

2024-2025



Intensive Agriculture Program Including Revival and Sustainable Intensification of Forgotten Crops

Implemented by OSVSWA

in collaboration with ICARDA and ICRISAT and supported by Department of agriculture and farmer's empowerment, Govt. of Odisha

CGIAR Institution : International Center for Agricultural Research in the Dry Areas (ICARDA) & International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)

Table of Content

Introduction	01
Partner Details	02
Objectives	03
Geographical Coverage	05
Timeline	06
Traditional Practices	07
Major Crops	08
Seed Supplied	10
Major Interventions	15
Data Collected	22
Outcomes	23
Impact	29
Success Stories	32
Acknowledge	41





INTRODUCTION

The Intensive Agriculture Program (IAP) under the Crop Diversification initiative focuses on promoting Arhar (Pigeon Pea) and Field Pea cultivation in Odisha. This project aims to enhance agricultural productivity, improve soil health, and ensure nutritional security while diversifying the cropping system. The initiative is part of the state plan for 2024-25 and is being implemented through cluster-based demonstrations across various districts.

The program's primary focus is on sustainable intensification of forgotten crops like Kandula (Wild Arhar) and Dangarani (Rice Bean). These efforts align with the broader goal of increasing farmers' income, reducing dependency on paddy cultivation, and fostering climate-resilient agriculture.

Implementing Partner



ICRISAT (International Crops Research Institute for the Semi-Arid Tropics) develops climate-smart, nutritious crops like chickpea, pigeonpea, groundnut, sorghum, pearl millet, finger millet, small millets, and oilseeds to support dryland farmers. In India, it works with the Government, ICAR, universities, and CSOs on soil health, water use, seed systems, and market access. In Odisha, it partners with the Government and CSOs on regenerative agriculture, carbon farming, irrigation innovations, and the Bhoochetana program to improve soil health, promote sustainable practices, and raise farmer incomes and nutrition.



ICARDA (International Center for Agricultural Research in the Dry Areas) works in 50 countries to strengthen dryland farming with resilient crops, improved water use, land management, and livestock systems. In India, it partners with the Government, ICAR, universities, and CSOs to advance climate-smart agriculture. In Odisha, it works with these partners to support irrigation, promote pulses and grasspea in rice fallows, establish seed hubs, and revive lesser-grown crops, helping farmers improve incomes, nutrition, and resilience.

Field Execution Partner



The Orissa State Volunteers and Social Workers Association (OSVSWA), founded in 1980 and rooted in Gandhian principles, works across the state of Odisha to empower marginalized and tribal communities through agriculture, farmers' empowerment, youth engagement, education, environment, and policy advocacy. For the past seven years, it has been a key partner of ICRISAT and ICARDA, helping scale regenerative agriculture, carbon farming, irrigation, soil health, pulses in rice fallows, and seed hubs. By linking global research with local action, OSVSWA strengthens farmer livelihoods, nutrition, and resilience across the state.



Objectives



01.

Promotion of sustainable agricultural practices to enhance soil health and increase organic carbon content.



02.

Expansion of Pigeon Pea (Arhar) and Field Pea cultivation by introducing high-yielding and resilient varieties.



03.

Improvement of crop yields through targeted crop demonstrations and adoption of best agricultural practices.



04.

Development of seed hubs to ensure the availability of quality seeds for Pigeon Pea and Field Pea.



05.

Establishment of market linkages to improve the profitability and market access for farmers cultivating forgotten crops.



06.

Capacity building of farmers in seed production, sustainable farming techniques, and post-harvest management.



CRFM X SDG

SDG 1: No Poverty – Improving farmer livelihoods through higher income, food, and nutrition from crops in rice fallow areas.

SDG 2: Zero Hunger – Boosting food security and dietary diversity with pulses and oilseeds.

SDG 5: Gender Equality – Ensuring 30% women beneficiaries with access to seeds, training, and income opportunities.

SDG 8: Decent Work & Growth – Creating jobs via farm activities, seed systems, and local agencies.

SDG 12: Responsible Production – Promoting regenerative farming, bio-fertilizers, and soil health restoration.

SDG 13: Climate Action – Reducing soil erosion, conserving moisture, and protecting fields through crop cover.

SDG 15: Life on Land – Supporting soil health and sustainable land use.

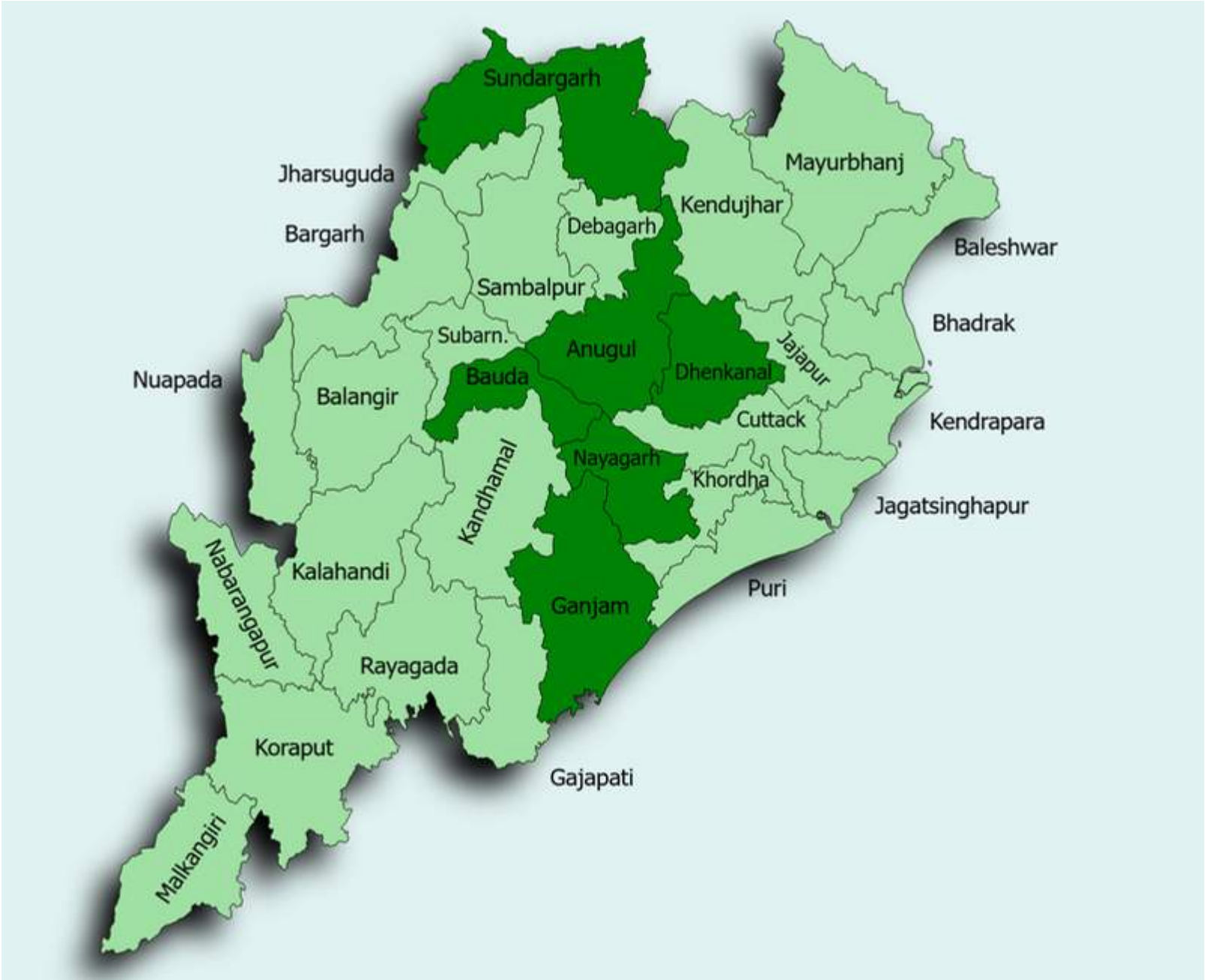
SDG 17: Partnerships – Working with government, CGIAR, and local organizations to deliver impact.

Geographical Coverage

OSVSWA is implementing the Intensive Agriculture Program (IAP) under the Crop Diversification initiative across 6 districts of Odisha, Sundargarh, Deogarh, Angul, Nayagarh, Ganjam, and Baudha. Working in 23 blocks, 174 gram panchayats, and 330 villages, the program has already reached 7,198 farmers.

Through cluster-based demonstrations, OSVSWA is promoting Arhar (pigeon pea), Field Pea, and forgotten crops like Kandula (wild arhar) and Dangarani (rice bean). The focus is on sustainable intensification, crop diversification, soil health restoration, and nutritional security, while reducing over-dependence on paddy.

By connecting farmers with improved seeds, training, and climate-resilient practices, OSVSWA is strengthening livelihoods, boosting incomes, and building a more sustainable and nutrition-secure farming system across the state.



