV	DEC
Irrigation Feb, Apr Interculture of Kharif & Rabi Crop	Land Preparation & planting Irrigation of Previous Years Crop Interculture of Rabi Crop		Interculture of Rabi Crop		Planting Interculture of Kharif & Rabi Crops	Irrigation	Irrigation Interculture of Kharif & Rabi Crop

Source: ITDA, Baliguda

Table 2 shows the economics of the activity for 0.25 acre

Component	Quantity	Rate	Amount in Rs for 1 ac	Amount in Rs for 0.25 ac
Land Preparation	2 days	Rs 850/day	1700	425
Labor	269 days	Rs 280 per day	75,320	18,830
Planting Materials	1234 pcs	Rs 18.50	22,829	5,707
Manure	12 cart loads	Rs 800/cart	9,600	2400
Fertilizers	Lumpsum		15,557	3889
Biofertlisers	4 kg	80/kg	320	80
Organic preparations	4 kg	600/kg	2,400	600

Micronutrients	4 kg	250/kg	1000	250
Propping materials			9000	2250
Irrigation	120 hrs	Rs 75/hr	9000	2250
Mulching	Lumpsum		8000	2000
Fencing	Lumpsum		16000	4000
Total Cost	Lumpsum		1,70,726	42,681
Total Sale Value	3 bunches per pit weigh 20 kg sold @ Rs 10/kg		7,40,400	1, 85,100
Net Surplus			5,69,674	1,42,419

N.B : Income Potential up to Rs. 140,000 can be realised from 0.25 acre subject to management practices

Source: ITDA, Baliguda

As labour cost is 44% of the total cost of cultivation, out-of-pocket expenses are minimized for low-income families as they do labour on their own. ITDA provided planting material (300 saplings) and fencing covering 29% of the total cost with intensive monitoring and supervision; the irrigation structure was constructed through convergence with Orissa Lift Irrigation Corporation (OLIC). Till March 2022—Banana plantation across 50 acres has been completed.

Banana cultivation is profitable, and most farmers in Mundigard Nuasahi have earned Rs 70,000 to 1,00,000 and above from 0.25-acre land on an average of 2 crops



Plate-1: A farmers of in his banana field.

Picture Credit: Sankarsan Behera
PRADAN

Key results and scaling up the intervention

ITDA Balliguda, under the Mission Jeevika scheme, took up 50 acres of Banana cultivation covering seven villages with 198 ST beneficiaries in the Tumudibandha Block of Kandhamal district in two phases. In the first phase, 15 acres were supported for 58 beneficiaries in Nuasahi of Mundigard village in the year 2019-20 (Rabi). Within eight months, a participating beneficiary could earn Rs.60,000 -70,000. In the second phase, during 2020-21(Kharif), 150 beneficiaries were supported for vegetable cultivation (e.g.-Beans) in the same area and got a profit of Rs 6000 to 7,000 per beneficiary. During the third phase (2020-21), the area has been extended to 35 acres covering 140 beneficiaries in six villages. Each household is receiving a profit of around Rs.60-70,000/ year. The activity was highly appreciated by the Collector cum District Magistrate, Kandhamal. It also received good coverage in both print and electronic media. The Nuasahi cluster has become a model cluster for others in the District.



Plate-2: Farmers posing in front of cold storage set up by ITDA, Baliguda,

Picture Credit: Sankarsan Behera
PRADAN

Challenges:

Banana needs a perennial water source and sturdy protection fences around it. After a 3-year crop cycle, the plantation must be done in another patch. Thus, farmers growing bananas need alternate fields to plant banana suckers in alternate cycles.

Key Learnings:

1. Community mobilization is crucial for the introduction of a new livelihood program.
2. Implementing such livelihood projects in the village won't be possible without community participation in decision-making.
3. Banana cultivation can be promoted where irrigation and fencing facility is available.

Way forward to scale up :

The climate in Kandhamal and adjacent areas suits Banana cultivation if a perennial water source is available. Good demand for bananas is rising yearly; with limited handholding support, farmers can generate good income from bananas.

ITDA has set up a Cold Storage at Mundigard Nuasahi for bulk quantity storage so that farmers are not forced to sell bananas when the price falls. New market exploration, linkage, and value-added products from banana stems are potential future initiatives.

Case Study :

Mukhi Patra is a resident of Mundigard Nuasahi village and owns four acres of land; his primary source of livelihood is farming, followed by wage-earning and livestock rearing.

In October 2019, Mukhi decided to grow bananas in 0.25 acres of land after attending a farmer's mobilization meeting organized by ITDA Balliguda. Open grazing was a serious obstacle for them to grow any cash crop. He had a patch of land near a perennial stream. ITDA Balliguda provided 300 banana suckers and wire mesh for fencing the plantation patch.



Plate-4, Image of Mukhi Patra

Out of 300 seedlings, he could save 290 banana plants. He earned Rs. 70,000 by selling the bananas harvested in 2019-20. He received a good harvest compared to other farmers by applying sufficient compost in the pits and ensuring timely irrigation and intercultural operations. He earned Rs 50,000 in the second year and Rs. 35,000 in the subsequent year. He used a part of the earning, from banana cultivation, for land development and to treat his ailing wife suffering from a gallbladder stone.

DESI KABERI BRINJAL: THE TASTE OF SUCCESS

Context:

A model devloped by Jana Mukti Anusthan

Since the Green Revolution of the mid-sixties, there has been a push to promote modern and hybrid varieties of crops in a bid to ensure better yields and production. Agricultural universities, institutions and seed companies have focused on yield enhancement by releasing a series of vegetable hybrids. Farmers have been encouraged to take up these modern seeds and agrochemicals to ensure yields at the cost of resilience to climate, pests & diseases, taste and flavour. Conservation of local seeds plays a vital role in future breeding programs with good quality acclimatized to climatic conditions.

Desi Kaberi is a round-purple-streaked indigenous variety of Brinjal popular in Western Odisha & neighbouring Chhattisgarh for its taste, low seediness, and size. Small & Marginal farmers in the Balangir and other districts prefer this variety over commercial hybrids owing to its climate resilience, tolerance against diseases, round-the-year production and yield. This unique variety is currently being cultivated by 244 farmers in the Muribahal block of Balangir district through the active facilitation of Jan Mukti Anusthan (JMA).

The organization has been working in the region for the last two decades. Desi Kaberi Brinjal was revived in the area in 2014 with ten farmers; after the successful demonstration, it has been scaled up across eight villages in five Gram Panchayats for the last four years.

The Intervention

Desi Kaberi Brinjal is cultivated in Kharif and early Rabi season in well-drained land. Farmers preserve Desi Kaberi seeds selected from healthy mature fruits of the previous season crop for sowing in the nursery in May; usually, 3-4 weeks old seedlings are transplanted in June spaced at 60 cm and a row-to-row spacing of 75 cm. Manuring and intercultural operations are done after transplantation on the 15th, 30th, 45th day and so on.

The first picking is usually done within 45-60 days (Aug-Sep) of transplantation. In rainfed conditions, harvesting is possible till the end of October; however, under irrigated conditions, fruiting continues till mid-February. The average yield is 18.5 MT/ha , higher than the national average. 51.4 MT/ha is obtained in selected cases.

Kaberi Brinjal has good demand ranging from 10 to 100 MT per day across respective markets in western Odisha – Kantabhaji, Titlagarh, Khariar, Saintala, Bondamunda, Phapsi as well as Raipur (Chhattisgarh).

Table - 1

WHY DESI KABERI BRINJAL IS SUITABLE		
Suitability for SM Farmers	Agro-ecological compatibility	Market Attractiveness
Home grown seeds Knowledge & Skill of cultivating the variety with Organic inputs High local demand & income of Rs 70,000 to 100,000 per acre.	Suitable & resilient to local climate & soil conditions. Hardy, Long duration crop with all round production	Good Size (400-700g/fruit)., consumer preference, 2-3 pieces/ kg Less Seeds Attractive Shape & Appearance Niche Organic product of the region with good links with urban markets, hotels etc.

The Intervention

1. Seed selection: Healthy plants at least 2 meters away from the field border producing large fruits (700 to 800 g) are identified and marked by tying a ribbon to their stem. Healthy fruits from the 1st or 2nd picking are identified for seed collection and marked. Fully Ripe -Yellow fruits are plucked and cut into pieces; they are soaked in water for an hour, and then the seeds are squeezed out of the cut pieces. The seeds are washed, cleaned and dried in a shaded, well-ventilated area for 1-2 days. After drying- 100 to 200gms of seeds are wrapped in an airtight poly pouch and stored in a cool and dry place for future sowing.



2. Seed treatment: About 100 g seeds are required to raise a nursery of 1-acre planting. Before sowing, the preserved seeds are treated with 10 g of Bio fungicide powder: Trichoderma viride.

3. Nursey raising: The treated seeds are sown in Raised Beds , which help avoid water logging conditions; a channel of 50 cm is kept in two consecutive beds. About 5 to 6 such beds are constructed to raise seedlings for 1-acre land. Around 10 kg of decomposed Farmyard Manure (FYM) or Compost is mixed well with 1 kg of powdered Neem cake and 25 g of Bio fungicide applied over the nursery and levelled with a smooth finish. Treated Seeds are sown at a distance of 4-5cm and covered thinly with fine compost. The bed is further covered with straw and lightly sprinkled with water to maintain moisture. Every alternate day- the bed is monitored in the morning & evening hours; after 4 to 5 days, the straw is removed as the germination commences. Handi Khad is applied at the rate of 30ml/litre of water to check the infestation by any leaf-cutting insects.

The seedlings are ready for transplantation when they attain a 12-15 cm height with 2-3 true leaves (usually within 4-5 weeks of sowing).

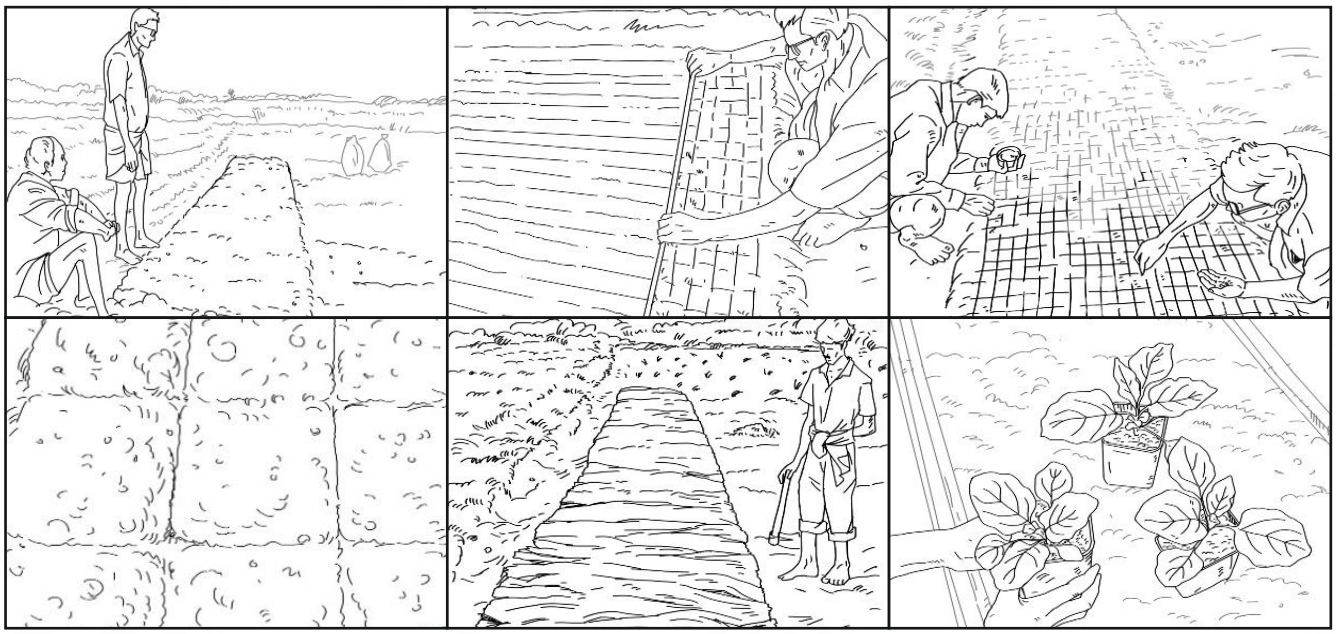


Fig 1- Nursery Operations
(Illustration curated by PRADAN)

4. Main Field Preparation: The main field for Brinjal transplantation is prepared by 3-4 ploughings to make the soil loose and improve tilth. 3 to 5 tractor loads of mature FYM are applied per acre, and ridges of width 30-45 cm are constructed 75 cm apart. Brinjal seedlings are further transplanted in pits on the ridge.

5. Manure application: Manure application varies depending on the practice the farmer adopts, as mentioned below:

NPM Farmers				3 to 5 Tractor loads of mature FYM/Compost per acre; 70% -Basal & 30% -Split dosage during interculture operations.
General Farmers				2 to 3 Tractor loads of mature FYM/Compost, 25 kg DAP & 10 kg MoP per acre

Jeevamrit is applied after 15 days of transplanting at 1000 litres/acre; during interculture operations- Ghanajeevamrit is also applied on the ridges. Depending on the growth of the plant and signs of nutritional deficiency (e.g.- discolouration of leaves), an additional application of Jeevamrit is carried out

Preparation of Jeevamrit:

Jeevamrit is an organic, nutrient-rich liquid fertilizer that promotes soil fertility and plant growth. It is prepared by using ingredients-cow dung, cow urine, jaggery, gram flour, water. At first 10 kilograms of cow dung and 10 liters of cow urine is mixed in a container. Then one kilogram of jaggery and one kilogram of gram flour is added to the mixture. The mixture is stirred well until all the ingredients are thoroughly mixed. Then 200 liters of water is added to the container and mixed again. Then the container is covered with a cloth and let it ferment for about a week. The mixture is stirred daily. After a week, Jeevamrit is ready. Farmers dilute it with water before applying to the soil or spray it on the leaves for better nutrient absorption.