Districts

6



Blocks

23



GP

174



Villages

330



Beneficiaries

7198



Crops (Variety)

1



Timeline

- Procurement and Supply of Seeds and Inputs
- Orientation and Training for the Farmers
- Seed Sowing and Planting

- Post-Harvest Products Management
- Market Linkages
- Annual Report on the Project Activities

June-August
Q1

Sept-Nov
Q2

Dec-Feb
Q3

Mar-May
Q4

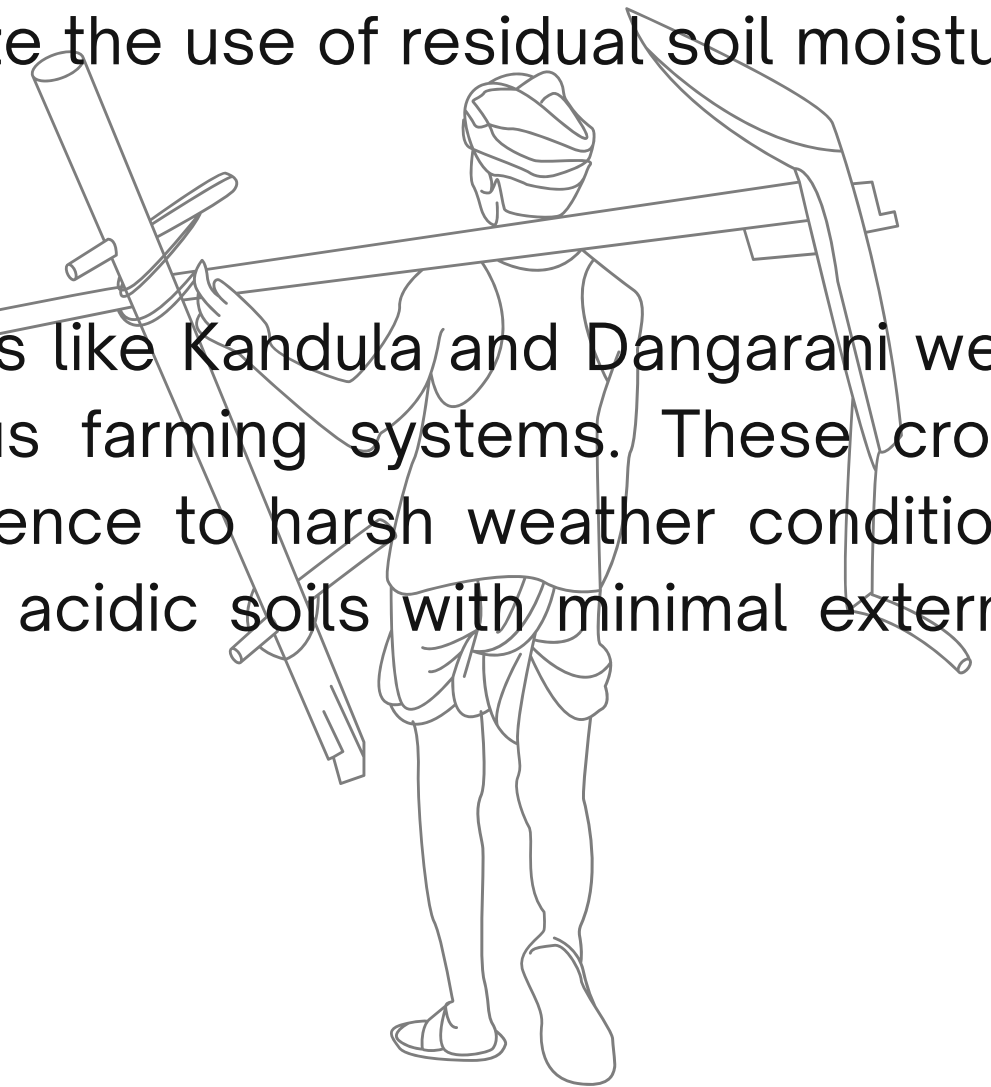
- Project initiation
- Awareness campaigns at Gram Panchayat levels
- Soil sample collection and analysis

- Monitoring and Reporting
- Organization of Farmer Field Days and Crop Cuts
- Harvest

Reviving Forgotten Crops for Resilient and Sustainable Farming

Historically, paddy has been the dominant crop in Odisha. However, with self-sufficiency in rice production, diversification into pulses and legumes has become crucial. Traditional knowledge combined with modern techniques is being leveraged to maximize the use of residual soil moisture and increase productivity.

Additionally, forgotten crops like Kandula and Danganani were once integral to indigenous farming systems. These crops were valued for their resilience to harsh weather conditions and their ability to grow in acidic soils with minimal external inputs.



Major Crops Cultivated



Arhar (Pigeon Pea):
FPVST (Kit.53), ICPV 21333
ICPV 22333, KRG-33
LRG-52, PRG-176, TDRG-59
TS3R, WRGE-93 (Warangal / ICRISAT)
WRGE-97 (ICRISAT), WRGE-121
WRGE-255 (Warangal)

Field Pea:
RKL14-20, IPFD-
12-02

Forgotten Crops:
Kandula (Wild Arhar), Dangarani
(Rice Bean)



Weedicide and Fertilizers

01

Prophylactic treatment with *Trichoderma viride* (15 gm/kg seed) reduced soil-borne fungal threats, while *Rhizobium* (9 ml/kg seed) and PSB (2L/Ha) cultures improved nitrogen fixation and phosphorus mobilization.

Pest Management

02

A tiered pest management strategy deployed Chlorpyrifos-Cypermethrin (1L/Ha) and Emanectin Benzoate (250 gm/Ha) for broad-spectrum control, while reserving Chlorantraniliprole (120 ml/Ha) and yellow sticky traps (15/Ha) exclusively for seed production.

Disease Management

03

Prophylactic treatment with *Trichoderma viride* (15 gm/kg seed) curtailed soil-borne fungal threats, while *Rhizobium* (9 ml/kg seed) and PSB (2L/Ha) cultures synergistically enhanced nitrogen fixation and phosphorus mobilization.

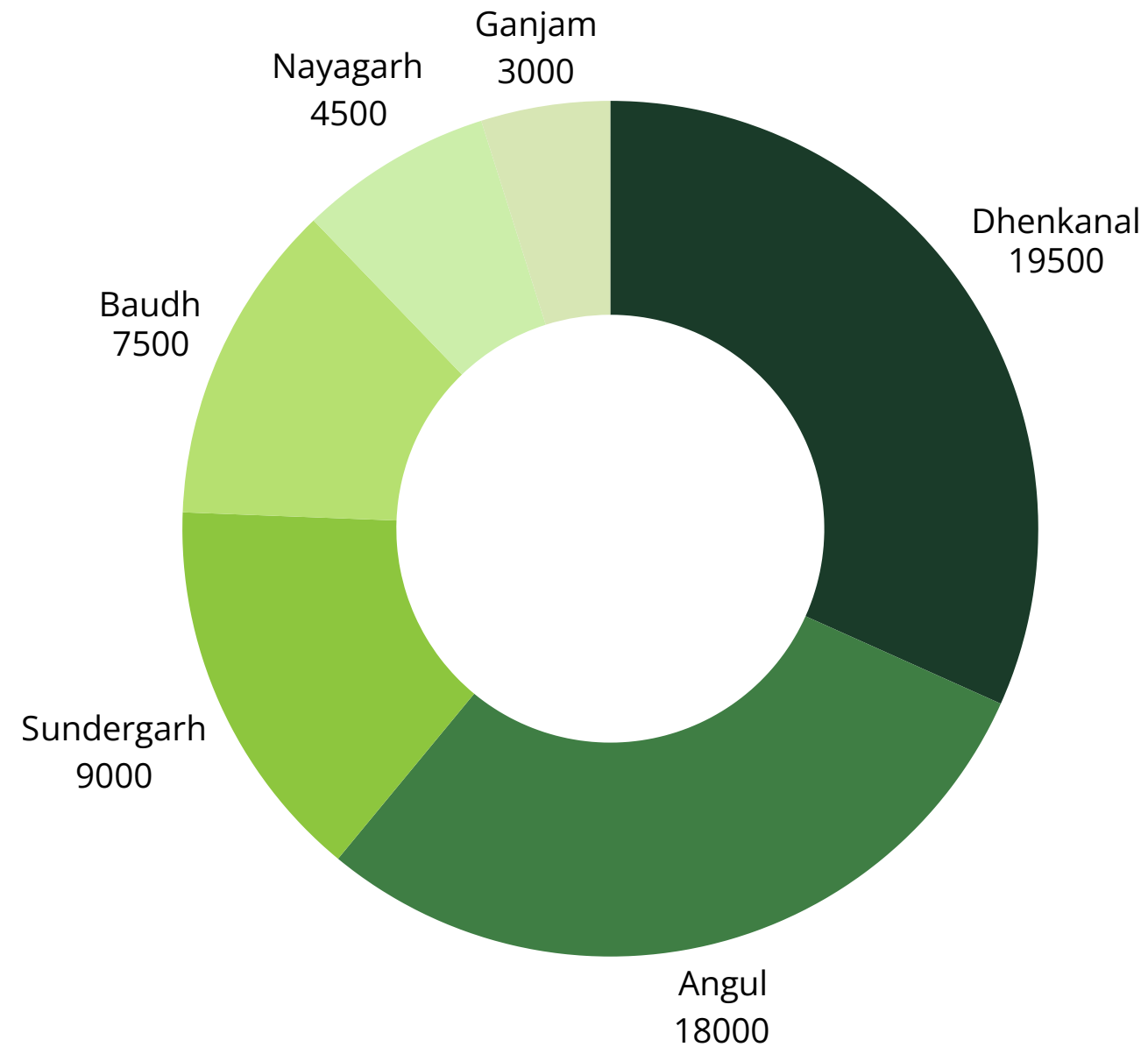
Agricultural Inputs

This integrated system of soil empowerment and pest monitoring exemplifies a transformative approach to sustainable agriculture, where ecological stewardship and farmer prosperity work in synergy.

This balance between nature's mechanisms and human intervention offers a replicable blueprint one where agricultural productivity doesn't come at the expense of environmental health, but rather, sustains it. Farmers become custodians of their ecosystems while securing their livelihoods, proving that ecological harmony and economic viability can and must coexist.

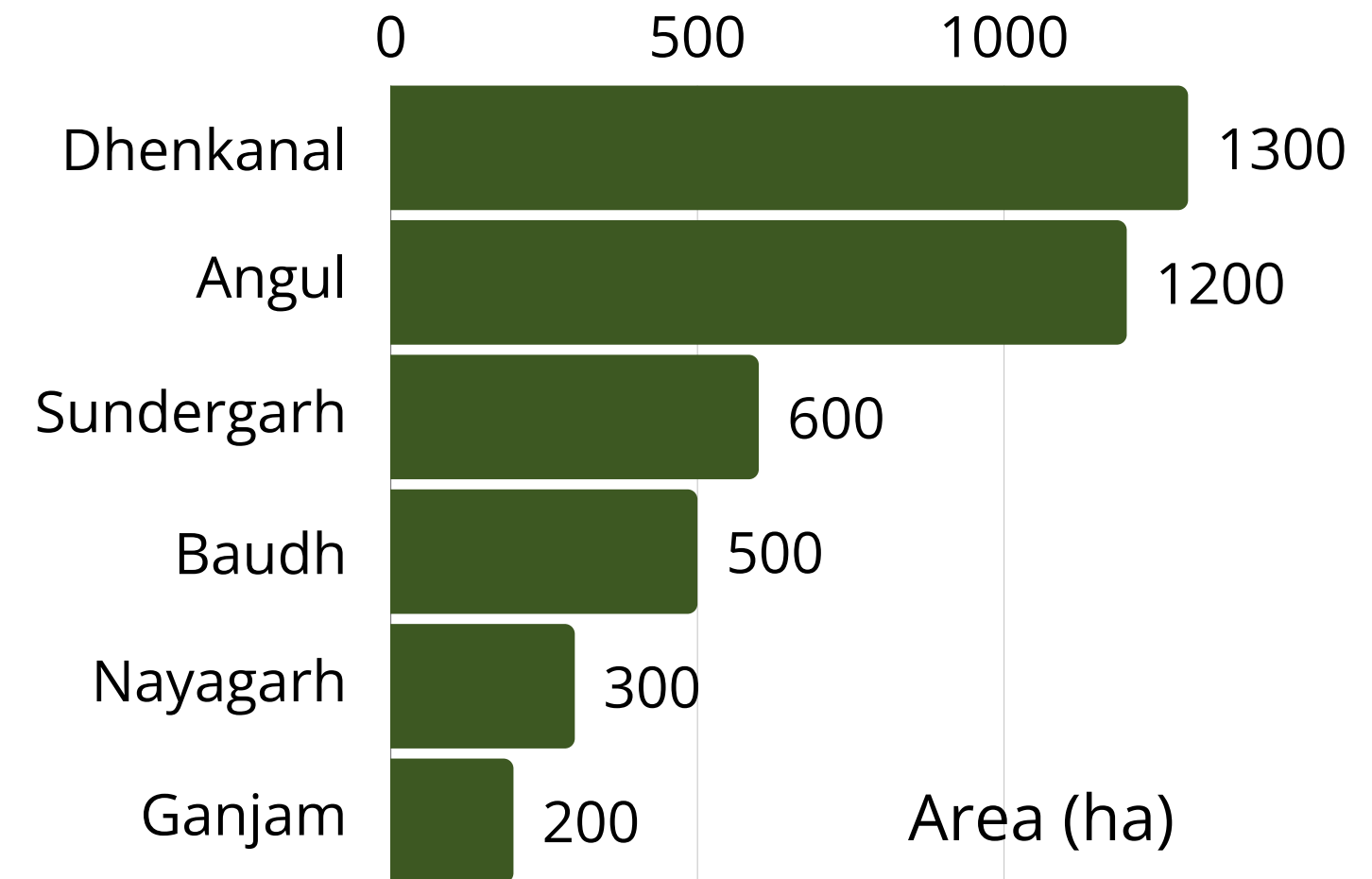
Seeds supplied and Cultivated Area for various crops

Seed Supplied (Kg)



Total Seed Supplied: 61.500 kg

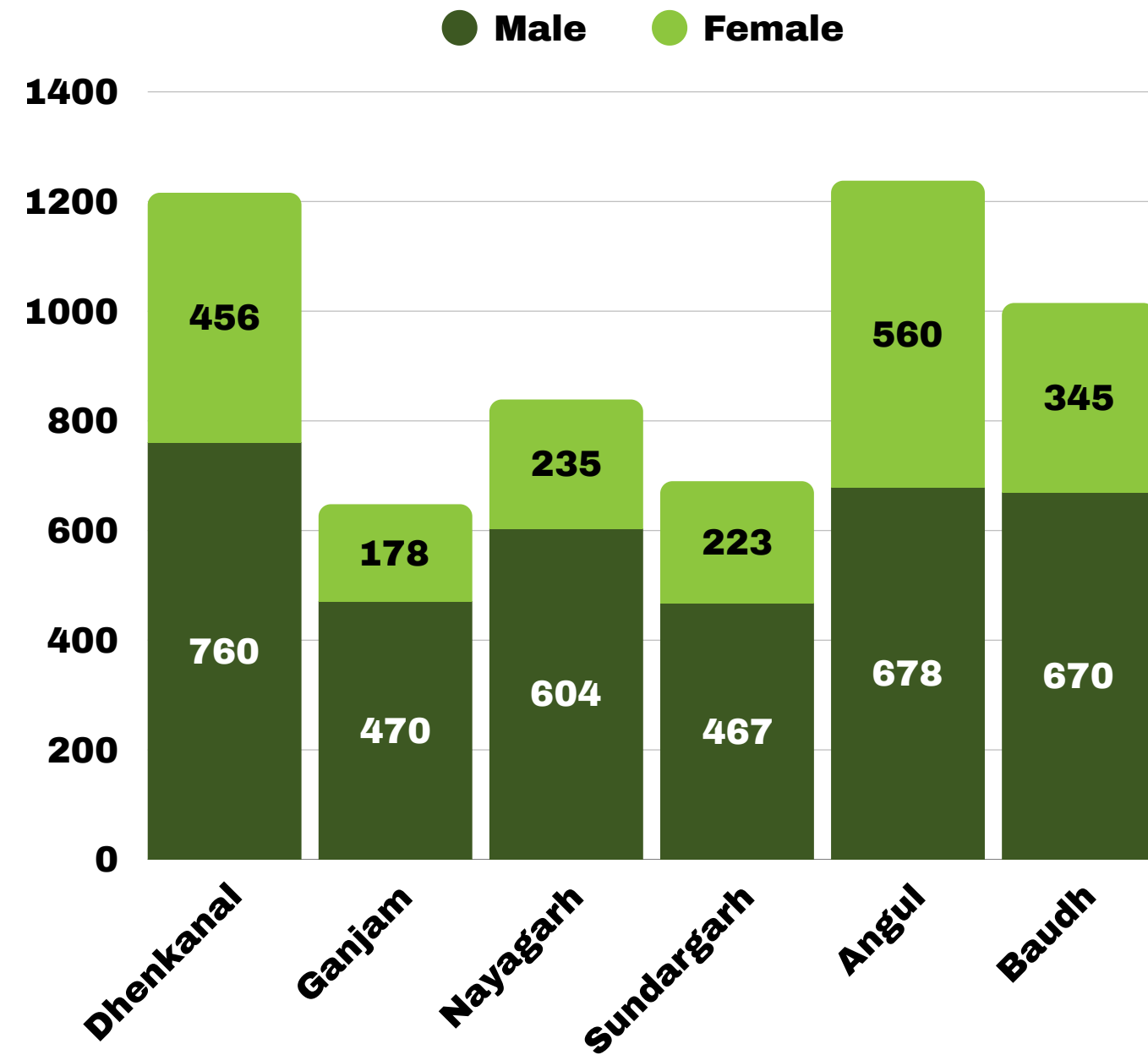
Cultivated Area (ha)