Preparation of Ghanjeevamrit:

Farmers mix 10 times of dry compost with Jeevamrut to prepare Ghanjeevamrut and keep in a shady place for 3-4 days before applying.

6. Plant protection: Though Desi Kaberi is tolerant to several pests and diseases that generally affect hybrid varieties, protective measures are taken with fortnightly application of Handikhad & Neemastra at 30ml/litre. Bacterial wilt is prevented through Crop Rotation or changing the plots; farmers reported fewer Shoot & Fruit Borer cases where trees and shrubs abound near the Brinjal field as resident birds feed on the insects. Even when there is an infection, farmers prefer manual control to agrochemicals; they cut the portion below the affected shoots and remove the fruits. Yellow Sticky Traps and Pheromone Traps are also used as indicators for checking insects.

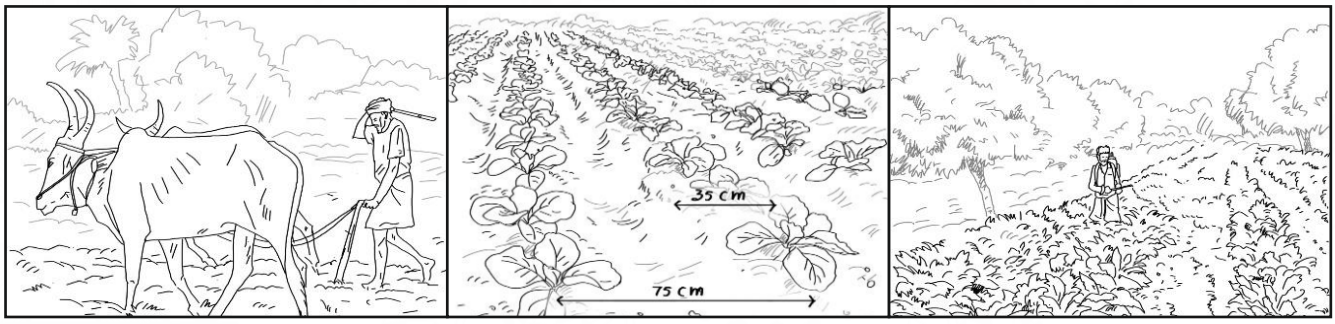


Fig 2- Main Field Operations
(Illustration curated by PRADAN)

The Kharif Crop- Nursery is raised in the 2nd Week of May and transplanted in the 1st Week of July; Picking starts from mid-August and continues up to October (under rainfed) and mid-February (under irrigation).
For the Rabi Crop- Nursery is raised in the 2nd week of August and transplanted in the last week of September; picking starts from mid-January and continues till June.

Table 2 : Crop Calendar

Month	Nursery	Transplant	Picking-Kharif	Picking - Rabi & Summer
May	2nd week			Picking
Jun				
Jul		1st week		
Aug	2nd week		Picking For Rainfed	
Sep		4th week		
Oct				
Nov			With Irrigation	
Dec				
Jan				Picking
Feb				
Mar				
Apr				

Kaberi Brinjal produces almost around the year and has high demand in regional markets. The fruits weigh around 400-700g per plant, and fruiting is about 10 kg under irrigation/season. However, yields up to 15 kg have been reported. The production per plant varies depending on spacing, soil fertility and adapted best practices.

Table 3 shows the economics of Desi Kaberi Brinjal Cultivation per 1 acre-

Components	Unit	Rate	Amount-Rs
Seeds	100 g	Rs 10,000 per kg	1000
Farmyard Manure	2.5 Tractor load	Rs 1500 per tractor	3750
Organic inputs	Lumpsum		4000
Lime & micronutrients	Lumpsum		4000
Land Preparation	6 days of animal traction	Rs400 per day	2400
Hired Labor	25 persons	Rs 345 per day	8625
Total Cost of Cultivation			**23,775**
Total Production	8000 kg	Rs 12/kg	**96,000**
Net Surplus			**72,225**

Note: Based on prices of FY 2022-23

One acre of Desi Kaberi brinjal can give Rs 72,225, a substantial income from one crop. Freshly harvested Brinjals are sorted and packed in jute bags for transportation to market though traders also lift from the villages. Farmers sell directly at Titlagarh, Kantabanji market, along with other crops like Tomato and Ivy gourd during the Kharif season. During the peak season of Sep-Oct, the price realization is Rs 30-40/kg; however, it falls to Rs 12/kg by February. Kaberi variety always fetches about Rs 2 to 3 per kg higher price than the hybrid varieties of Brinjal.

Table 4 shows the average volume of Brinjals traded in different markets-

Titlagarh	Kantabhaji	Bondamunda	Phapsi	Saintala	Raipur
Quintals/day					
400	400	150	100	100	1000

Trader Name- Ashok Tandi, Mob- 8260600958



Plate 1: Harvesting Desi Kaberi Brinjal
Photo Credit- Janamukti Anusthan



Plate 2: Desi Kaberi Brinjal readying for sale
Photo Credit- Janamukti Anusthan

Key Strategies to scale up:

Since November 2018, Jan Mukti Anusthan has been implementing Agriculture Production Cluster(APC)- under this project, farmers are being organized, and systematic crop interventions are being carried out with the following components-

- Mobilizing 100-150 Women Farmers in 23 Producer Groups (PGs) from 2 to 3 adjacent villages.
- Conducting Annual Crop Planning for each farmer considering agro-ecological suitability, farmers' preferences, and market demand
- Developing a profile of all Small & Marginal Farmers interested in the cultivation of the Desi Kaberi variety
- Collection of good quality Desi Kaberi Brinjal seeds from Seed Farmers and distribution among other PG farmers who do not have seeds
- Ensuring the return of distributed seeds with a 20% additional amount for scaling up to new farmers
- Demonstration of Micro Irrigation with Drip and protection under barbed wire to prevent grazing
- Regular training of Women Farmers on different steps of Brinjal Cultivation; Nursery raising, Land preparation, Intercultural Operations, Preparation of manures, harvesting, packaging for marketing of produce
- Identifying & Organising Farmer Field Schools for Exposure Visits.

Rajkumari Banchur from Maa Thakurani Utpadaka Gosthi-Muribahal cultivated Desi Kaberi on 0.80-acre land. She transplanted 3500 plants at a spacing of 60 x 75 cm; she applied 4 tractor loads of farmyard manure and adopted NPM practices to check for diseases and pest attacks.

First plucking was done in mid-September when retail price was Rs 40/kg. From Mid-September to Mid-January, 7 kg of fruits were harvested per plant totaling 200 quintals, out of which 190 quintals were sold fetching her Rs 2,00,000 till the first week of February.



Rajkumari's husband Ramvilash, who toiled in the land along with her happily says, "growing so much brinjal with NPM measures boosts my confidence in organic farming practices". Also, a Borewell cum Drip irrigation System has been installed in her field with convergence from OLIC and the Department of Horticulture. Rajkumari has earned more than Rs 4.5 lakhs from vegetables in 4 acres of land but among all the crops, she gets the highest income from Desi Kaberi. Her farm is a demonstration model for other farmers in her village.

Results:

In 2021-22 about 244 farmers took up cultivation of Desi Kaberi across 44 ha Muribahal block of Bolangir district. Farmers can earn Rs 70,000 from an acre of land with Desi Kaberi Brinjal. Women Producer Groups are actively interested in vegetable cultivation, with Desi Kaberi being one of the principal ones. Several groups are taking up the organic approach and preparing Jeevamrit, Handi Khad, Neemastra etc. Through convergence from OLIC and the Department of Horticulture, some farmers have been supported to take up Brinjal cultivation under Drip Irrigation and protection with fencing. Traders have started lifting brinjal through Milit Uthan Farmers Producer Company Ltd.

Challenges:

For Kharif Brinjal, the land selection is very critical as due to a lack of proper drainage, damping off in plants was observed, severely affecting the survival and fruiting. Also, preparation and timely application of NPM measures as preventive is important to maintain plant health

Impact and outcome:

Muribahal block of Bolangir District has good potential to scale up vegetable cultivation. Compared to the chemical-intensive and Genetically Modified Cotton, which not only degrades soil but has diminishing returns (Rs 15,000 to 20,000/ac) every passing year -the cultivation of Desi Kaberi Brinjal gives good yield and income (Rs 70,000/ac) with organic inputs which help in enriching soil. Mobilizing women farmers as Producer Groups and convergence support from Horticulture Department, Mission Shakti, OLIC/OAIC has made vegetable cultivation an attractive vocation helping reduce migration as wage labour to urban centres.

Innovation and success factor:

The implementing organization- JMA's participatory approach to identifying the right indigenous variety and its initial trial and multiplication with farmers was the key innovating factor. The organization strongly believes that healthy and quality indigenous varieties have the potential of not only higher yields and income but also regenerating soil and the environment through applying composts and eliminating synthetic pesticides while enhancing the market demand and increasing the shelf life of the produce.

Scalability:

Desi Kaberi Brinjal Cultivation is highly suitable for small and marginal women farmers under rainfed and irrigated conditions. It is a local variety, well adapted to the soil and climatic conditions and the farmers' skill; the cost of cultivation is low while returns and market demand are high. Farmers produce seeds locally using simple techniques, thus reducing dependency on seed companies.

The way forward:

Desi Kaberi is an indigenous variety preserved by few farmers since immemorial. The variety survived the competition and promotion of modern varieties and successfully pushed off the hybrid varieties.

Indigenous varieties are climate resilient and respond well under organic practices; they have a higher tolerance to pests and diseases and are more nutritious and liked by consumers. JMA's intervention in promoting Desi Kaberi Brinjal is like a lighthouse for initiating the identification and scaling of many more such unique cultivars.

With the looming dangers of climate change, preserving the climate-resilient varieties is the need of the hour. Civil Society Organizations (CSOs), Farmer Producer Organizations (FPOs), and scientists must cooperate to preserve and propagate local varieties for their uniqueness and the predictability of production and stable income for farmers. Tribals and other marginalized communities who conserve and cultivate such indigenous varieties need to be encouraged and empowered. Agriculture and Horticulture Department and Integrated Tribal Development Agencies (ITDAs) need to develop a plan to promote indigenous varieties through their programs and schemes.

Milit Uthan Farmers Producer Company Limited
Registration Date: 25.03.2021
CIN Details- U01100OR2021PTC036009
PAN- AAOCM4576C
TAN-BBNM04490D

WOMEN FARMERS LED VILLAGE TRANSFORMATION IN NIPANIA.

A model devloped by SHRISTI

Background

For tribal and smallholder farmers from the Harichandanpur block in Odisha, distress migration, the struggle for drinking water, shortage of food, and malnutrition were part of their lives. They had never dreamt that they would be able to overcome these obstacles. However, the constant and dedicated handholding support of the SHRISTI (Society for Harmonious Renaissance of Ideas through Simple Technological Initiatives) has ushered in transformative changes in people's lives.

One such shining example is Village Nipania (meaning a village without water) which was transformed into a lush green village with round-the-year cropping. The transformation of the village was possible through interventions in water conservation and the demonstration of improved farming techniques. SHRISTI is a Civil Society Organization working in Odisha for over 20 years, focusing on holistic rural development by forming sustainable and self-reliant community institutions. SHRISTI does this through well-planned and comprehensive programs on livelihood, community mobilization, integrated natural resource management, integrated watershed development, plantation, and skill development. The goal of the organisation has been empowering women from poor and marginalized communities, improving their lives and livelihoods.

Village Nipania is under Sunapenth Gram Panchayat of Harichandanpur block in Keonjhar district of Odisha. Most (93%) of the village's population are from the Adivasi community. The village is endowed with natural resources that include: 59% of the geographical area of the village is Rebena Reserve Forest, through which flows Remala stream. Two-thirds of the arable land is upland, while 17% and 23% are under medium and low land categories, respectively.

Kharif Paddy was the villagers' main crop, whereas collecting and selling different Non-Timber Forest Produce (NTFPs), e.g., Sal leaves, Mahua, Tamarind etc., was the secondary livelihood activity. Families also rear small animals, e.g. Goats, to meet contingencies and consumptions during social occasions.
The lack of economic opportunities in the village made people migrate to Khorda, Bhadrak and Anandpur on a seasonal basis with their entire family members for cash income. During the kharif season, they would also go to neighbouring villages Sunapenth & Thakurpada for daily wages.

Goal

SHRISTI team carried out several community discourses, and the community decided to take up the Goal: Doubling farmers' Income, through women's collective-led, integrated natural resource management(INRM).

Objectives

1. Organizing women collectives
2. INRM-based planning and interventions.
3. Crop demonstration and market linkage

To work towards attaining the goal, community leaders were selected, and different trainings and exposures were carried out. It included income and expenditure analysis at the family level, planning for their agriculture production and compatibility of multiple livelihood options, planning for better Income, financial assistance on the drip irrigation system, farm inputs and new goat purchase etc.

Social issues, e.g., addressing family conflicts, liquor prevention, etc., were also taken up. The Village Organisation (VO) took up the major initiative towards all aspects for economic enhancement to ensure Rs. 100,000 additional income in a year. Credit availability through bank linkage also became easier, and the Self Help Groups (SHGs) could mobilize savings and leveraged loans for livelihoods and other purposes.

Matrushakti Producer Group was subsequently formed, federating the SHGs as a producer institution and they have got support from the Department of Agriculture, Horticulture, ITDA, etc.

Interventions strategies adopted in the village:

1. **Community mobilization:** Women from tribal and poor households were mobilized to join SHGs. In every village, VOs were also facilitated, which became the nodal agency to plan and assist in the execution of schemes. Three members from each SHGs attend the monthly meeting of the VO where the activities of SHGs as well as Producer Groups were reviewed.
2. **Participatory planning:** The VO members carry out household surveys, focussed group discussions and visioning exercises to orient families to prepare a realistic livelihood plan based on available natural and human resources. Households' plans were further shared at the SHG level, where peers contribute to the planning. The SHGs share their plans at the VO meetings, where SHRISTI professionals also provide technical inputs and assist the VO in preparing a road map for implementation.
3. **Plan execution:** After the approval of the village plan, the VO informs the SHGs regarding its budget, time and specification of the activities to be carried out. Hamlet-level working committees, spearheaded by women, further supervise the quality and quantity of work to be carried out along with the support of technical experts from SHRISTI and present all documents to the VO.
4. **Grooming women leaders to take charge:** Dynamic women leaders from SHGs participate in several trainings on the planning process, implementation, and monitoring exercises. The life journey and success of Women led VOs are shared at Panchayat and Block Level on Women's Day and other such events to encourage and build their confidence.
5. **Grooming of Entrepreneurs:** For farm-based livelihood activities, there is a need for good quality seedlings, services of farm machinery as well as deworming and vaccination services for livestock. These services are required at the farmers' doorstep at an affordable price. Agri Entrepreneurs(AEs)were mobilized and groomed by imparting training to improve their entrepreneurial and technical skill; they were provided handholding support to demonstrate good business possibilities.
6. **Handholding support and completion of 2-3 crop cycles successfully**
   Focussed trainings were imparted on different stages of the crop following a cropping calendar. Interventions like nursey raising, transplantation, intercultural operations, and disease management were ensured through field visits and direct supervision by women farmers. Cross-learning visits among women farmers in each other's fields were also conducted. Farmers were trained in harvesting, sorting and grading to enable them to market their produce. Linkages were established with traders where farmers' groups negotiated to get fair prices for their produce.
7. **Grooming staff with Perspective:** The recruits to SHRISTI also go through Orientation cum Field training. During the initial one-month training, they get exposure to community institutions, livelihood practices and different models to understand different programs for addressing rural poverty through farm-based livelihoods who could better contributed to targeted villages including Nipania

8. **Convergence with programmes and schemes of line dept:** Village plans were categorized with related programmes and schemes of line departments. The plans were approved in the Gram Sabha. VO representatives and SHRISTI staff further interacted with Department and submit the plans. Program documents and contributions were submitted as per standard formats prescribed by Horticulture, Agriculture, Animal Resources and Mission Shakti Dept., etc.
9. **Systematic plan, review and learning process:** SHRISTI believes that completing a learning cycle helps a project staff and community worker grow. Key deliverables and timelines are planned and executed by the field staff under the mentorship of an experienced staff. Weekly cluster-level meetings of Community Resource Persons (CRPs), Udyog Mitra (UMs), AEs etc, are conducted and progress reviewed and their quarries are clarified.

Defining the model

Interventions were taken up under a saturation approach for the village. The key components of the interventions planned were Land and Water treatment for in-situ moisture conservation and the creation of irrigation sources. Efficient water management by utilizing Drip and Sprinkler technology, quality seedings supply, farm machinery services through AEs, and the Creation of water storage infrastructure were the focus areas.

1.Land and Water Interventions

As the village had acute water scarcity, the model involved increasing rainwater conservation to recharge groundwater, which could then be taken up for irrigation purposes.

Table 1: Interventions for in-situ moisture conservation & water use.

5% model	6ha
30*40 model	4ha
Soil Conservation Measures (Gully plugging, Loose Boulder structures, Land development)	61.6 ha
Farm ponds (size 40ft * 40ft)	7 nos
Dug well	1

2. Creation of irrigation infrastructure: Following land treatment, when the groundwater level increased, electricity-operated deep borewells were installed, with each borewell irrigating a minimum 2 ha area.

3. Efficient water use: Drip systems and mulching were adopted for 8 ha of land to minimize evaporation loss and surface runoff, especially near the homestead.

4. Supply of quality nursery seedlings: Two commercial nursery units were established and run by AEs to supply quality seedlings to the farmers in the village and sell the surplus seedlings outside the village.

5. One **Farm Machinery Centre** was established by one AE to provide land preparation, harvesting and other services on rent basis.

6.**One Solar operated Cold Storage unit** (5 MT capacity) was set up for temporarily storing vegetables during a drop in prices or less demand for vegetables.

7. **Growing vegetables** using Drip and mulching technology

Interventions at the Farmer's level

Table 2 : Investment Vis-a-Vis returns at Farmer's level

Total investment per family		Investment			Convergence Possible		Return
investment	Unit	Total	Resource mobilized by SHRISTI	Farmer's contribution	Govt.	Loan	Per Annum
Fixed Assets							
Irrigation (1 asset 3 users)	Bore Well & Dug Well	50,000	35000	15000	16666		
Drip Irrigation (Rs.1000/decimal)		25000	15000	10000	15000		
Sub total		**75000**	**50000**	**25000**	**31666**		
Working capital							
Paddy	1 ac	15116		15116	0	9070	47500
Vegetable	0.5 ac	40740	500	40240	12000	24444	75000
Livestock (own stock)	10-20 no	1500	500	1000	0	900	25000
NTFPs						0	10000
Subtotal (without asset cost)		**57356**	**1000**	**56356**	**12000**	**34414**	**157500**
Total		**132356**	**51000**	**81356**	**43666**		

NB: For paddy line transplantation, farm yard manure application, and Nutrient Management whereas for Vegetables and creepers soil-less nursery, farm yard manure application, drip, mulching, and trellies were the key interventions.

Key Description of Table 2

For a typical farmer owning 1.5 acres of cultivable area, interventions were assured irrigation for 0.5 acres, Drip irrigation for 0.5 acres, Paddy cultivation in 1 acre, Vegetable cultivation at least for 2 seasons in 0.5 acres. Promotion of goat rearing ensuring deworming, vaccination and medication for households having 10-20 goats. Family would also earn from NTFPs collection & trade of Tamarind and Mahua. An irrigation asset was developed for each household at a total cost of Rs 1,50,000, out of which resources mobilized by SHRISTI were Rs 1,05,000 (70%) and Farmer's contribution Rs 45,000 (30%).

As shown above, deducting the working capital cost - a net Income of about Rs 1,00,000 per annum is obtained. There has been convergence for vegetables from Horticulture schemes. For working capital - Women Farmers could also avail of loans through SHGs and bank linkages.

Though initially the interventions were developed with the grant support of the Tata Trust, Mumbai through SHRISTI & Farmer's contribution, later under Agriculture Production Cluster (APC) project, it was implemented from Govt schemes & farmers' contribution as well as loans from SHGs and banks.

Impact of the Interventions:

Nipania village is now on the path towards development; Village Organisation (VO) along with other women institutions such as SHGs and producer groups are working in tandem to make the village prosperous. Integrated natural resource management, income enhancement through strengthening livelihoods, agri-infrastructure creation, introduction of modern technology for agriculture productivity enhancement, drinking water, etc. are the areas upon which VO is working with government, CSOs, and private organizations. The VO meetings are conducted regularly by villagers and SHG representatives. In these

meetings, members share their experiences, issues, and achievements and then they jointly resolve the problems, taking collective decisions. All representatives carry forward the decision and share it with their SHG members and producer group members.

Producer groups are helping women farmers in taking up high value crop cultivation at scale by assisting women farmers in input procurement, Agri-infrastructure creation, introduction of technology and marketing of their produce. Drip irrigation, plastic mulching, solar based irrigation, solar fencing, and high-tech soil less nurseries are some of the technologies that have been introduced in the village for productivity enhancement. Just a few years ago, only a handful of farmers were growing vegetables but because of these interventions, farmers now grow vegetables throughout the year and earn a handsome income from it. Producer groups are also ensuring timely vaccination and deworming of livestock such as goats, BYPs, etc., with the help of veterinary department. This has resulted in checking the outbreak of PPR disease in the village. Model goat sheds have also been constructed in the village for better care of goats, thereby enhancing productivity in goat rearing. Water recharging structures created following the INRM principle has increased the ground water level. INRM structure such as five percent model has ensured availability of crop saving irrigation in case of drought and this has increased the paddy productivity from 2.5 MT/ha to 5 MT/ha.

Table 3 : Glimpse of the Progress

Particular	Progress till March 2023	Target achieved
Total Household	115	
Total Tribal Household	95	100%
Total SHG	9	100%
SHG Household coverage	97	84%
HHs with Irrigation Facilities	63	64%
Household involved in 2 seasons commercial vegetable cultivation	53	54%
Household involved in 3 seasons vegetable cultivation	38	39%
Improved paddy	81	83%
Goat Household	78 (Herd size 6- 8)	80%
Hi-tech Nursery	1 1.5 lakhs seedling capacity	100%
Lakhpati farmers (Out of 97 HHs)	81	83%
PG	1	100%

Due to these interventions, men have stopped distress migration and sharing the workload of women in farming in Nipania. Their children aspire for better education and higher studies. Nipania has moved on from being a poverty struck village to being recognized as a Prosperous Village. Now farmers and representatives from private and government organizations visit Nipania village to learn from it. VO also observes its Annual Day every year by inviting government officials from different departments where they share their annual progress, achievements, and planning for the upcoming year. The success story of Nipania has become an inspiring story for others both in the district and beyond.

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Parbati Munda *has 5 ac of land and her husband Sidhu Munda used to migrate outside for wage earning as the income from agriculture was insufficient to meet the family expenses. They could produce Paddy which was enough only to meet her family's need but not for sale*



Parbati Munda *joined a SHG mobilised by SHRISTI and started vegetable farming. She was trained for improved vegetable cultivation and supported in setting up a Drip irrigation System in her land as well as a High Tech Nursery unit.*

In Fy 2021-22 *she grew vegetables in all three agriculture seasons. She grows vegetables on 0.5 ac of land. She grew Bitter Gourd in 0.3-acre land and earned Rs. 50,000 from it; in winter she did grow Tomato, Cabbage, and Cauliflower and she could earn Rs.100,000. Parbati also owns a farm pond and a borewell. She earned Rs 4,80,000 from her nursery in 4 phases during Kharif in FY 2021-22. Parbati is now an inspiration for the community and several officials, CSOs, and Panchayat members visit her field to learn from her achievements.*

Scalability

SHRISTI has established a similar model intervention with 525 farmers in the Harichandanpur block of Keonjhar district. Through Agriculture Production Cluster (APC) Project, similar models are being scaled up in other blocks of Keonjhar, Mayurbhanj, Dhenkanal and Sundargarh districts. Other NGOs are also trying to scale up the model by mobilizing resources from ITDAs, the Department of Agriculture, Horticulture, OLIC, OAIC, Mission Shakti, and through bank linkages.

JOURNEY TOWARDS PROSPERITY THROUGH PRODUCER COMPANY
A CASE STUDY OF KOLANRA BLOCK

A model devloped by PRADAN

Context:

Rayagada is a tribal populated district in the southern part of Odisha and is endowed with vast reserves of minerals, this is why many industries have mushroomed in the district. Kolnara block is one of the poorest blocks in Rayagada district with 39% of households being landless. Frequent occurrence of drought, reduced soil quality due to GM Cotton farming, and lack of irrigation facilities are some of the major challenges in this block. The primary occupation of people is Agriculture, followed by Wage Labour; Paddy is the main crop followed by Cotton.

Although vegetable farming is more profitable than cotton, until a couple of years ago, many farmers used to opt for the latter. The reason behind it is the existing facilitative ecosystem for cotton farming. Money lenders provide inputs and credit at the doorstep and procure the output at a better price than MSP declared by the Government. In addition, many opt for wage-earning in Paper Mills. Despite knowing the adverse effects of eucalyptus plantations, it has emerged as a lucrative option for many farmers in Kolnara blocks as Paper mills procure eucalyptus timber.

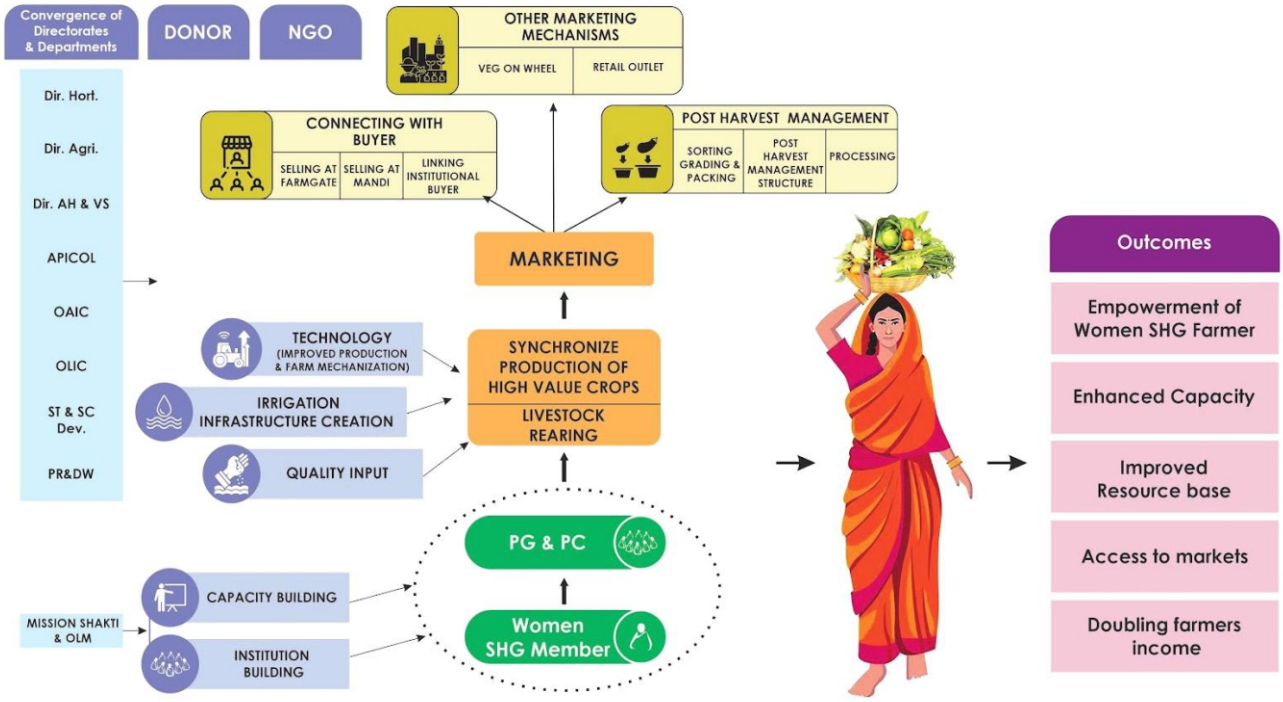
The promotion of Agriculture Production Clusters (APCs) in tribal regions of Odisha project was launched in the year 2018 in 40 blocks of Odisha and Kolnara was one of the blocks. In the last two years, through the APC project, crop-specific clusters have been promoted for Brinjal and Marigold. The APCs are creating a positive experience whereby farmers are gradually shifting away from Cotton farming to vegetable farming, floriculture, and livestock rearing.