Total Covered Area: 4.100 ha

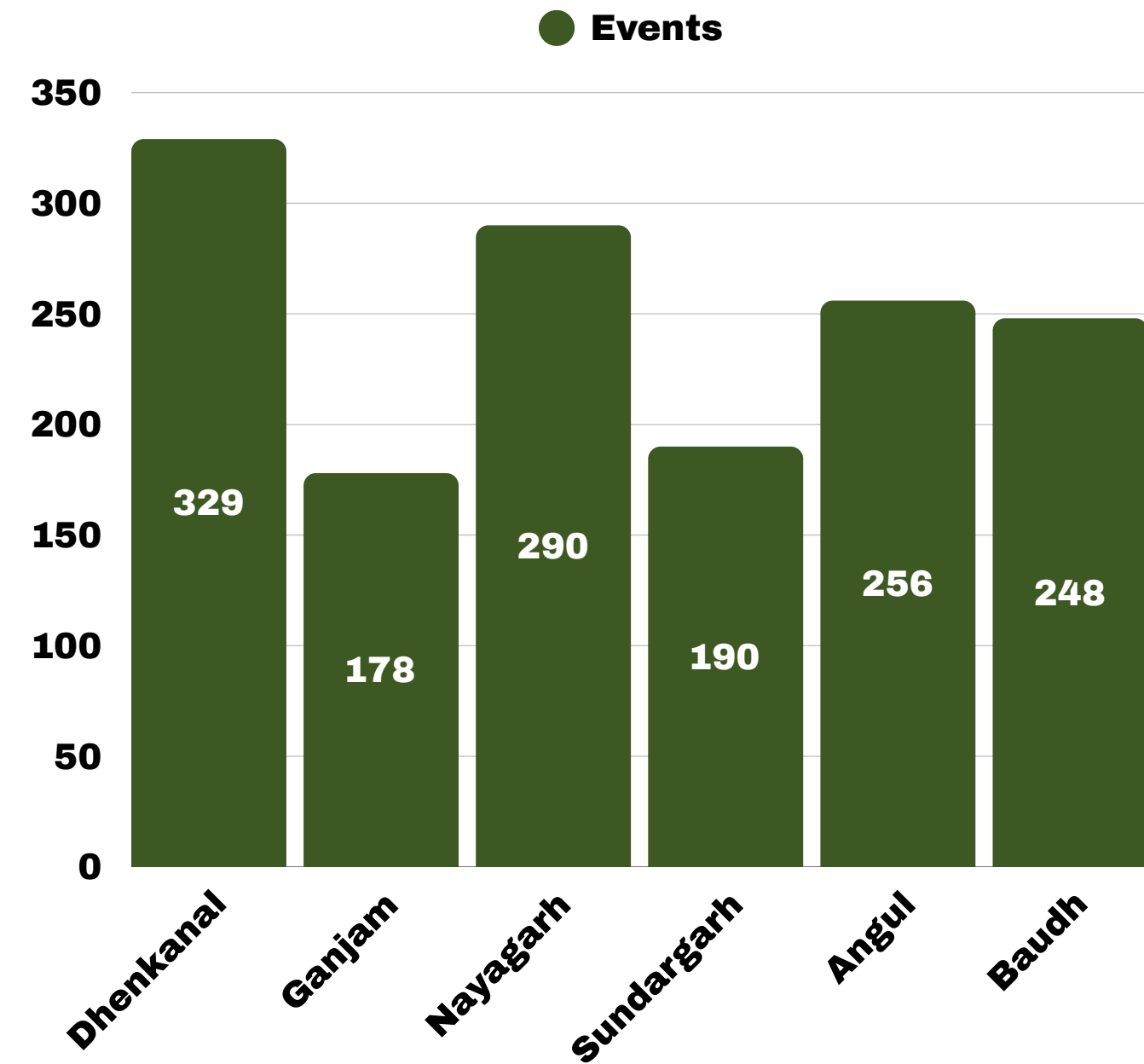
Training & Capacity Building Program

Ratio Male/Female



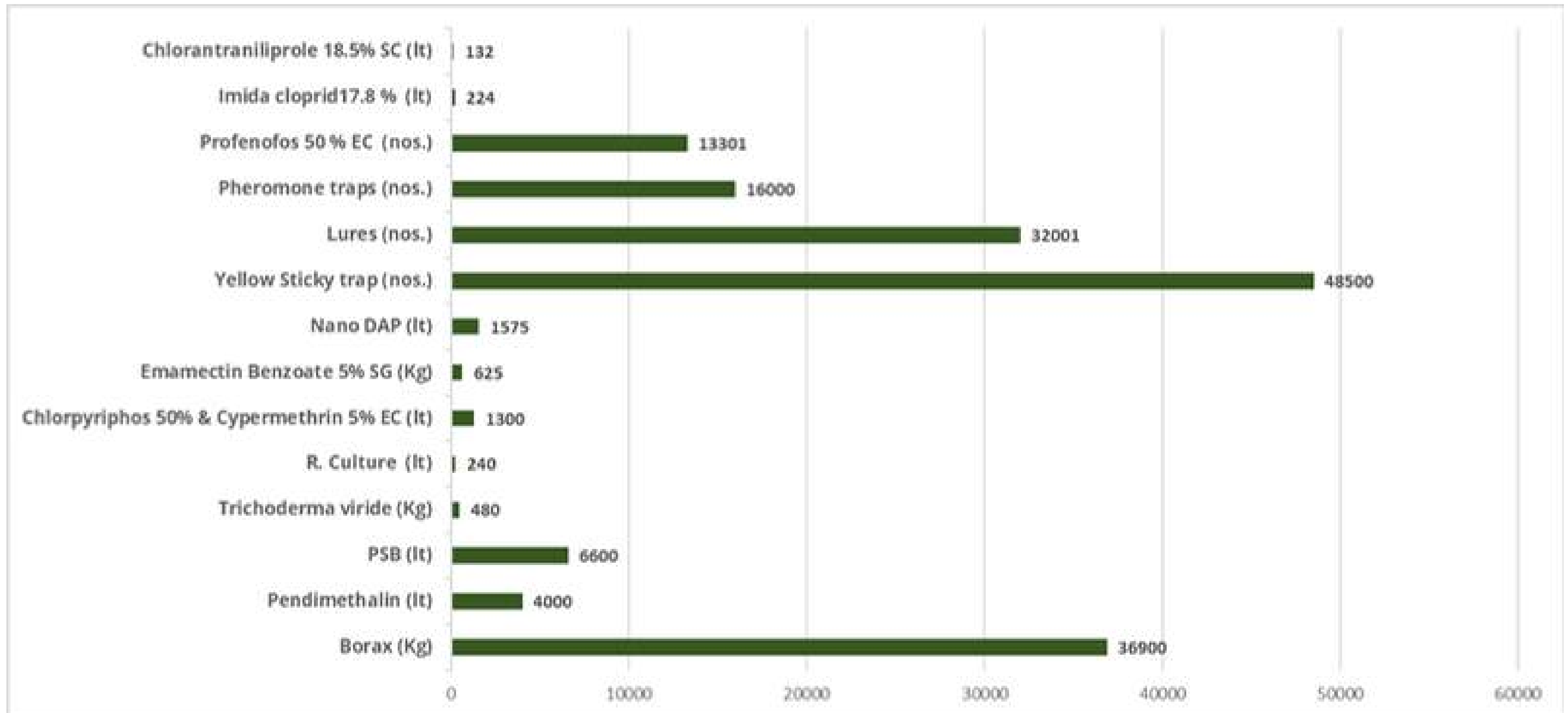
Total no of participants: 5,646

No. of events



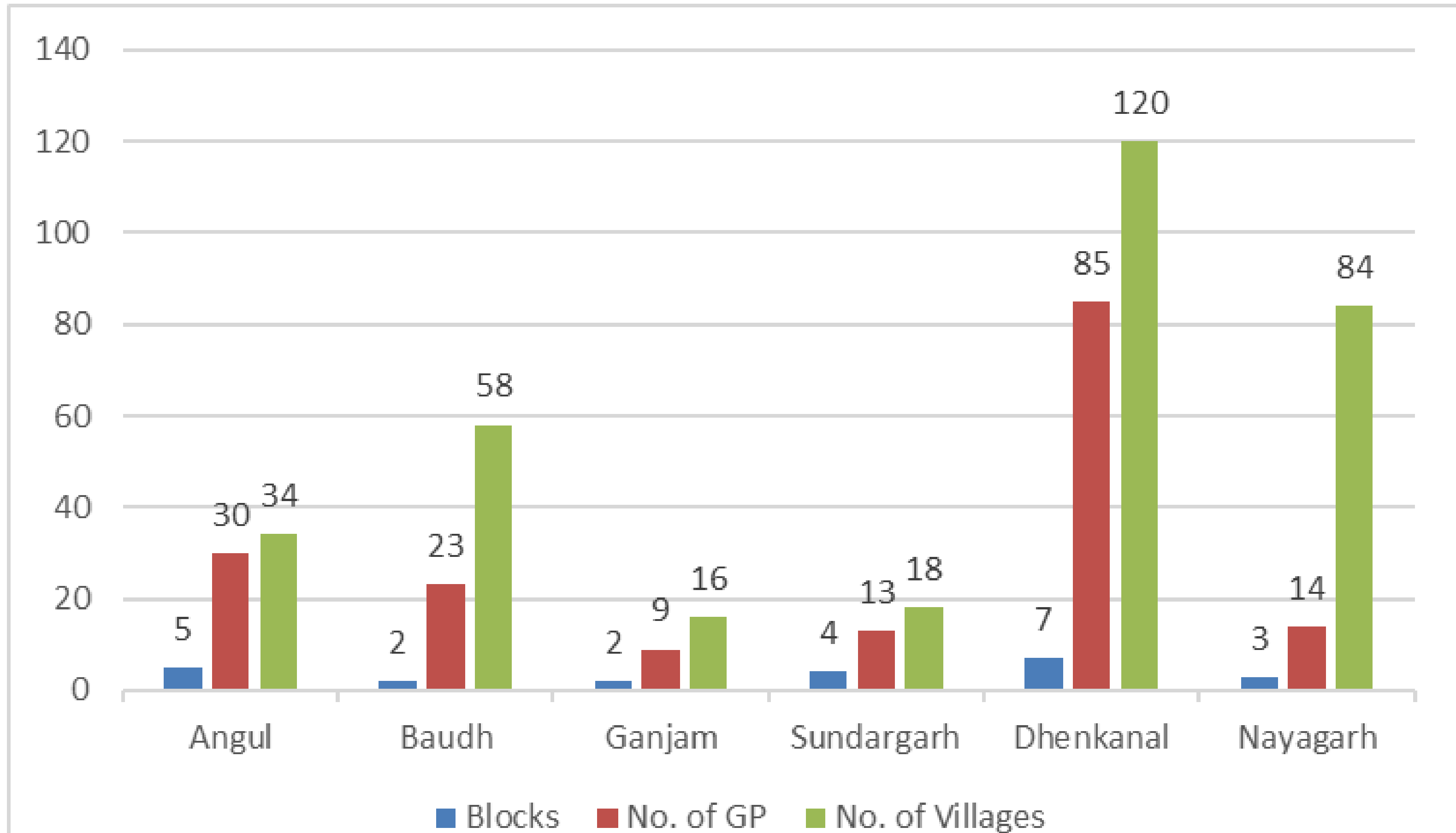
Total Events: 1491

Details of inputs Supplied to all the districts

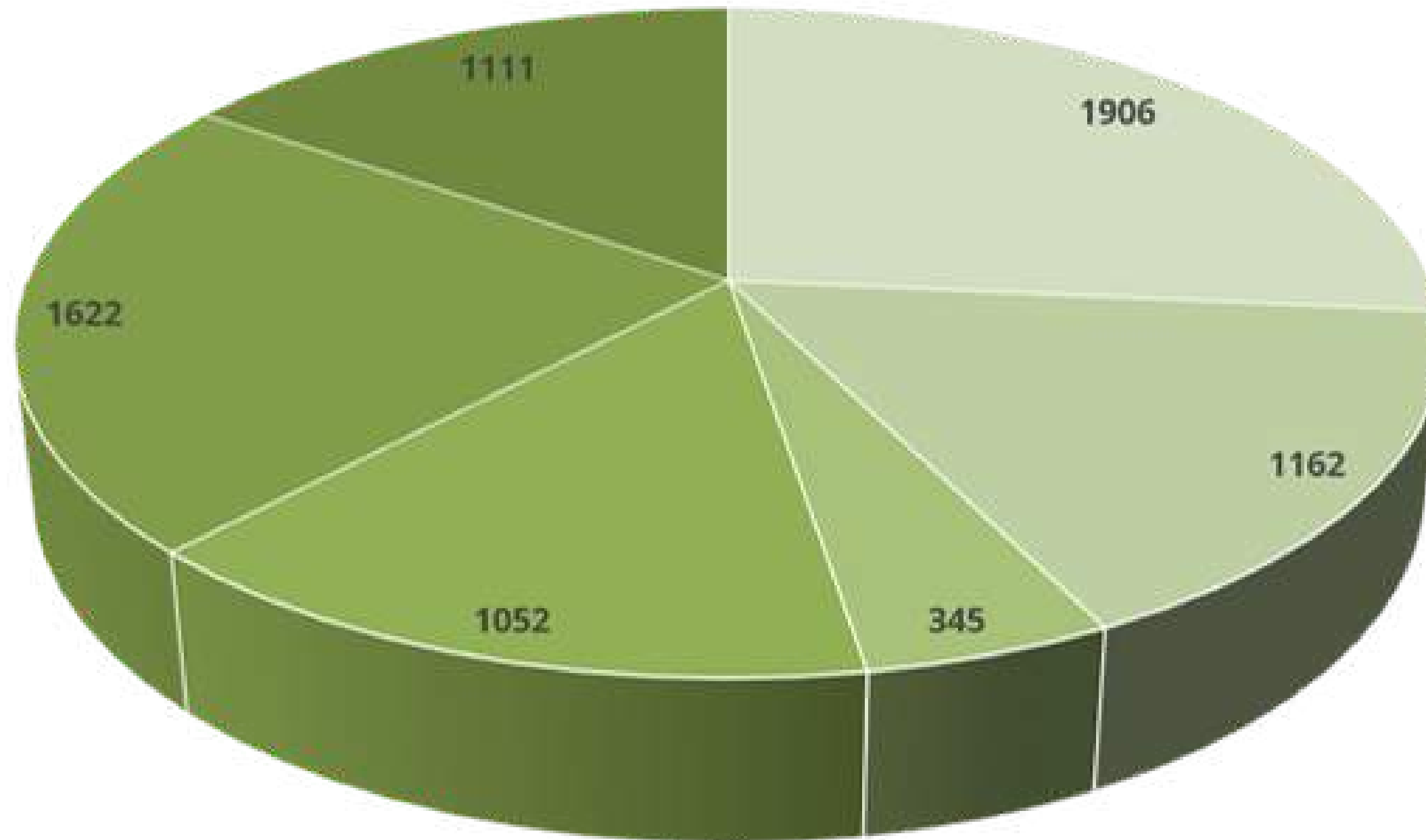


Total no of inputs: 157878

Numbers of blocks, Gp and villages



Numbers of beneficiaries



■ Angul ■ Baudh ■ Ganjam ■ Sundargarh ■ Dhenkanal ■ Nayagarh

Total no of Beneficiaries : 7198



Major interventions

The IAP awareness meetings equipped Odisha's farmers with technical and economic rationale for shifting to arhar and fieldpea cultivation. Through cluster demonstrations, we showcased how these drought-resistant pulses including indigenous varieties like Kandula optimize post-monsoon residual moisture while fixing soil nitrogen.

The sessions contrasted traditional paddy costs with pulse profitability, emphasizing 30% higher margins with lower water needs. Government-backed seed supply chains and planting protocols were detailed to enable immediate adoption. This evidence-based approach turned skepticism into participation, aligning farmer interests with climate-smart policy goals.

Cluster Selection