Description Of APC project:

Inaugurated by the honourable Chief Minister of Odisha on 6th November 2018, the project focuses to empower small and marginal women farmers by doubling their income sustainably through collectivization and synchronized production in backward blocks of the State. Promotion of the Agriculture Production Cluster (APC) in Tribal Regions of Odisha is a collaborative effort by the Department of Agriculture & Farmers Empowerment, Panchayati Raj & Drinking Water, Mission Shakti, Bharat Rural Livelihood Foundation (BRLF), District Mineral Foundation (DMF) and Professional Assistance for Development Action (PRADAN). In the initial phase, 17 partner organizations, supported by BRLF, were implementing the APC project as facilitating NGOs.

The project facilitates the promotion of Producer Groups (PGs) and Producer Companies (PCs) for sustainability by ensuring synchronized production, linkage with stakeholders to optimize production and access different livelihood support infrastructures, and orchestrating the market ecosystem to actualize better prices. Later, Bill and Melinda Gates Foundation (BMGF) partnered with APC in the year 2020-21 to corroborate and substantiate APC's key outcomes – strengthening Producer Companies and Production & Market Systems. The project emphasizes women's participation in the governance system and institutional arrangements of production and market systems.

Figure-1 : Schema of APC Strategies



As one can see from the schema that the entire APC ecosystem focuses on five major components:

- Promotion of Farmers Collective
- Synchronized production.
- Creation of productive livelihood assets
- Improved livestock rearing
- Promotion of Agri-entrepreneurs and market ecosystem

Interventions in Kolnara Block:

PRADAN is the partner organization of the APC project in the Kolnara block and carried out the following interventions to improve the lives of small and marginal farmers in the block-

The first step was to collectivize women SHG members of the Kolnara block through Producer Groups-PGs. Each PG consists of 100-150 SHG members. The objective of these producer groups is to provide end-to-end support to the farmers in vegetable farming, floriculture, and livestock rearing. Till now 3000 women SHG members have been collectivized through 23 producer groups.

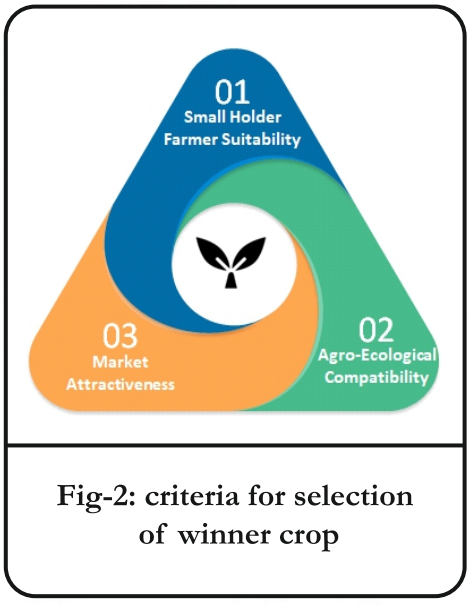


Fig-2: criteria for selection of winner crop

Once the producer group was formed, members identified one or two crops as Winner crops. In Kolnara Block Brinjal and Marigold were identified as Winner crops based on market demand and agroclimatic sustainability.

The next step was to ensure synchronized production of winner crops so that a specific amount of farm produce is harvested at a regular frequency at the farm gate. To ensure it, all the women farmers were facilitated to raise nursery beds on a specific day decided by the PGs. Transplantation of the seedlings was also ensured on a specific day.

The availability of credit during the beginning of agriculture season was a major challenge due to which farmers were unable to procure inputs on time. Hence, PRADAN engaged with Odisha Livelihood Mission and Mission Shakti to avail timely credit to SHGs. About 300 farmers could take credit from the banks in the Kharif season of 2022-23 through Mission Shakti.

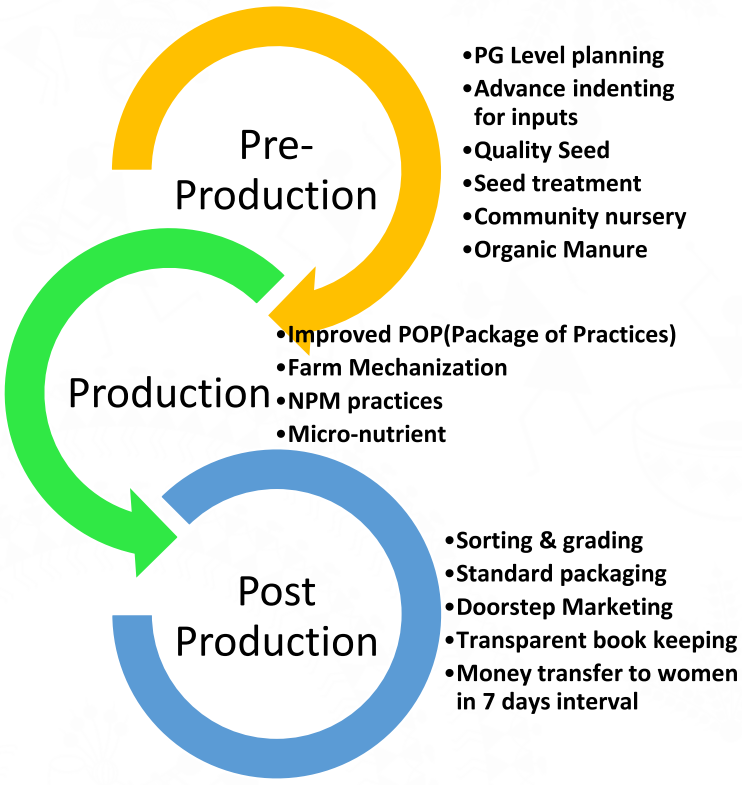


Fig-3: Interventions in value chain of winner crop

Table-1 : Season wise crop intervention

Season	Crop	Spacing	Major Interventions
Kharif	Brinjal	2.5*2.5	1. Seed treatment, Raised bed nursery, Maintaining appropriate spacing, Following Non-Pesticide Management(NPM) practices, Application of farm yard Manure. 2. Seedlings for marigold cultivation are imported from West Bengal.
	Marigold	1.5*2	
	Chilli	2.5*2.5	
Rabi	Marigold	1.5*2	
	Bean	3*3	

Creation of productive livelihood assets (FY 2022-23):

Irrigation infrastructures for 601 households were created in 376.8 acres through convergence and 1850 farmers accessed farm mechanization worth 65 lakhs in the FY 2022-23.

Improved livestock rearing (FY 2022-23):

Under the project, 1264 families are continuing improved livestock rearing in Kolnara Block. In 8 numbers of PGs, farmers are practising intensive livestock rearing ; total 34 Prani Mitras (PMs) have been groomed to provide deworming, vaccination, and other livestock services to women farmers. A total of 106 goat sheds and 282 Backyard Poultry (BYP) sheds have been constructed. By the end of December 2023 ; total 81.32 quintals of livestock have been sold fetching Rs. 10.32 Lakh in the hands of women. ITDA, Rayagada has supported livestock intervention in Kolnara Block.

Promotion of Agri-entrepreneurs and market ecosystem:

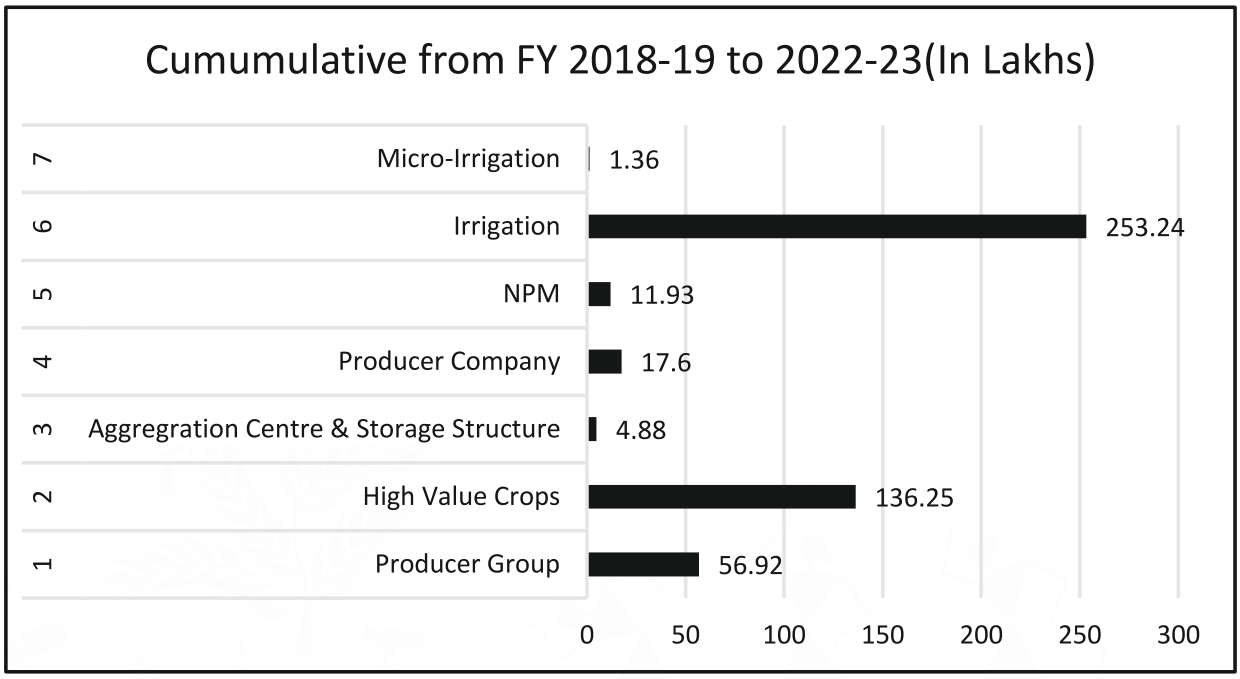
Quality Agri-inputs are crucial to attaining a good harvest. Farmers from far-flung rural areas face difficulty in the procurement of agri inputs. The first challenge is that they have to take a day off to travel to the local market to buy inputs. Here also, in many cases, they are duped by the Agri input suppliers as they sell low-quality seed to the farmers. To allow the farmers more time on the field, one Agri entrepreneur (AE) was identified in every PG in the Kolnara block.



Plate-1: Collective marketing of Brinjal
Photo Credit: PRADAN, JKpur

The AE procures different seeds and pesticides from the vendors at a wholesale price and delivers them to the farmers. The AE also keeps a few pesticides with herself/himself for emergency needs. This intervention not only ensures easy access to agriculture inputs for the farmers but also saves their travel costs. As marketing was the biggest concern among the farmers, linkages with traders and assured doorstep picking up of vegetables were ensured. Linkages with multiple markets were created with AEs using local contacts. The business promoter aggregates the commodities at the village level and sends the aggregated produce to pre-contacted markets. In this entire process, AE has a small margin for herself/himself as profit. This system helped farmers to sell their products easily.

Table 2 : Convergence Figures



Data Source: YPO sheet, FY 2022-23, APC Program Secretariat

Strategy for Promotion of FPO in Kolnara block:

Before the formation of the producer company, the facilitating NGO PRADAN was supporting PGs in a range of activities starting from input procurement to marketing of their products. To make the APC a community-led self-reliant entity, Mahila Pragati Farmers Producer Company Limited (MPFPCL) was registered in the Kolnara block in September 2020 to provide end-to-end support to the 23 producer groups. All the 23 producer groups got associated with MPFPCL and it started receiving services from the FPC. Presently, there are 3000 PG members in the MPFPCL, of which 1800 are shareholders. The FPC has also hired a CEO (Chief Executive Officer) to support in functioning of the FPC and 11 service providers are engaged with the MPFPCL on a commission basis.

Table-3 : Financial progress of MPFPCL.

No of Share Holders	1739
Share Capital	13.70 Lakhs
Turnover	116.16 Lakhs

MPFPCL also engages with Government Dept. like Mission Shakti and OLM for availing credit facilities for SHG members and PG members. It avails quality Agri-inputs at farmers' doorstep by procuring them directly in bulk from companies like VNR, Multiplex, HyVeg, etc. MPFPCL has also promoted service providers who provide farm mechanization-related services to farmers.

The MPFPCL facilitates synchronized production across all the producer groups of the blocks and ensures the marketing of the products. To ensure synchronized production, it prepares a crop sowing calendar and advises the farmers of respective villages to follow the same. To balance demand and supply in the market, it also prepares a crop harvest calendar; thus, looking at the productivity cycle of the crop and it sets the dates for the day and volume of plucking. Accordingly, the service providers are communicated to distribute collection material, and the farmer harvests accordingly. Finally, after completing all transactions at the village level, the CEO gets informed about the procurement and then he coordinates with the mandi.

During the procurement, the selected service provider helps the farmer weigh the product, provides receipt of the goods procurred by the MPFPCL, prepares a standard packet, and makes payment to farmers. Currently, the products of Kolnara APC are being sold at 10 markets, 7 Mandis and across 35 buyers.

Table4 : Achievements of the MPFPCL in FY 2022-23

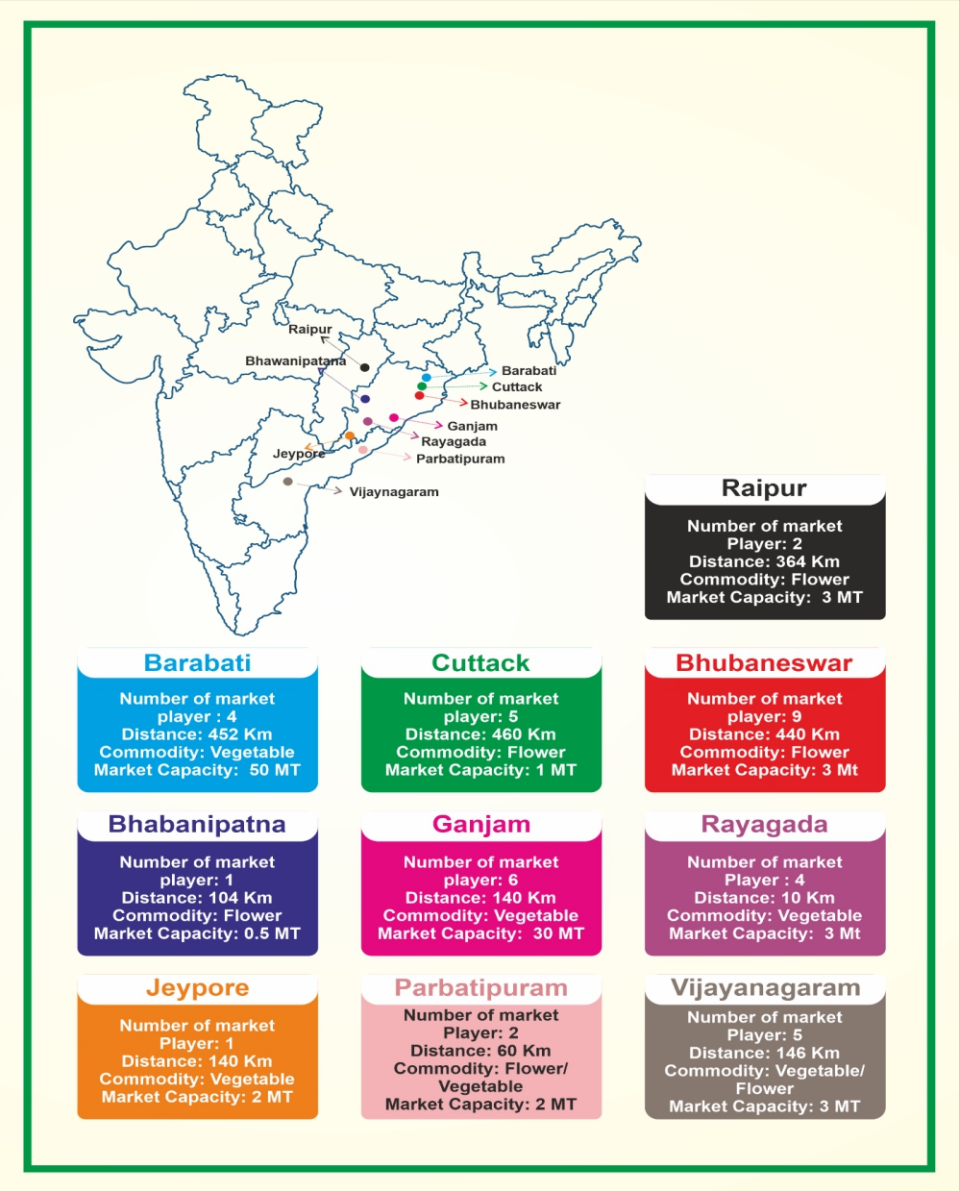
PGs	Families	High-Value Crop Families	The area under High-Value Crop	NPM Area	The area under Fruit Trees	Families with improved Livestock Rearing	Families with access to farm mechanization	Irrigated area
23	3000	2347	1377 Acres	506.5 Acres	733 Acres	1264	1850	376.8 Acres

Data Source: YPO, APC project database

Table-5 : Partnership of MPFPCL with private players

Name of the Private player	Major collaborations
S4S Technologies	• Solar dehydration unit with 30 women of 2 villages • Annual income of Rs 20000/- per season
HESTER	• Association for quality vaccine for Goat & Poultry • Thermostable lasota for remote villages
RUKART	• Sabji Cooler of 1 Q capacity with 10 farmers & treddle pump
Reliance Retail	• Primary stage of supply of vegetables through FPC
SELCO	• Solar energy & business plan for the new initiatives like Solar hatchery & Bio flock.

Fig-4: List of markets linked with the MPFPCL



Outputs and Impact:

In Kolnara Block, the number of households cultivating high-value crops increased significantly from 150 in 2018-19 to 2,347 in FY 2022-23. Similarly, the area under high-value cultivation expanded from 26 acres to 1,377 acres, with the average area under cultivation from 0.17 acres to 0.58 acres(241%). During the same period, irrigation coverage increased from 20 acres to 376.8 acres(1784%), and the area under Non-Pesticide Management practices rose sharply from 15 acres to 506 acres. The number of farmers engaged in livestock rearing also saw a substantial rise, increasing from 150 to 1,264. In FY 2022-23, farmers sold 561 tonnes of high-value crops, generating a total revenue of ₹1.49 crores.

Challenges & Way Forward

The major constraints faced by the MPFPCL are -buyers holding on to payment for a longer duration thus blocking capital; timely purchase of inputs is critical for synchronized production cycles which becomes challenging. The MPFPCL is exploring new markets and product lines to ensure self-sustainability. APC project aims at doubling the income of women farmers. The district administration in Keonjhar, Angul, Jharsuguda, and Sundargarh are now implementing APC projects leveraging resources from District Mineral Funds. As on 31st March 2023, the APC project is working in 72 blocks of 14 districts and has reached out to 2,00000 women farmers.

Case Study:



Muni Heprika is a tribal woman of Karagadi village under the Kolnara Block of Rayagada District of Odisha. Her family owns 4 acres of agricultural land where they used to grow Paddy, Finger Millet, Cotton, and Sunflower.

In the year 2020-21, she earned only Rs. 20,000 from cotton farming which was not sufficient to manage her household expenses.

She joined Maa Gangeidevi Producer Group in the year 2020-21 and her group had decided to do Brinjal cultivation in the Kharif season. However, her in-laws opposed initially, but Muni finally convinced her family to go for Brinjal cultivation in 0.75 acres.
The MPFPCL provided input and marketing services at the doorstep. The collective marketing system helped her to sell all her produce along with other fellow farmers in her village. Collaboration of the Agriculture Production Cluster Program and Mission Jivika of the Integrated Tribal Development Agency also helped her with input and farm implements support. She could earn Rs 75,000 in the first year itself.

In the subsequent year also, she grew Brinjal in 1 acre and sold 8,000 kg of Brinjal at Rs 1.2 Lakhs. Today she is an example not only for her family but also for the village.

DREAMING LARGE OUT OF SMALL RUMINANTS - GOAT REARING

A model devloped by PRADAN

Context:

The Kandhamal district is spread over hilly undulating terrain with a large tribal population; about 66% of the district's land area is covered with dense forests and towering mountains rich in green meadows with altitudes ranging from 600 to 900 m. The district has two subdivisions: Phulbani and Balliguda.

Balliguda sub-division represents the district's southern part- a region rich in forest resources. The main occupations of the communities are rainfed subsistence agriculture and animal husbandry. Animal Husbandry, primarily of small ruminants—Goat & Backyard Poultry rearing, are major livelihoods for most smallholders and landless families.

Though Goat rearing is a traditional activity, viral diseases like Peste des Petits Ruminants (PPR), Enterotoxaemia, and Intestinal worms increase significant risks in production and income; availability of vet services in the villages is limited and increases unpredictability

Features of the Intervention

Ghumsur is the local breed of the region; it is similar in appearance to the Ganjam & Black Bengal breeds and has stout legs, is lean and can easily climb mountains. The breed shows a high twinning rate; an adult buck may weigh close to 30 kg, while a doe weighs about 20kg, yielding about 300 to 500 ml of milk.

Professional Assistance for Development Action (PRADAN) has been working in the region since 2003, collectivizing the community by forming Women Self Help Groups (SHGs). Gradually through participatory appraisals – Goat rearing was taken up as a focussed livelihood with small and marginal farmers from SC & ST communities residing in forest fringe villages.

The key objective of the program was to control mortality and increase productivity through

1. Establishing sustainable service delivery systems, which include deworming, vaccination, and basic medication services
2. Improved rearing and management practices which included improved shelter, improved breeding practices, supplementary feeding, and primary care and hygiene

Key Features of the Program-

Identification of heathy stock of local Goats who are resilient and can survive local conditions and rearing practices.

Promotion and grooming of local youth as Prani Mitra to provide deworming, vaccination, and vet services at the villages.

Starting from even 1 mother goat- through improved care, disease & feed management, and shelter herd size of around 10 to 15 can be achieved in 3 years. Area saturation approach is followed to ensure viability of services.

Stress on self-reliance by promoting locally available nutritious fodder than external feed so that sustainability & replicability is ensured.

Women are at the focus and efforts are there to improve their participation and share of income in household matters.

Income of Rs 30,000 per annum is realized from the sale of Goats.

The goat rearing model was initially demonstrated in 2005-06 in five villages of Balliguda Block, Kandhamal district of Odisha. After the initial success, PRADAN took forward the improved intervention strategies to 4546 families across Balliguda, Daringibadi and K Nuagaon Blocks of the District. Goat rearing is promoted as an integral component of farm-based livelihood intervention strategies under the Agriculture Production Cluster (APC) and Mo Upakari Bagicha programme of Govt of Odisha.



Plate 1- Ghumsur Goats

Photo Credits: Sankarsan Behera, PRADAN

Steps in the Interventions

1. Establishing Sustainable Service Delivery System

In remote villages, there is a challenge to ensure timely vaccination and deworming of goats with existing support from the Animal Husbandry Department. To ensure affordable doorstep delivery of vet services (primarily deworming and vaccination), Community Animal Husbandry Workers (CAHWs) were selected and groomed. They are usually youths selected from the village having minimum education till 7th standard and who have the motivation and aptitude for working with the women farmers in villages. Each CAHW can support 80-100 farmers across a cluster of 3 villages.

The CAHWs are trained to identify the symptoms of the diseases for which vaccinations are ensured. They are provided with some necessary accessories like Vaccine Carriers, First-Aid Kits, basic medicines, Burdizzo, etc. Vaccines & deworming medicines are available with Negi Pahari Producer Company, Balliguda and local veterinary stores. Doorstep services were provided in the morning or evening hours. For goats, deworming etc done either before they go out for grazing or after returning home in the evening. CAHWs can make about Rs 3000 to 6000 per month by providing vaccination and deworming services for goats and poultry birds. Goat rearing was promoted on an area saturation approach targeting about 60-70% of goat rearers in a village. When most goats are vaccinated, the spread of contagious diseases is checked through herd immunity.

After the success of the CAHW model, Odisha Livelihood Mission (OLM), with support from Animal Husbandry Department, initiated cadres of service providers called Prani Mitra (PM) for small ruminants and poultry birds in 2015-16. Under Mission Samriddhi: Gram Panchayats Level Federation have provision to appoint PMs for selected villages. For other Panchayats and villages, CAHWs are providing services through co-ordination at the block level under the guidance of the Block Veterinary Officer (BVO) and Block Programme Manager (BPM) with technical assistance from OLM and PRADAN Professionals to ensure cold chain and timely vaccination of goats.

2. Improved Rearing and Management Practices:

Though mass mortality could be checked through regular vaccination and deworming, other interventions like Nutrition, Housing, Breed improvement, and Preventive and Curative practices were partly ensured for better growth and maximum returns-

Table 1 : Interventions highlights

Interventions	Description
Goat Shelters	Goat sheds are built using locally available materials; the average space required for one goat is 6-8 sqft; raised platform of height 1 m is constructed to ensure that the goats do not come in contact with the dung and urine and easy cleaning is possible. Sheds help the goat to protect itself from inclement weather and predators; it also helps reduce diseases and easy collection of dung as manure. Currently, Goat Shed construction has also been integrated under MGNREGS.
Breeding Practices	Open grazing with limited herds leads to inbreeding depression; thus, timely castration and breeding with local healthy bucks through Buck Exchange are promoted. Does with more twinning frequency and inter-gestation period are taken up as healthy parents for breeding.
Supplementary Feeding	Even though Open Grazing is traditionally practised, supplementary stall feeding of green & dry fodder is provided for pregnant & lactating *goats* to ensure better health and reduce risks. Dry leaves & feed preparations are also given during fodder shortage.
Care & Hygene	Regular monitoring of external parasites (ticks, mites & lice) is carried out and treated; accordingly, weak and diseased animals are segregated and treated to prevent the spread of infections. In peak winter- wood stoves are used to keep the sheds warm.
Empowering Women	Members of Women SHGs are the focus of all interventions and are involved in decision-making in the identification and selection of villages and Prani Mitra, as well as their activity monitoring and payment, scheduling training events and logistics. Exposure visits and several IEC tools were used to trigger members' awareness of vaccine & deworming compliance and better rearing practices.