After the initial awareness campaigns, potential cultivation sites were identified through a participatory process involving PRI representatives, women's self-help groups, and prospective beneficiaries. The selected plots prioritized well-drained soils suited to pigeon pea's drought-resistant traits, deliberately shifting focus from water-intensive paddy to climate-resilient pulses and indigenous legume cultivation.

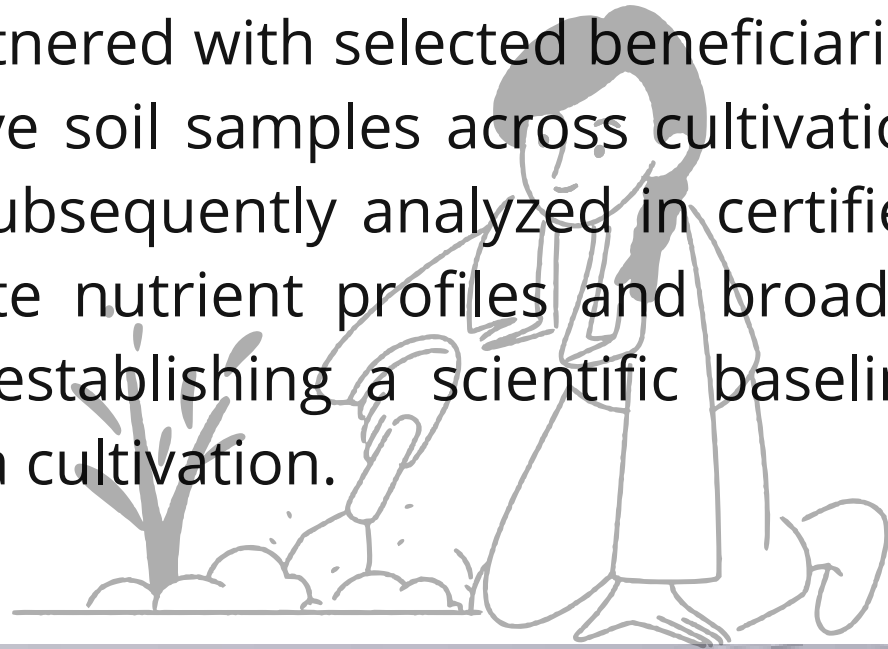


Identification of the Beneficiaries

Village-level consultations, attended by departmental officers and PRI representatives, served as the foundation for both plot identification and beneficiary selection. Formal resolutions were jointly ratified during these meetings, ensuring transparency in designating cultivation participants while aligning with the program's community-driven framework.

Soil sample collection

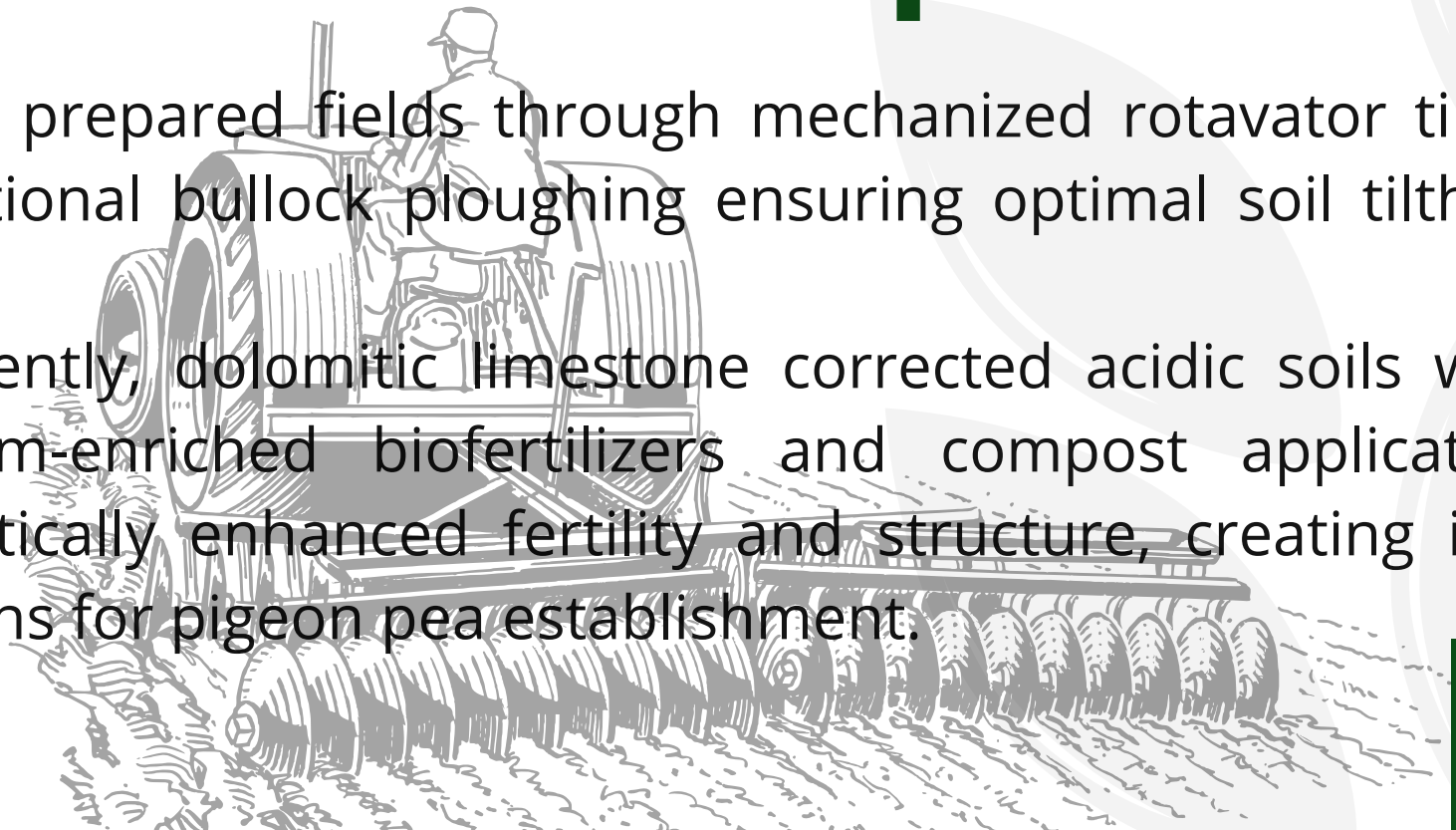
Block coordinators partnered with selected beneficiaries to collect representative soil samples across cultivation clusters, which were subsequently analyzed in certified laboratories to evaluate nutrient profiles and broader soil health indicators establishing a scientific baseline for targeted pigeon pea cultivation.



Soil and Land Preparation:

Farmers prepared fields through mechanized rotavator tillage or traditional bullock ploughing ensuring optimal soil tilth for sowing.

Concurrently, dolomitic limestone corrected acidic soils while rhizobium-enriched biofertilizers and compost applications systematically enhanced fertility and structure, creating ideal conditions for pigeon pea establishment.