Fig-1

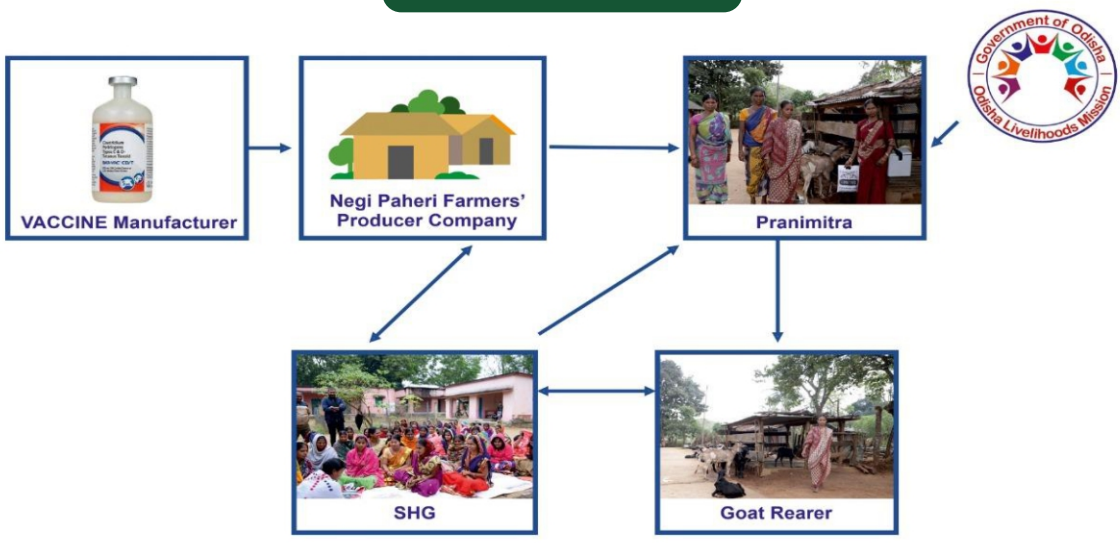


Fig 1: Community Managed Service Delivery System for Goat Rearing



Plate 2- suggested Improved Goat Shed

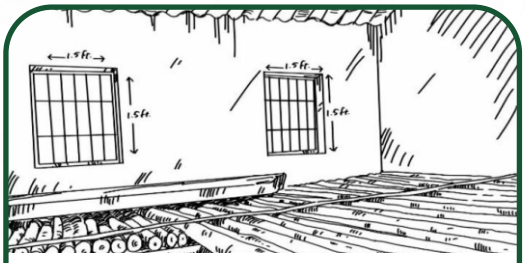


Plate 2 - Suggested Improved Goat Sheds with Raised Platform



Plate 3: Pranimitra groomed



Plate 4: Pranimitra vaccinating Goats

Photo Credits: Sankarsan Behera, PRADAN

Steps in the Interventions

The program has been jointly supported by Odisha Tribal Empowerment & Livelihood Program (OTELP) as well as Navajbai Ratan Tata Trust (NRTT) with PRADAN-the implementing agency providing capacity building, facilitation, and technical support to the community groups.

Table 2 : Involvement of Stakeholders

Stakeholder	Role
OTELP & NRTT	Support for Shed Construction, Supply of Bucks & Does. OTELP- 150 families in 9 villages for purchase of Asbestos sheet & goats; 4 Freezers & Genset NRTT- 110 families in 4 villages for purchase of Asbestos sheets.
PRADAN	Community facilitation, Capacity building of community cadres (Prani Mitras), System setting, Forward & Backward linkages, and Technical Support

Income potential of the model

Most women farmers start with 2 Mother Goats and increase their herd size up to 8; each goat sells for Rs 4000; thus, within two years, the rearer can earn Rs 16,500.

Table 3 : Economics of Goat Rearing

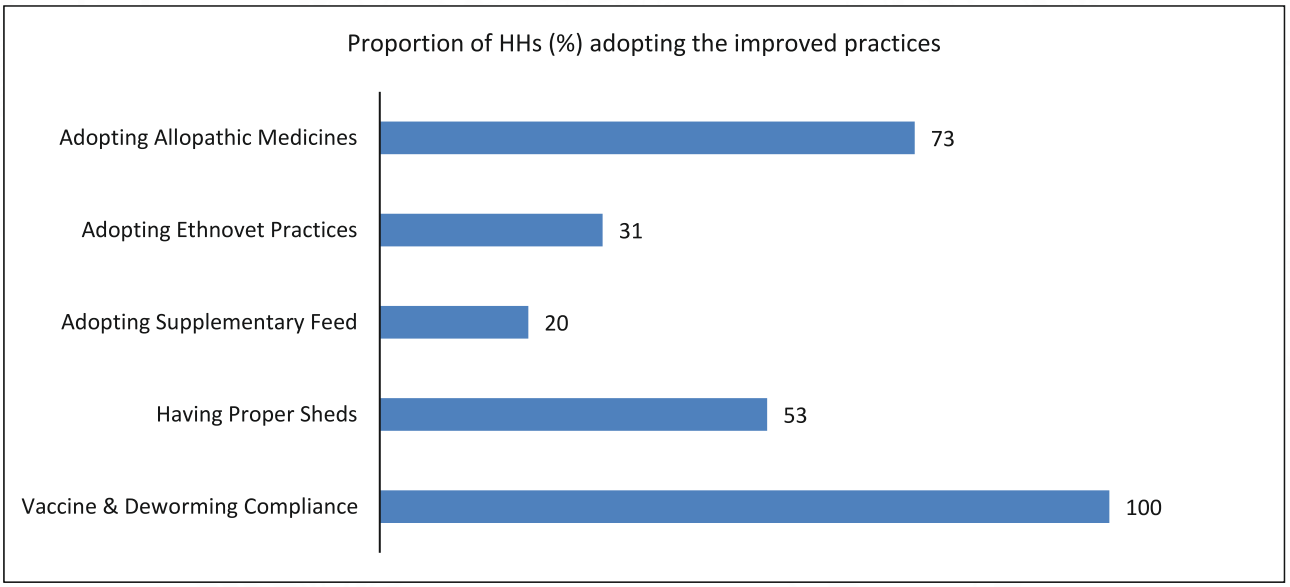
Components	Details	Amount-Rs
Mother Goats	2 self-owned goats initially	
Deworming & Vaccination	Rs 120/goat in 2 years (includes deworming, PPR, Pox, ET & FMD), Total for 8 goats	960
Supplementary Feeding	@ 50 g per day at a cost of Rs 1.50 per Goat; 2 Lactating mothers for 180 days	540
Total Cost		**1500**
Goats-4	@ Rs 4000/goat	16,000
Grower Goat-2	@ Rs 1000/goat	2000
Gross Return		18,000
Net Surplus		**16,500**

Results & scaling up

Since 2015-16, -the Goat Rearing Program was scaled up with the support of OLM and the Department of Animal Husbandry to cover 4546 families across 122 villages in Balliguda, Daringibadi and K Nuagaon Blocks of Kandhamal District.

Almost all families receive timely vaccination, 73% are availing allopathic medicines for treating diseases, and 53% have built proper sheds to house goats.

Fig 2 : Adoption of different interventions across the households in the region



Source: PRADAN, Baliguda

As the demand and price of meat show an increasing trend, the improved Goat Rearing Program can be replicated in forest fringe areas as well as other areas as a part of the integrated farming system where most farmers are landless or have marginal land holdings.

Challenges

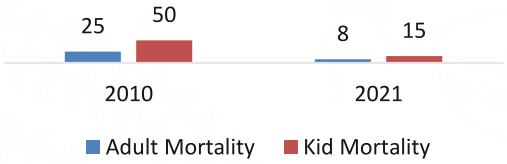
The durability of traditional Goat Sheds made of mud wattle wall is poor and needs reinforcements through timber; though bamboo is a better option, it is not available in large volumes in the region.

Fig-3Impact and outcome

Regular vaccination, deworming, and housing goats in proper sheds reduced child and adult goat mortality. Currently, the adult mortality (blue bar) has gone down to 8% from 25%, while kid mortality (red bar) has reduced to 15% from 50% respectively since the project initiation (2010), as shown in Fig 3-

Fig-3

Change in Adult & Kid Mortality through Interventions

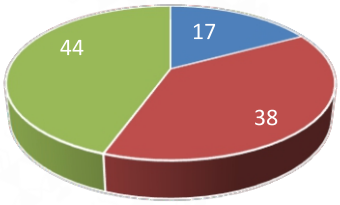


Source: PRADAN, Baliguda

About half of the rearers started with one or two mother goats, after adopting improved rearing practices even after selling - 17% rearers (blue) have a herd size of more than 20 while 38% rearers (red) have between 10 to 20 animals as shown in Fig 4-

Fig-4

Proportion of Rearers (%) having different herd size

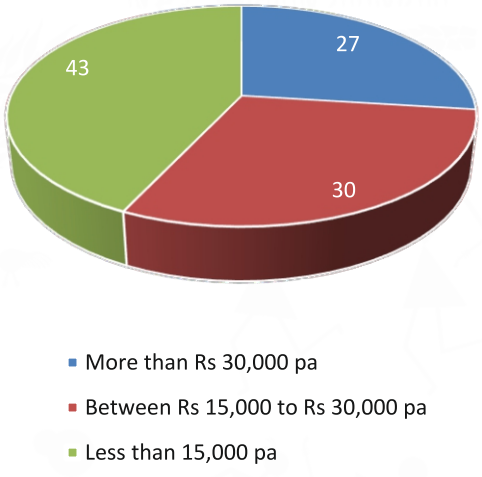


Source: PRADAN, Baliguda

Income levels have also gone up from uncertain returns to an average income of Rs 8250 per year; Fig 4 shows the proportion of rearers in different income ranges-

Fig-5

Proportion of HHs (%) having different income range



A third of the rearers can generate cash flow between Rs 15,000 to Rs 30,000, while 27% have incomes higher than Rs 30,000 per annum.

Raji Digal is a landless farmer from Kateribhata village in Baliguda block of Kandhamal District. She and her husband were dependent on NTFP collection and wage labor as their only form of subsistence. Being a member of the Maa Patakhanda SHG in her village, she participated in several trainings and exposure visits on Improved Goat Rearing and decided to take it up.



Plate-5 Image of Raji Digal

Starting with just 2 does, her herd size increased to 13 (comprising of 7 does, 2 kids and 4 castrated bucks) in 3 years. She earned Rs 30,000 by selling 3 goats and has provided three goats (worth Rs 20,000) to her relatives for rearing.

Raji keeps deworming medicine at her home and administers it regularly; as her herd size is increasing, she has arranged bricks to renovate her existing shed.

Photo Credits: Sankarsan Behera, PRADAN

Innovation and Success Factors

This program has been women-led since its inception. Members of SHGs have identified Goat Rearing as a livelihood vocation and have been at the centre of implementing and managing it at the village level. SHG members have been involved in selecting goat rearers & Prani Mitra and monitoring the program and ensuring compliance and quality through peer pressure. All Prani Mitras are women trained to ensure affordable and timely vaccination, deworming and other services at the doorstep.

Vaccines, Cold Chain & Medicine stock maintenance at the Central facility managed by Negi Pahari Producer Company-Balliguda have also been critical to the program's success.

The Way Forward

Resilient Local races of small animals adapted to the region's rugged terrains and seasonal vegetation have always provided supplementary income to some of the poorest families. This project took advantage of these unique Goat breeds and ensured better care and community-led vet services to reduce the limitations of diseases and mortality. Through timely compliance with vaccination and deworming as well as improved rearing practices, the incomes have increased and instilled confidence and empowered women to bring about social change by providing affordable veterinary services in the village through Prani Mitras. The program has also demonstrated a coordinated effort between the Department of Animal Husbandry, OLM, and Civil Society Organisations -like PRADAN, to ensure the most marginalized families are not left out. Now goat sheds are also constructed through the MGNREGS fund; however, certain principles need to be followed for improvement -

1. The flooring of the shed shouldn't be concrete, 2. Construction of raised beds, at the height of 3-4 feet from the ground, inside the goat shed 3. Proper ventilation needs to be ensured.

Kirma Digal from Kateribhata village, in Baligudda block of Kandhamal District has been rearing goats since her marriage. She had brought 2 goats from her maternal home and within 2 years- the herd size increased to 12, however all her goats succumbed to diseases outbreak in the 3rd year. Being a member of Rudrakali SHG in her village she took up improved Goat Rearing being promoted by PRADAN, following regular vaccination & deworming through CAHWs her herd size steadily increased. Currently she has a herd of 27 goats (comprising of 15 does, 2 bucks, 4 castrated bucks and 6 kids). Kirma also constructed a proper Shed with raised platform to house her herd.

In 2021- she sold 4 goats at Rs 40,000 and invested the same in setting up a Mini Rice Mill which has further added to her household cash flow.



Plate-6 Goat Shed of Kirma Digal



Plate-6 Rice mill of Kirma Digal

Photo Credits: Sankarsan Behera, PRADAN

SUSTAINABLE LIVELIHOODS PROGRAMME FOR ULTRA-POOR WOMEN THROUGH GRADUATION APPROACH

A model devloped by TRICKLE UP

Context:

Odisha experiences multiple vulnerabilities due to diversified social groups, regional disparities, unequal distribution of resources among various caste groups, frequent occurrence of natural calamities, and issues like left-wing extremism. As a result, families experience multiple vulnerable conditions and are often assetless and extremely poor or single-widow-headed households. These disadvantaged families come under the lowest strata of Well Being Grouping, the Extremely Poor and Vulnerable Group (EPVG).