Awareness Meetings

The IAP awareness meetings equipped Odisha's farmers with technical and economic rationale for shifting to arhar and fieldpea cultivation. Through cluster demonstrations, we showcased how these drought-resistant pulses including indigenous varieties like Kandula optimize soil nitrogen.

Furthermore, OSVSWA staff provided essential training related to modern agricultural techniques like line sowing as well as Integrated Pest Management with yellow sticky traps and solar traps.

- Consultation on Agriculture
- Provision of Agricultural Inputs
- Marketing of Agricultural Products
- Agricultural Technology Development





Seed and Input Distribution

The program provided high-yielding seeds sourced from OSSC, strategically paired with need-based inputs: organic fertilizers to enhance the nutrient of the soils like PSB and Rhizobium Culture but also precision chemical amendments guided by soil health cards, and biological pest control measures.

This bundled approach combining quality planting material with tailored agroecological supports ensured both immediate productivity gains and long-term sustainability for pigeon pea cultivation.

In total were supplied 61500 kg of seeds to 6 districts.



District and Block Coordination Meeting

A series of strategic coordination meetings under the Chief District Agriculture Officer (CDAO) were convened at the district level to align stakeholders behind the expansion of pigeon pea cultivation. These discussions centered on the scheme's core objectives enhancing farmer livelihoods, optimizing agro-ecological resilience, and integrating market linkages while clarifying roles for block-level agriculture officers, local cooperatives, and panchayat representatives.





Seed Treatment

Farmers employ a precise seed treatment protocol to harness the symbiotic potential of Rhizobium bacteria. Using a standardized rate of 200 mL per hectare, they uniformly coat pigeon pea seeds with liquid inoculant.

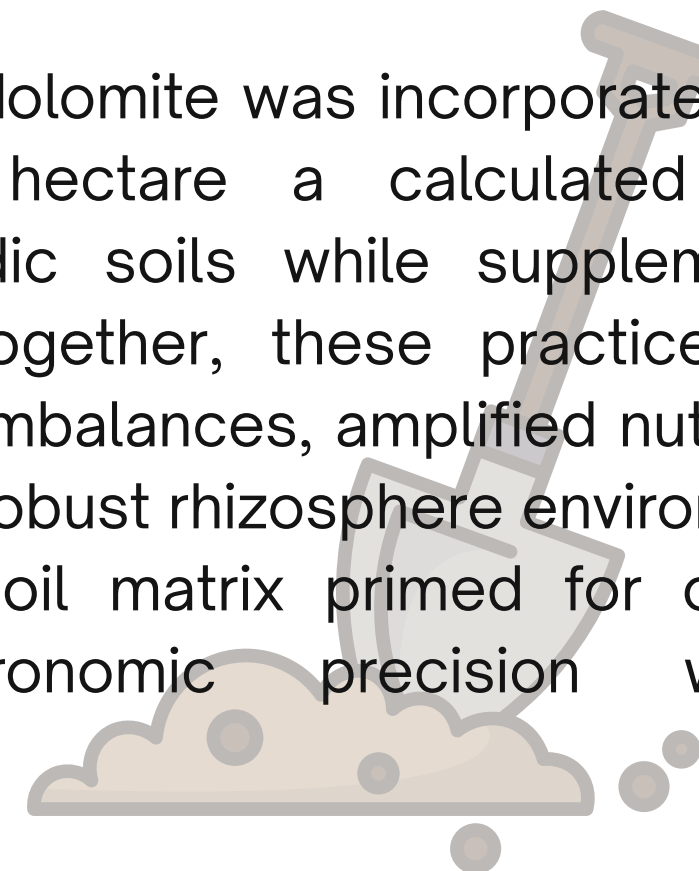
This science-backed practice establishes a critical biological partnership: the Rhizobium-legume symbiosis converts atmospheric nitrogen into plant-available forms, naturally enhancing soil fertility. By integrating this technique with proper sowing methods, farmers elevate both crop vigor and yield potential while reducing synthetic input dependency.



Soil Treatment

Farmers implemented a multi-layered soil enhancement protocol during final tillage, combining biological and mineral amendments for systemic improvement. A carefully measured application of Phosphate-Solubilizing Bacteria (PSB) and *Trichoderma viride* cultures was integrated into the soil, activating microbial communities to unlock nutrients and suppress pathogens. This was augmented with mature compost, enriching organic matter to sustain soil biology.

Concurrently, dolomite was incorporated at a rate of 2.5 quintals per hectare a calculated intervention to neutralize acidic soils while supplementing essential magnesium. Together, these practices synergistically corrected pH imbalances, amplified nutrient cycling, and established a robust rhizosphere environment. The result: a revitalized soil matrix primed for crop productivity, blending agronomic precision with ecological stewardship.





Seed Sowing

To maximize seed purity and agronomic efficiency, pigeon pea cultivation was implemented in line-sowing systems fostering the shift from traditional broadcasting methods. This structured approach, showcased in demonstration plots, optimized plant spacing for enhanced light penetration, root development, and mechanized management.

Field Days And WSHGs

The culmination of the cropping cycle transformed into a participatory learning platform, where field days showcased pigeon pea's yield potential under improved agronomic practices. Farmers and neighboring communities observed firsthand the impact of technology adoption from optimized spacing to biofertilizer use.



Critically, Women's Self-Help Groups (WSHGs) anchored this knowledge transfer, their involvement spanning the entire value chain: from training sessions on seed treatment to post-harvest management. This dual engagement ensured the scheme's techniques resonated beyond participant circles, embedding innovation into local farming culture



Crop Cutting and Harvest:

The yield assessment protocol employed scientific rigor, with crop-cutting exercises conducted in standardized 5m×5m clusters to extrapolate dry-weight metrics per hectare—a method that balanced accuracy with farmer accessibility. Postharvest, producers received targeted guidance: sun-drying harvests for 2–3 days to preserve seed viability for future planting cycles, while strategically timing market sales to capitalize on peak demand pulses and oilseeds command.



Data Digitization and Yield Analysis:

The Intensive Agriculture Programme leveraged digitized governance through the ADAPT portal, ensuring precision in beneficiary verification (via KO registry) and real-time monitoring of pigeon pea coverage. Departmental teams conducted geo-tagged plot verifications, while systematic crop-cutting data (5m×5m clusters) was digitized to validate yield gains demonstrating a 15–20% increase over traditional practices.



Data-Digitization

Geo-Tagging

Beneficiary & Benefit Tagging

Crop Coverage

Project Outcomes



Environmental Impact



Social Impact



Economical Impact:



Environmental Impact

Sustainable Agriculture

The programme promotes eco-conscious farming by replacing synthetic inputs with bio-fertilizers and bio-pesticides. Integrated Pest Management (IPM) tools, such as light traps and pheromone traps, curb pest populations without disrupting ecological balance.

Soil Health Improvement

Pulse-inclusive crop rotations further regenerate soils by improving structure, water retention, and microbial activity, creating a resilient foundation for long-term productivity.

Water Conservation

Pigeon pea's low water requirement and adaptability to residual moisture make it a cornerstone of the programme. By minimizing irrigation dependence and optimizing soil moisture use, the crop addresses critical water scarcity.

Regenerative Agriculture

The integration of organic inputs, IPM, and legume-based systems exemplifies regenerative principles: rebuilding soil organic matter, sequestering carbon, and reducing agrochemical dependency.



Social Impact



Improved Livelihoods

By upscaling pigeon pea cultivation in underutilized lands, the programme directly boosted incomes for small and marginal farmers. The establishment of Community-Managed Seed Systems (CMSS) further empowered farmers, enabling local seed sovereignty and creating new revenue streams through certified seed production.



Nutritional Security

By upscaling pigeon pea cultivation in underutilized lands, the programme directly boosted incomes for small and marginal farmers. The establishment of Community-Managed Seed Systems (CMSS) further empowered farmers, enabling local seed sovereignty and creating new revenue streams through certified seed production.



Community Empowerment

The programme anchored its outreach through Farmer Producer Organizations (FPOs) and Women's Self-Help Groups (WSHGs). These collectives transformed women into agri-entrepreneurs: pooling resources, accessing premium markets, and negotiating fair prices. Beyond economics, they became hubs for peer learning and social resilience, dismantling gender barriers in agriculture.



Awareness & Capacity Building

Targeted training on pigeon pea's climate-smart practices and postharvest management equipped farmers to maximize yields and minimize losses. Interactive campaigns, led by local champions, disseminated knowledge through farmer field schools, bridging the gap between research and field-level adoption.

Economical Impact

1 Productivity & Income Growth

With implementation across 4 lakh hectares, farmers achieve 20-35% higher yields compared to traditional Kharif crops, capitalizing on pigeon pea's drought tolerance and shorter growing cycle.

2 Cost Optimization

Pigeon pea's drought resilience slashes irrigation costs by 40-60% compared to paddy, while bio-fertilizers and soil amendments reduce dependency on synthetic inputs. Over 3-5 years, these practices cut production costs by 25%.



3 Market Security

The programme institutionalizes MSP-backed procurement and forges direct linkages with pulse processors and Farmer Producer Organizations (FPOs), guaranteeing fair prices and minimizing trader exploitation.

4 Employment Multipliers

From seed treatment to harvest, pigeon pea's labor-intensive value chain generates 120-150 person-days/acre. Women's SHGs dominate postharvest activities, capturing 40% of new jobs and redistributing income within rural households.



Success Stories



Young Leadership in Agriculture

At 23, Priyadarshini Bhol leads 1,008 women farmers as CEO of Baldevjew Women Farmers Producer Company, overseeing cultivation across 125 acres. With OSVSWA's ongoing support, she expanded her pigeon pea cultivation from 1.5 acres last year to 2.5 acres this season.

Committed to continuous learning, she mastered pest management and soil preparation techniques through training programs. Her expertise quickly made her a trusted resource in the village, with fellow farmers seeking her advice on sustainable practices.

Looking ahead, Priyadarshini aims to establish a shared processing facility and strengthen market connections. Her rapid rise from local graduate to agricultural leader highlights how young innovators can become drive rural transformation.

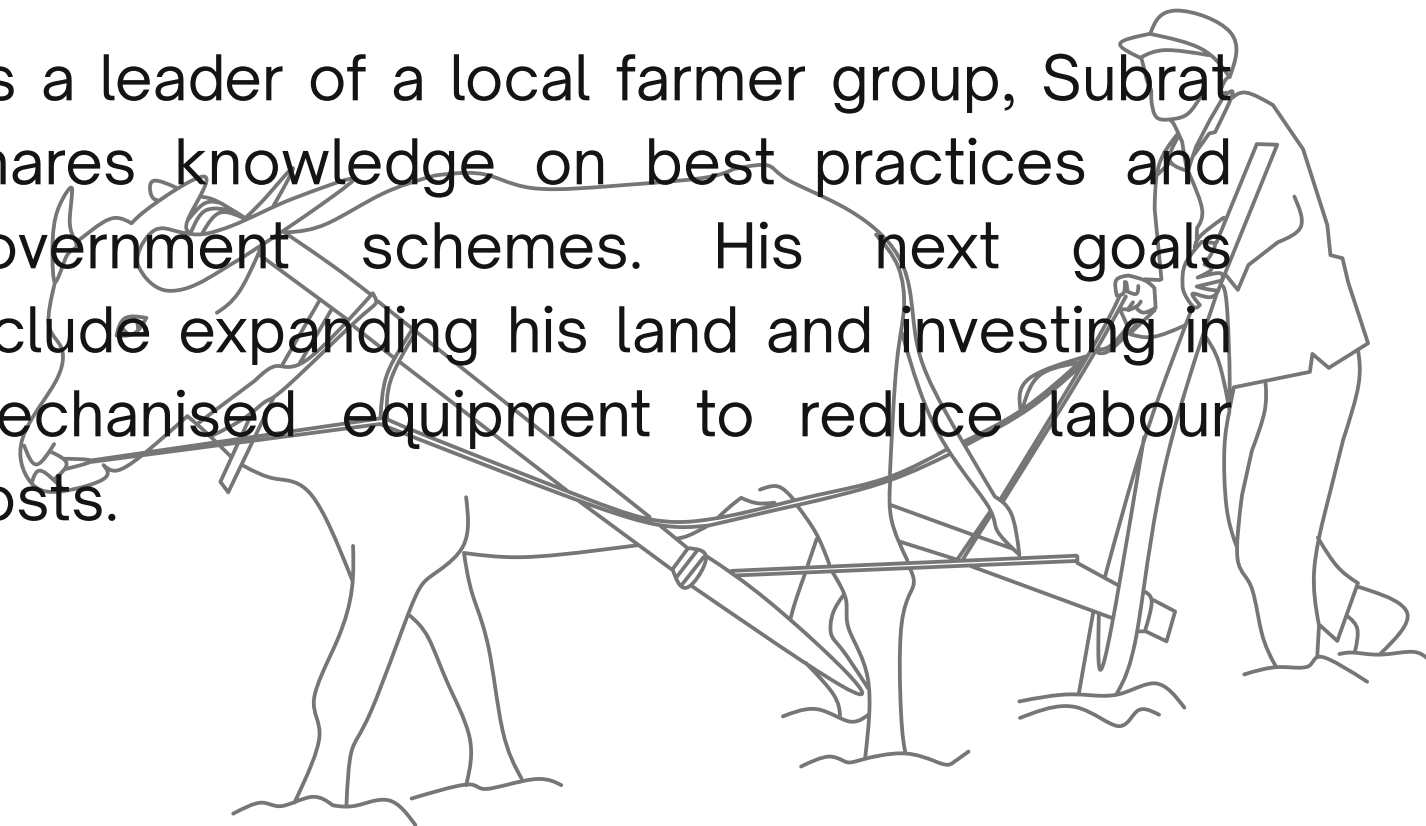
Priyadarshini Bhol

CEO of Baldevjew Women Farmers
Producer Company Ltd since 2023

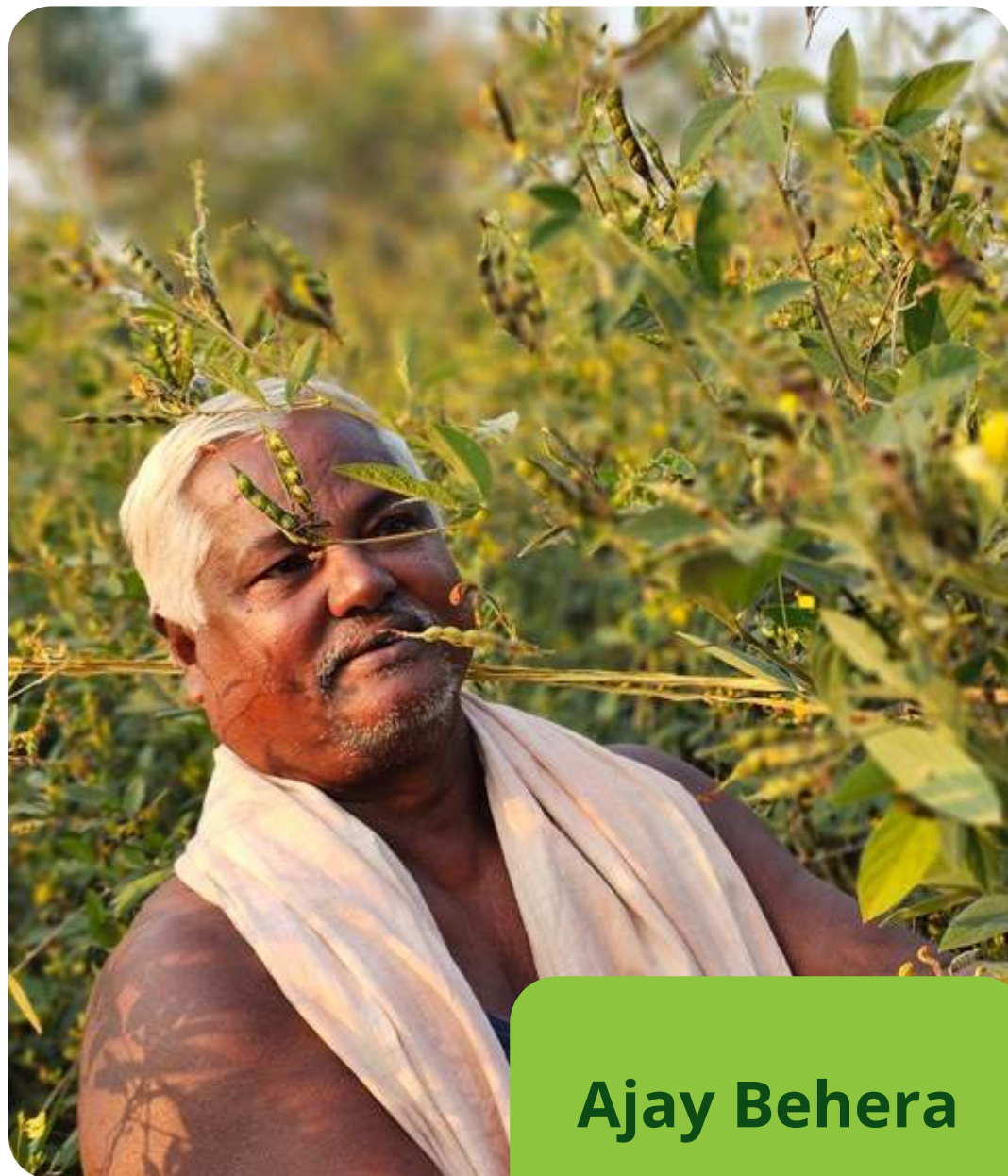
Young Leadership in Agriculture

Subrat, a 28-year-old graduate, combined traditional farming with modern techniques on his rented 8-acre land. Since the participation to the IAP program, he doubled his income from ₹30,000–40,000 to ₹60,000–70,000, thanks to OSVSWA guidance and support.

As a leader of a local farmer group, Subrat shares knowledge on best practices and government schemes. His next goals include expanding his land and investing in mechanised equipment to reduce labour costs.



Subrat Kumar



Ajay Behera

Ajay, a 60-year-old farmer from Kalikaprasad, struggled with irrigation and wildlife interference. By adopting line sowing, seed treatment, and integrated pest management, he boosted his pigeonpeas profits from 70 thousand rupees to 1,3 lakh. With OSVSWA staff support, he improved his techniques doubling his profits from pigeonpeas alone. Looking ahead, he hopes for better irrigation infrastructure and wildlife protection measures to further enhance productivity.

Farmers Feedback

Bikas, a 45-year-old farmer from Mahulapunji, manages a 12-acre farm with mangoes, paddy, pigeon peas, and cashews. With OSVSWA support, he adopted modern farming techniques such as line sowing and soil treatment increasing his yield and earning ₹2.5 lakh in profit from a ₹1.5 lakh investment. Active in his SHG, he influences over 60% of farmers in his area. Future plans include expanding pigeon pea cultivation and securing warehouse support for equipment storage.



Bikas Sahoo

Women Self Help Groups Towards Nutritional Diets and Economic Independence



Eight women's self-help groups (SHGs) with a total 90 members in Bhuban Block have redefined resilience through collective farming.

With OSVSWA assistance, they diversified into nutrient-rich enterprises, revitalizing fallow land into thriving plots. Their pivot to pigeon pea cultivation proved transformative: the crop's high protein content and soil-enriching properties not only improved household nutrition but also secured a steady income stream. Last year, sales through their FPO generated ₹50,000 per member, underscoring the dual benefit of food security and economic stability.

OSVSWA played a pivotal role in this shift, providing training on sustainable pigeon pea farming and linking the SHGs to markets. Beyond the fields, the groups actively mobilize their villages, showing how organized women farmers, backed by institutional partnerships, can turn challenges into opportunities.



Rabi Narayan Sandha

Income Growth and Innovation

Rabi Narayan Sendha, a 61-year-old farmer from Jankhira village in Dhenkanal district, is participating in the IAP Project for the third year. Thanks to OSVSWA's continuous support, he was able to increase his income from ₹1.2 lakh to ₹2.7 lakh, enabling him to purchase essential machinery, such as a borewell for irrigation, and hire four workers for his fields.