An estimated 20-30% of these EPVG households can be described as ultra-poor households. A lack of productive assets characterizes them along with food insecurity, negligible land holdings, families with differently-abled people and families whose primary income source requires migration. Most of these families are excluded from the community and are not part of community-based organizations or groups, including Self-Help Groups (SHGs). They have very little access to entitlements relating to social security schemes, basic health services, formal primary education, and safety nets under Government Programmes.

The Consultative Group To Assist The Poor Graduation Approach (CGAP) is one of the few models that has been rigorously tested across various countries and has helped to demonstrate a positive impact on people living in ultra-poverty through time-bound, carefully sequenced interventions. The sequencing of the approach is designed to complement safety net protection with livelihood promotion strategies for improved impact and sustainability of interventions for the Ultra Poor.

With its experience in working with more than 5000 households living in ultra-poverty through the CGAP Graduation model in Odisha, Jharkhand, and West Bengal, Trickle Up (TU) has helped demonstrate a positive impact on the life of people living in ultra-poverty. TU's model has specifically targeted these EPVGs and tested methodologies to increase their inclusion based on local learning and from the international learning community of CGAP.

Collaboration between Trickle Up and OLM:

The Odisha Livelihood Mission (OLM) facilitates social and financial inclusion. It promotes sustainable livelihoods for the extreme poor by building "Institutions of the Poor" under the National Rural Livelihoods Mission (NRLM). Trickle Up (TU) has over four decades of experience working with households living in ultra-poverty to promote sustainable livelihoods. As both institutions have a shared vision, there was a scope for collaboration for social inclusion and livelihoods.

Against the above backdrop, TU collaborated with OLM to provide the technical expertise to ensure that households living in ultra-poverty could garner the benefits of social security nets, leverage funds from different financial institutions, and take up diversified livelihood activities for graduating from ultra-poverty. The model has been implemented in the Muribahal block of the Bolangir district with 500 Ultra poor families. Trickle Up has built the capacity of OLM staff, community resource persons, and other stakeholders to undertake the Graduation Approach.

Muribahal is a migration-prone poverty-stricken block, where a significant number of migrant families also happen to be ultra-poor and belong to ST & SC communities. Landlessness, chronic drought-prone uplands, lack of assets for continuity of livelihood activities, and lack of access to social security schemes due to family migration for more than six months in a year have forced ultra-poor families to lose hope to overcome the vicious cycle of chronic poverty. OLM and TU have come together by leveraging the implementation expertise of Lokadrusti, which has been working in Muribahal. The interventions were carried out in the Gram Panchayats of Badasaimara, Chalki, Ichhapada, Gudighat, and Lakhna from FY 2018-19 to FY 21-22.



Plate 1: A meeting ultra-poor households identified under this project in Bijghat village.

Photo Credit: Sankarsan Behera, PRADAN

Problem Statement

OLM has been working with poor EPVGs since its inception. They have found that an estimated 20-30% of the poorest households, those of which come under the lowest strata of economic wellbeing, continue to be left out of program coverage. As a result, it was challenging to include these families in community-based organizations or Self-Help Groups (SHGs) and give them access to program benefits under the social safety net and livelihood interventions.

Implementation strategies

Social Inclusion and Mobilisation through Institution Building:

Program intervention starts by identifying families living in ultra-poverty within the first three months of programme initiation and simultaneously forming self-help groups (SHGs) by organizing the women of these families. There were challenges to cover all women from identified households under SHGs with severe or chronic health problems, differently-abled persons, long-term migration to other areas, non-cooperation by the male household members, and incidence of gender-based violence. All these cases were different, and these individuals needed special attention to encourage them to join SHGs, where they would find peer members belonging to the same socioeconomic category.



Plate 2: A meeting with team members of Lokadrusti NGO to understand the process followed in the identification of ultra-poor households

Photo Credit: Sankarsan Behera, PRADAN

Baseline data of 266 families out of 500 families was conducted to develop a shared understanding of the sources of Income, expenditures, different portfolios of Income, and expenditures.

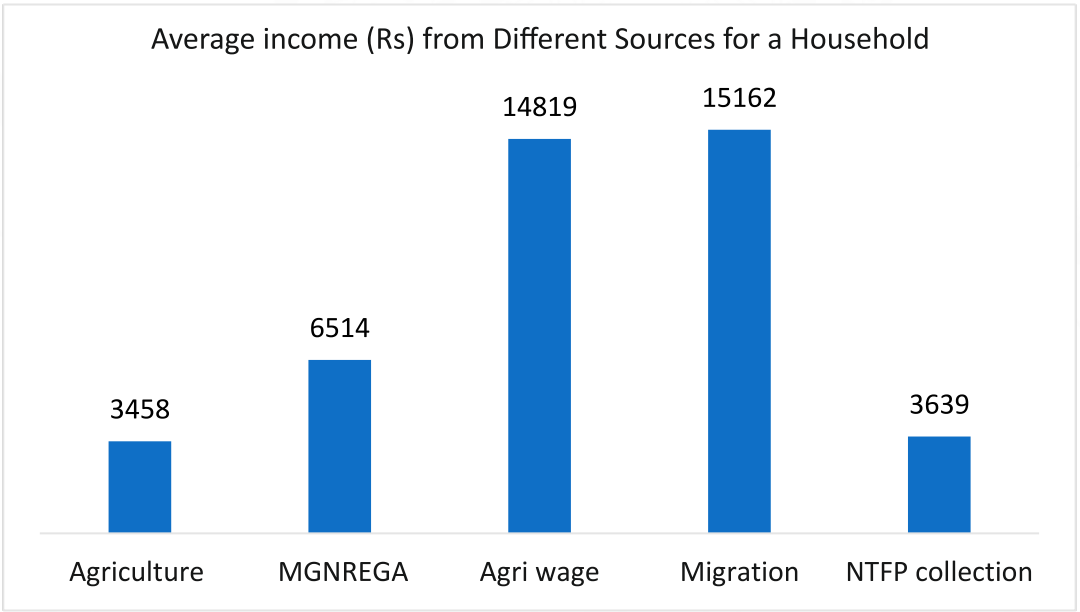


Fig - 1
Source: Trickle Up

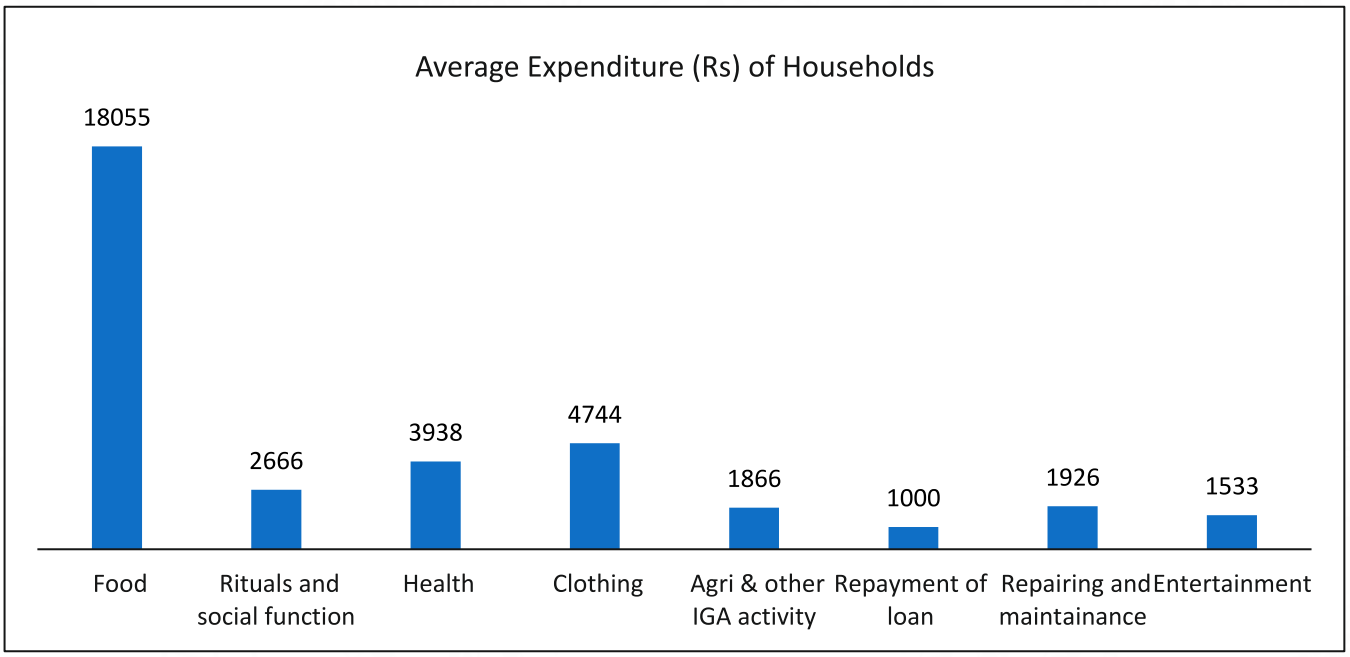


Fig-2
Source: Trickle Up

The average annual Income of the families was Rs 28,649 while the expenses were RS 33,063 ; strikingly 54% of the expenses were on food, and 12% was on health.

Majority of Project Participants (PPs) were landless; a few had less than an acre of unirrigated uplands. A household having 0.5-1-acre land could grow Paddy to feed a 5-member family for 3-5 months

There was an understanding that MGNREGS was the readily available source of wage-earning. Hence there were interventions to increase participation under MGNREGS. Regular interaction for confidence building and creating scope for wage work through MGNREGS and PRIs helped them gain confidence and gradually motivated them to join SHGs. Early livelihood interventions were also started with them at the same time. In addition, the provision of Old-Age Pensions and other entitlements helped them be included in the social security net.

This organizing process took at least six months to stabilize. These SHGs, then join Cluster-Level Forums (CLF) at the village level and further become members of Gram Panchayat-Level Federations (GPLFs) with all SHGs once they are formed under OLM guidelines.

TU trained and facilitated CRPs in effective and timely handholding and coaching of participants from vulnerable groups in SHGs and federations to ensure 100% inclusion and participation in the program and proper representation in CFLs and GPLFs. Implementation of social protection schemes was facilitated through sensitizing community institutions. Regular savings and credit helped SHG members meet the consumption needs. In addition, the credit linkage of SHGs with banks was done for the scale-up of livelihood activities. Timely repayment habits made SHG members more creditworthy.

Livelihood Promotion:

Livelihood planning for each household started once SHGs were formed. Considering the contextual realities, livelihood activities were chosen based on participants' assets and strengths within the social and market norms. Provisioning 60 days of consumption support in the project's first year supported them to tide over the difficulties in the lean period.

The livelihood intervention matrix focused on promoting low-risk vegetable cultivation, small livestock rearing, and small business enterprise development, especially for landless households. This initiative could easily link with local markets and existing local value chains to ensure income. Emphasis was given to the promotion of diversified livelihood activities from the very beginning. They started with one activity first. But, gradually they were facilitated to take up diversified sources of income. This ensured participants could sustain their income-generation initiative and address challenges and risks associated with any of the income-generation activity.

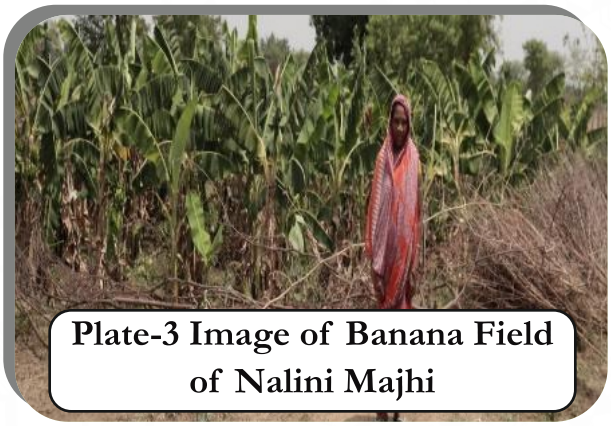


Plate-3 Image of Banana Field of Nalini Majhi



Plate-3 Image of Goat Shed of Nalini Majhi

Photo Credit: Sankarsan Behera, PRADAN

The asset transfer process started within 6-7 months as per the livelihood activity plan. Skills training was imparted once the livelihood planning got completed. Asset transfer and initiation of income-generation activity were started side by side. Asset transfer was done through SHGs and through opening individual bank accounts for them.

Whole Planet Foundation provided Rs. 14,000/- to each Project Participants (PP) for asset building and diversified livelihood activities. This funding entails providing support cost of agriculture inputs, ring well, pump set, fencing, and land on lease, sprayer, goat, poultry & goat shed, and setting up different micro-enterprise.

Regular mentoring with handholding support was provided once the women started their livelihood activities. Credit linkage with formal financial institutions was initiated for scale-up and diversification of livelihood activities. CLFs monitored this process under the guidance of the GP-level Federation of SHGs.