The assistance provided by the staff guided him in adopting modern farming practices, including line sowing and biofertilizers for crop cultivation. Additionally, selling his agricultural produce in the market has boosted his family's income, creating opportunities to expand his business by renting more land and investing in future agricultural activities. His success has set an example in the village, encouraging other farmers to join the IAP program and fostering cooperation through the formation of a 23-member Producer Group.



Leadership in Agriculture

Chitan Bruh, native of Asanbeda village, Nuagaon GP combined traditional farming with Integrated pest management in his 2acre land for arhar cultivation and got more profit due to less expenditures for controlling insect and pest in cultivation practice. He earned 20,000 to 25,000 which gave a very good support for his financial strength with the helping hand of OSVSWA.

As an experienced farmer, farmers of his locality showing interest towards his knowledge about these best practices and government schemes. In upcoming years he is aiming for expanding his area under arhar cultivation



**Chaitan
Bruh**

Women leadership In Agriculture

Lallo Sahoo, W/o Somra saho, resident of village Joketa, GP Nuagaon cultivated red gram in her 2.5 acre land by the support and help of OSVSWA team in Nuagaon block.

She doubled her income by using inputs from IAP scheme of Govt. of Odisha 20,000-25,000 to 33,000-38,000. She became an example for other women farmers as applying the modern techniques in cultivation practices. Her expertise made her a trusted resource in the village, with fellow farmers seeking her advice on sustainable practices.

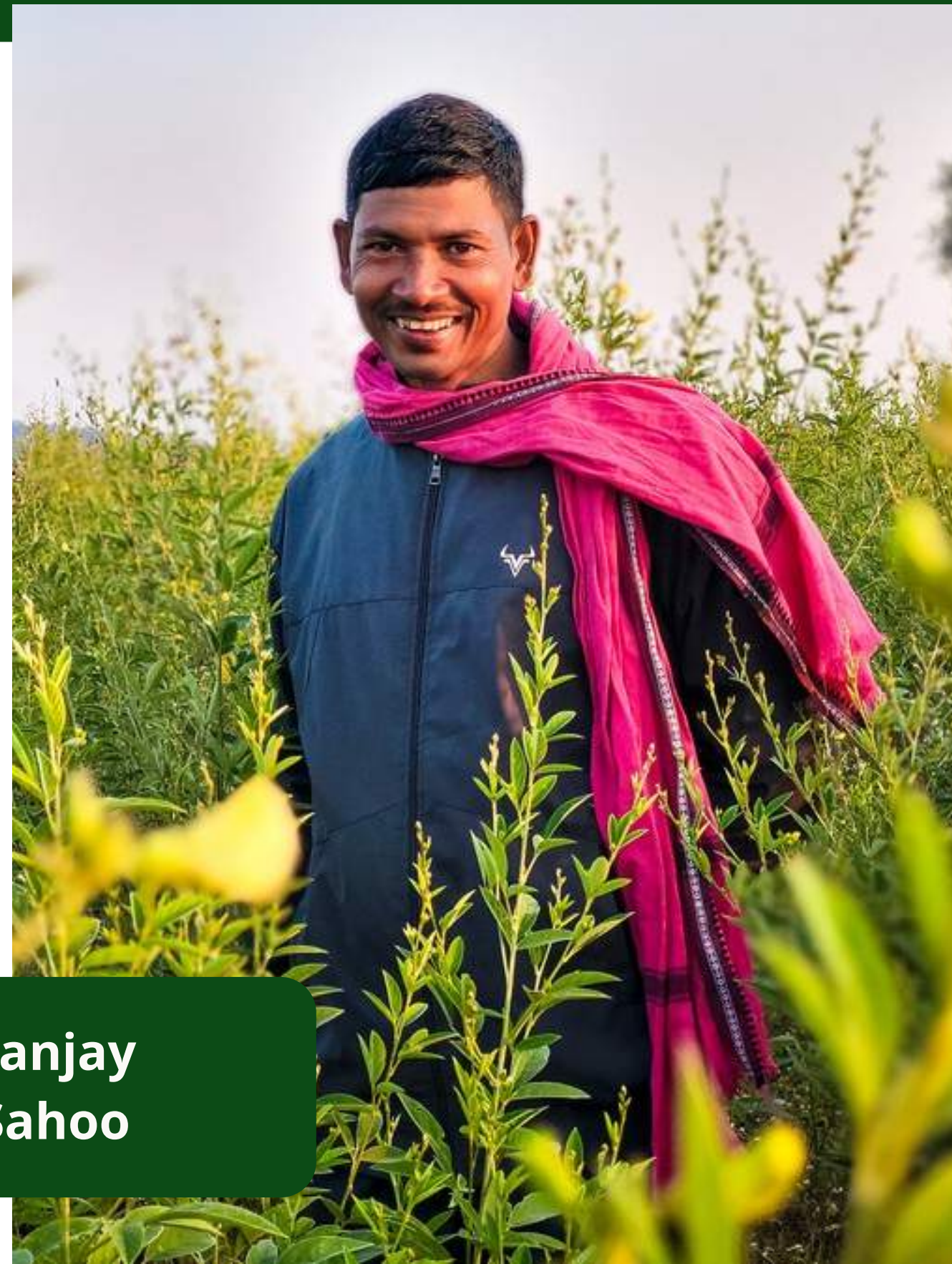


Lallo
Sahoo

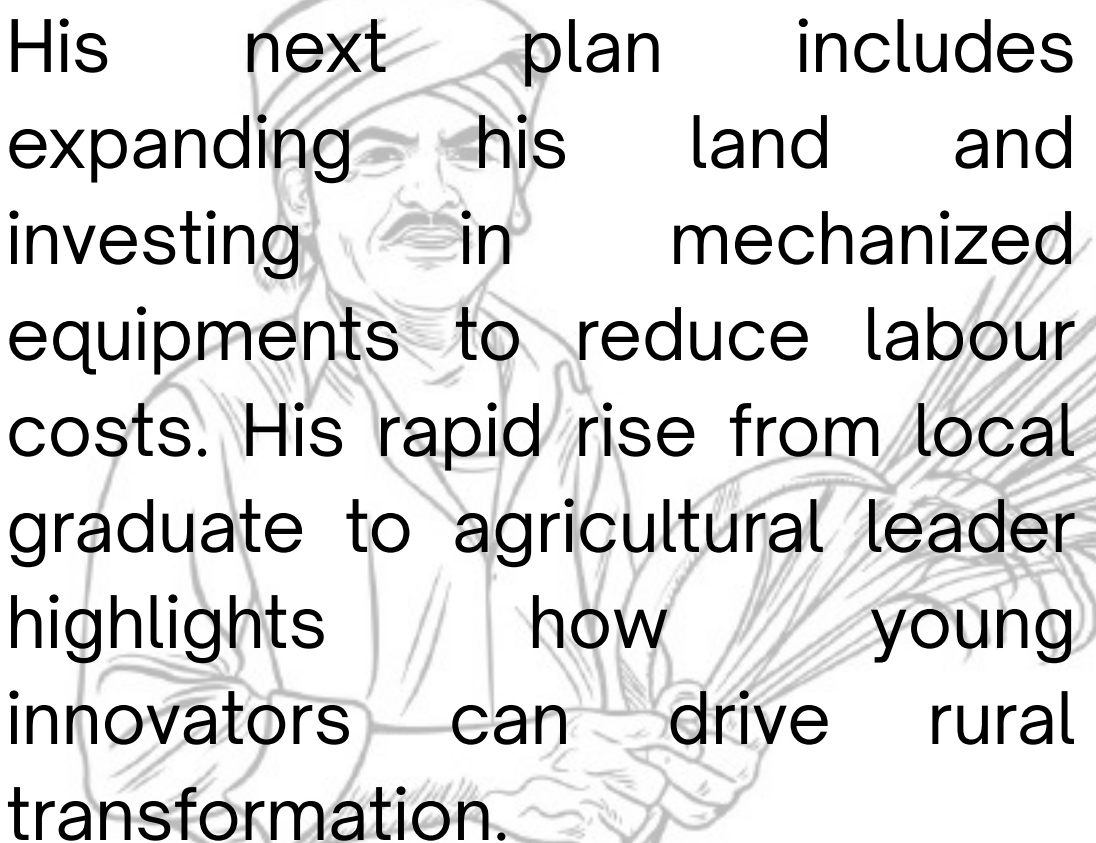


Young influencer In Agriculture

25- years old graduate, named Sanjay sahuo cultivated red gram in his rented 2.5acres of land in Joketa village in Nuagaon block. By the help of OSVSWA team he involved in IAP scheme and as a result of which he increased his income to 35,000-40,000 in a single season.



**Sanjay
Sahoo**



His next plan includes expanding his land and investing in mechanized equipments to reduce labour costs. His rapid rise from local graduate to agricultural leader highlights how young innovators can drive rural transformation.

Aknowledgments

OSVSWA sincerely thanks all partner organizations whose consistent collaboration was vital to the success of the Intensive Agriculture Programme on Forgotten Crops 2024-25 in Odisha.

We extend our deep gratitude to the Directorate of Agriculture and Food Production, Odisha, and the Department of Agriculture & Farmers' Empowerment for their crucial financial and logistical support at the state level. Their proactive engagement ensured seamless project implementation.

At the grassroots level, District Agriculture Officers, Block Agriculture Offices, and field staff displayed exceptional dedication in bringing project initiatives to fruition, directly benefiting farming communities.

A special acknowledgment goes to the Odisha State Seed Corporation Ltd. (OSSC) and the National Seed Corporation (NSC) for their indispensable role in seed supply and procurement. Additionally, the Odisha Agro Industries Corporation (OAIC) and the Odisha State Cooperative Marketing Federation (OSCMF) provided critical agricultural inputs and soil management solutions, elevating farming efficiency.

We also recognize Fine Trap and the Odisha Consumer Cooperative Federation (OCCF) for their expertise in integrated pest management, which played a key role in safeguarding crop health and ensuring sustainable yields.



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