Key Interventions

Adaptation of the following significant components of the graduation model added value to the social and economic inclusion of the targeted households:

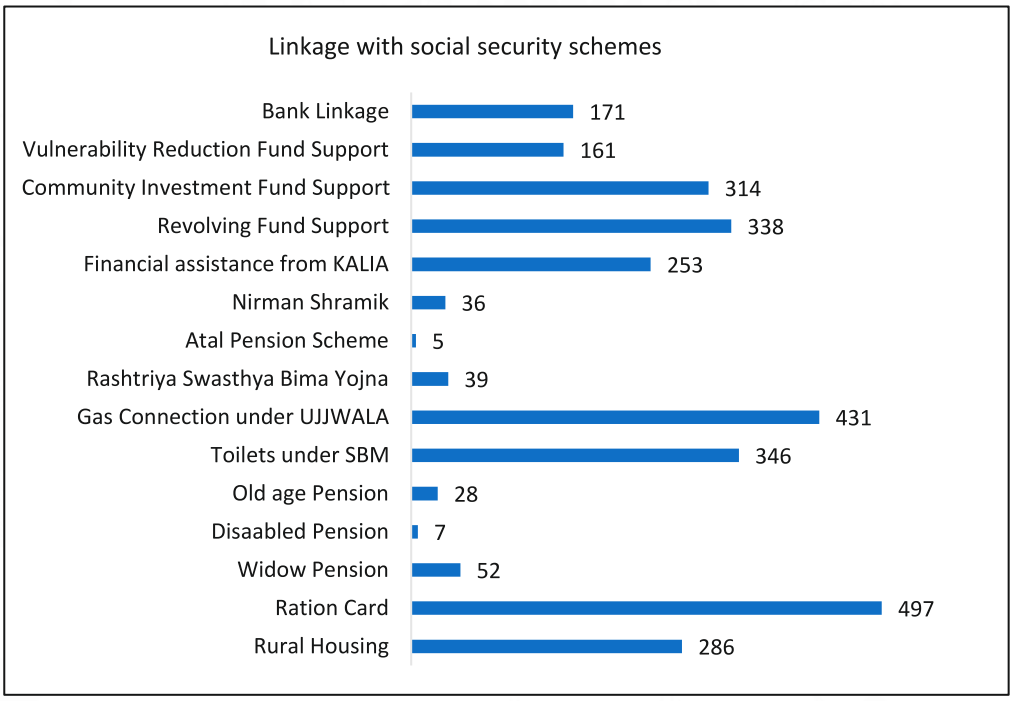
1. Households living in ultra-poverty through tested poverty assessment tools were selected. Most of the villages having more than 70% ST & SC population were identified for poverty assessment. The use of Participatory Rural Appraisal (PRA) tools, Poverty Assessment Indicators, and overall prioritization of the families as per acuteness of poverty are the key features of the selection process. The whole process was conducted with community participation through a transect walk, social map, wealth ranking, and taking inputs from the Gram Panchayat representatives with the active involvement of OLM cadres, Anganwadi workers, and field staffs of Lokadrusti. After a proposed list was generated 20% of the names were randomly checked by a committee comprising the Block Development Officer, Block Programme Manager, and State Programme Officer of TU. Following a rigorous process, 500 ultra-poor households were identified from 3000 households. Women were identified as the Project Participants (PP) as they were most affected.
2. Ensuring food security and other entitlements through convergence with social security schemes of the government. Ultra-poor families don't have food security from their own cultivation: they depend on PDS and/or buy rations from the market. Also, MGNREGS was identified as the most assured source of livelihood. For accessing any scheme Aadhaar card and bank account opening in the name of the women was the foremost intervention. There was an effort to link a maximum number of women as per eligibility under rural housing, PDS, pension schemes, Ujjala, Swachh Bharat Abhiyan, financial assistance under KALIA Yojana, and leverage of credits under various schemes of OLM.
3. The needs of these women were effectively addressed through providing individual attention and handholding support to these households and motivating women to get organized through SHGs. After baseline data collection, it was found that 292 households were migration sensitive; both men and women used to migrate to Raipur, Hyderabad, or Chennai for 6-9 months in a year. There was sustained effort by the CRPs of the OLM to talk to women in one-to-one situation, listen to their difficulties, invite them for exposure to other SHGs, Cluster Level Forums (CLFs), and also motivate women to form their own SHGs or else join any SHGs nearer to their home wherever possible. Once they joined SHG they were called as Project Participants(PP) under the Ultra poor Project. By joining SHGs PPs have been able to continue saving and credit activity, access revolving funds, community investment funds, and Poverty Reduction Fund provisions under OLM. They have also availed services of Prani Mitra (PM) and Krishi Mitra (KM) for their agriculture and livestock interventions. They benefited from a massive awareness drive against the spread of COVID19, vaccination, and COVID packages from the Central and State Govts.
4. The livelihood plan of each family was developed considering their individual family needs and resources and assessing the social and market norms. Agriculture, livestock, and small business were the 3 categories of livelihood interventions that were promoted. Under agriculture, creation of irrigation assets like Ring Well, and support costs for seeds were provided. Under livestock rearing, construction of low-cost Goat Shed, distribution of Mother Goats and Local Poultry Birds were done. Under the small business category, Bamboo craft making, Broom making, Dry Fish vending, Fancy shop, Grocery shop, Poultry shop, Puffed rice vending, Small Hotel, Spice vending, and Vegetable vending activities were supported. The total grant support available to each woman was Rs 14,000. The additional cost was borne by the participant through their labor and financial contribution. For the construction of a Dug Well (6 feet diameter & 25ft depth) cost of construction comes to around Rs 29,000. The participant contributed towards labor costs worth Rs 15,000.

Results:

Most of the Ultra poor families, which were earlier left out of the major Government programs, have been linked to appropriate schemes. Inclusion of the Ultra-Poor into social security programs increased the assurance for them to aspire a life to survive and take care of their near and dear ones. There has been sustained effort to include the ultra-poor with available programs and schemes.



Fig 3: List of government social security schemes available for ultra-poor households.



Source: Trickle Up

Out of 500 families--497 PPs have been included under the PDS card and 431 PPs received Ujjala gas connection. The most significant linkage has been under rural housing for 286 PPs. Under widow pension, old-age pension, and disability pension all total 87 PPs have been linked. Bank linkage, Vulnerability Reduction Fund Support, Community Investment Fund Support, and Revolving Funds were provided to 646 PPs. This shows the reach of the NRLM schemes to the Ultra poor which was otherwise impossible for them to access.

During interaction with 8 out of 13 PPs from village Lakhana, it was learnt that PDS card was a top requirement for them to feed their family. At the same time, their 2nd most need was a Job card under MGNREGS so that they could get wage-earning opportunities under MGNREGS in their villages. Also, assurance to survival has increased due to access to schemes like KALIA which provides Rs 5000 for each landless family for Agri allied activity per annum. Under PM KISAN some of the families have accessed Rs 6000 last year. Again, Govt of Odisha distributed a Biju Swasthya Bima card to every household which they can use for bearing hospitalization costs up to Rs 5 lakh for a member of a family and up to Rs 10 lakh for women member of the family.

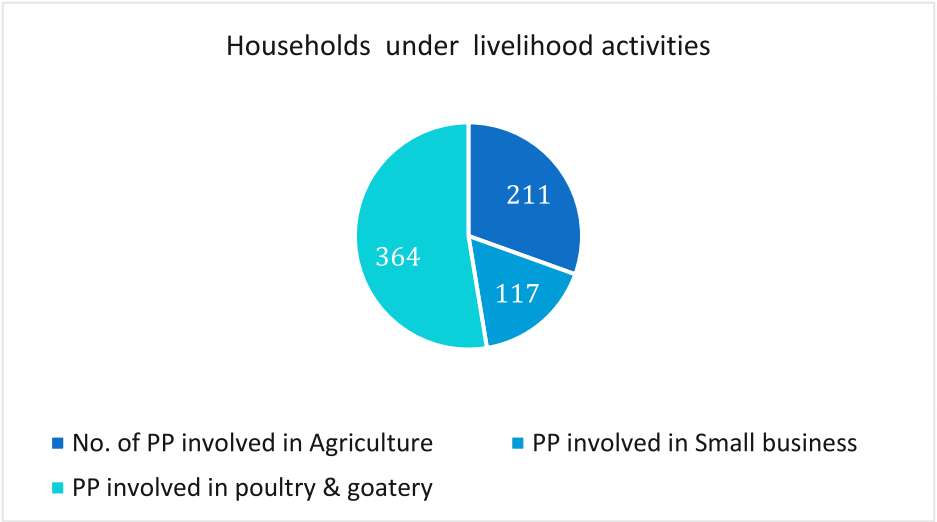
However, the enrolment under Atal Pension scheme was low and it was also observed that toilets under SBM were not operational as desired. With the active involvement of Anganwadi and CRPs all members have been vaccinated. Pregnant, and lactating mothers, as well as children, are attending the VHND camp in the village. When asked about means to access flagship government programs and schemes, all 8 women showed their Aadhaar card, bank passbook, job card, PDS card, and Biju Swasthya card.



Plate 5: Saraswari Kumbar, a beneficiary of this project from Bijghat village of Muribahal block, is showing entitlement cards relating to social security programmes.

Photo Credit: Sankarsan Behera

A total of 499 out of 500 PPs have participated in livelihood activities namely – livestock: 364 PPs, 211 PPs under agriculture and 117 PPs took up different non-farm enterprises.



Source: Trickle Up

Impacts and outcomes

- A diversified livelihood approach resulted in enhancing the Income of PPs. This showed a direct correlation with reducing migration e.g- in 2018, about 217 families were migrating compared to 77 families in 2022.
- There has been a transformation in Household consumption patterns and an increase in dietary diversity due to the consumption of fruits and vegetables around the year through the promotion of nutrition gardens.

Success factors

Continuous handholding through a comprehensive curriculum imparted through frontline workers helped sustain the livelihood activities taken up by PPs.

Challenges

The Covid-19 pandemic threw multiple challenges to the smooth functioning of SHGs and curbed the mobility of the project team to a considerable extent.

- Targets for linking the participants to different social protection schemes have partly been achieved. However, lack of awareness of the participants about the social entitlements, non-cooperation from PRI members, political pressures, etc., were key challenges to ensuring the entitlement.
- Promoting the nutrition garden proved viable for building the resilience of PPs, especially those who faced reverse migration due to an upsurge of pandemics nationwide. However, key challenges in promoting the nutrition garden initiative included a lack of cultivable space as most participants were landless. Water scarcity/absence of irrigation facilities and participants' less knowledge of vegetable cultivation were other challenges.

Lessons learned

A sequential approach to poverty reduction through graduation helped to bail out ultra-poor women from the poverty trap. Methodical, comprehensive, need-based mentoring and coaching by frontline workers built the community's confidence and skilled them for income enhancement. Participatory Rural Appraisal was an effective tool for selecting ultra-poor families, and it was used extensively. Developing customized and diversified livelihood plans based on need, skills, and market access proved to be a successful tool for poverty reduction.

Sustainability:

As the PPs have joined SHGs and their higher-tier forums, they are accessing savings and credit services, bank linkages, and livelihood programs under various programs. Community cadres, Anganwadi workers, and PRI members are now sensitive to the need of PPs. Selected leaders from PPs have started participating at Gram Sabha, and GP meetings to put forth their needs; they have initiated livelihood activities like goat and backyard poultry rearing, small-scale vegetable farming, and starting small businesses like vegetable vending. TU and OLM have conducted multiple sensitization events with GP, Block officials concerned with PPs, to bring about sustainability and serve the purpose of PPs to be more assured of living and working in the villages as per their choices.

Replicability:

The model is replicable by converging the resources from NRLM and other philanthropies and investing in community mobilization through CSOs with the passion and vision to work with the ultra-poor to make them assertive in life. Key interventions like linkage with social security schemes, bank linkages, and income generation Plate 5: image of Meeta Bagactivities are now available under Central and State Government programs.

Adding diversity to escape poverty



Plate 6: Image of Meeta Bag

Meeta Bag is a resident of Khaliapali, a remote and underdeveloped village in the Muribahal block of Balangir known for its high migration rates. Meeta and her husband relied on daily wage labor and migration to make ends meet. However, their situation took a turn for the worse when her husband fell ill, and they had to borrow Rs. 15,000 from a moneylender at a monthly interest rate of 10% to pay for his treatment.

To repay the loan, Meeta and her husband migrated to Hyderabad, where they worked on construction sites and earned Rs. 20,000. Upon their return, Meeta joined Jai Maa Metakani Self Help Group (SHG), which was facilitated by Trickle Up.

Meeta created a livelihood plan to cultivate vegetables and raise goats. However, she required Rs. 11,500 for this endeavor. She obtained Rs. 5,000 from the Kalia Yojana, Rs. 5,000 from the Community Investment Fund (CIF), and Rs. 1,500 from the Revolving Fund. Additionally, Trickle Up supported her by providing five poultry chicks. Using the profits from vegetable sales, Meeta established a nutrition garden and bought two goats. She also constructed a sturdy home under the Prime Minister Awaas Yojana (PMAY) and received a new job card. Furthermore, the Whole Planet Foundation helped her dig a ring well.

Thanks to these initiatives, Meeta can now lead a decent life, send her children to school, and support her family. She is grateful for the support she received and is happy with her current situation.

Kaushalya Majhi belongs to the ST category and used to migrate to Secundrabad along with her husband and son to work in brick kilns. Her son also used to migrate for work on construction sites in Chennai. They used to work there for 6 months and could save all total Rs 15000-20000 after food and other expenses. During work, they would have lived in unhygienic conditions with the constant threat from the contractor who did not pay adequately at the same time asking for hard work at the sites.



Plate 7 :
Image of Kaushalya Majhi

When Kaushalya came in contact with the TU team, she was motivated to join the SHG program and start a livelihood activity. She joined Dhanalaxmi SHG in 2018 and started working under MGNREGS. Later she made up her mind to start a grocery shop and was assisted by TU to start the venture despite having 10 shops already in the village. Currently she is able to sale groceries valued Rs 2000-2500/day with a profit margin of 10%. Kaushalya is now very happy. Her son is married and working in the villages as a mason. Her daughter-in-law assists her in the shop. She says "Trickle Up brings all hopes in my life, otherwise, life was painful each day"

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State Office :
H-6, Badagada Brit Colony,
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Odisha 751018

Head Office :
A-22, 2nd Floor, Sec-3,
Dist: Gautam Buddha Nagar,
NOIDA, Uttar Pradesh - 201301
Tel: 0120-4800800