



BASELINE STUDY ON GREEN COLLEGE ODISHA: “CREATING GREEN VALUE WEBS FOR TRIBAL WOMEN FARMERS”



FINAL REPORT
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List of Abbreviation

ABBREVIATION	FULL FORM
AE	Agri-Entrepreneur
AEPS	Agri-Entrepreneur Promotion Scheme
APICOL	Agricultural Promotion & Investment Corporation of Odisha Ltd.
APC	Agriculture Production Cluster
ATMA	Agricultural Technology Management Agency
BDO	Block Development Officer
BLCC	Block Level Coordination Committee
BOD	Board of Directors (of PC)
BRLF	Bharat Rural Livelihoods Foundation
BRC	Bio-Resource Centre
BYP	Backyard Poultry
CAPI	Computer-Assisted Personal Interviewing
CRLP	Community River Lift Project
CSO	Civil Society Organization
DLCC	District Level Coordination Committee
DMF	District Mineral Foundation
DOAFE	Department of Agriculture & Farmers' Empowerment (Odisha)
DOH	Directorate of Horticulture (Odisha)
E-NAM	Electronic National Agriculture Market
FGD	Focus Group Discussion
HVC	High-Value Crops
IBCB	Institution Building & Capacity Building
ITDA	Integrated Tribal Development Agency
KII	Key Informant Interview
MIDH	Mission for Integrated Development of Horticulture
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MIS	Management Information System
MRLP	Micro River Lift Project
MSP	Minimum Support Price
NHM	National Horticulture Mission
NPM	Non-Pesticide Management
NTFP	Non-Timber Forest Produce
OAIC	Odisha Agro Industries Corporation
OLIC	Odisha Lift Irrigation Corporation
OLM	Odisha Livelihoods Mission
PC	Producer Company
PG	Producer Group
PHM	Post-Harvest Management
PMKSY	Pradhan Mantri Krishi Sinchayee Yojana
POP	Package of Practices
PRADAN	Professional Assistance for Development Action
RKVY	Rashtriya Krishi Vikas Yojana
SLCC	State Level Coordination Committee
STSC DEPT.	Scheduled Tribe & Scheduled Caste Development Department (Odisha)
TNA	Training Needs Assessment
WC	Working Capital

EXECUTIVE SUMMARY

The Green College Baseline Study was conducted across 11 districts and 15 blocks of Odisha to assess capacities, livelihood systems, and training needs of farmers, agro-ecopreneurs, Producer Groups (PGs), Producer Companies (PCs), frontline functionaries, and CSO partners under the APC 2.0 programme. The study establishes a robust baseline for tracking midline and endline changes. A mixed-methods approach was adopted, combining household surveys of **365 farmers (276 PG Member and 89 Control farmer), 133 Key Informant Interviews (KIs) of institutional assessments** and **15 Focus Group Discussions (FGDs) of PG Members**.

APC clusters are largely tribal-dominated, smallholder, and rainfed, with heavy dependence on paddy cultivation and limited crop diversification. Livelihood vulnerability remains high due to climate risks, weak irrigation, and market constraints. However, APC households show early positive effects of programme engagement, including higher income levels, greater livelihood diversification, stronger institutional participation, and better exposure to training compared to control households.

The study applied the P-K-S-A-C framework (Perception, Knowledge, Skill, Attitude, and Capability to Act) to systematically assess behavioural and technical readiness. A stratified multi-stage sampling design ensured representation across agro-ecological zones and tribal clusters. Quantitative analysis was complemented by qualitative tools to capture contextual dynamics. Propensity Score Matching (PSM) was used to improve comparability between APC and control households, strengthening attribution. Data quality was ensured through standardized field protocols, CAPI-based surveys, supervision, and back-checks.

Key Findings

1. Socio-economic and Livelihood Profile

APC households show greater dependence on agriculture (93.5%) than control households (88.8%) and higher asset diversification. Average annual income among PG members (₹69,400) exceeds that of control farmers (₹57,600), supported by vegetables, livestock, and allied activities. Despite these gains, rainfed dependence and climate shocks continue to constrain livelihood stability.

2. Land, Water, and Production Systems

PG members operate slightly larger landholdings (2.6 acres vs. 2.1 acres) and have marginally better irrigation access. Paddy dominates cropping systems (about 90% of households). Emerging vegetable and high-value crop clusters indicate diversification potential, but productivity remains constrained by water scarcity, limited irrigation technologies, and low soil testing adoption.

3. Training Exposure and Adoption of Practices

Adoption of improved practices is higher among PG members. Reduced chemical input use was reported by 62–68% of PG members compared to 38–41% of controls. Crop rotation adoption

stands at 54% among PG members versus 29% among controls, while organic input use is reported by 57% and 34%, respectively. Adoption remains low for mechanization, climate-smart practices, nursery management, and micro-irrigation. Regression analysis indicates land ownership as the strongest predictor of adoption (OR >2.0; $p < 0.01$). Training exposure shows a positive but modest effect, highlighting the need for deeper and sustained capacity building.

4. Livestock and Allied Sectors

Livestock engagement is significantly higher among APC households (42.96%) than controls (24.72%). Income from livestock is reported by 35.02% of APC households compared to 15.73% of controls. Livestock plays a critical role in income diversification and resilience, but requires strengthened capacities in scientific rearing, animal health, fodder management, and enterprise skills.

5. Market Access and Enterprise Readiness

FGD findings indicate that improvements in producer bargaining power are driven by a combination of factors rather than market access alone. Collective aggregation through Producer Groups and Producer Companies enhances negotiation capacity where institutions are functional, though performance varies across blocks. Access to market information, basic enterprise and financial management skills, and reduced transaction costs also significantly influence producers' ability to negotiate prices. Agro-ecopreneurs demonstrate strong interest in market engagement, but gaps in business planning and record-keeping constrain effective participation.

6. Institutional Capacities of PGs, PCs, CSOs, and Frontline Workers

PGs show effective mobilization but weak financial management. PCs have made progress in governance but require stronger business planning and market integration. CSOs play a central facilitation role but face staffing and monitoring constraints. Frontline functionaries require enhanced capacities in technical advisory services, documentation, and digital tools. These gaps directly affect the effectiveness of Green College interventions.

Training Needs Assessment

The Training Needs Assessment (TNA) across farmers, agro-ecopreneurs, PG/PC members, CSOs, government departments, and frontline workers reveals the following priority domain:

- **Sustainable agriculture:** SRI/SRP, organic/NPM farming, crop rotation, protected cultivation, on-farm demonstration plots, farmer field schools, season-long handholding, peer learning.
- **Soil health:** Soil testing literacy, micronutrient management, composting, green manuring, soil health card interpretation, nutrient planning, bio-input preparation, practical application at field level.
- **Water management:** Micro-irrigation, rainwater harvesting, moisture conservation, crop-water budgeting, climate resilience, efficient water-use practices, scheme convergence.
- **Livestock management:** Scientific rearing, vaccination, fodder systems, enterprise development, animal health management, productivity enhancement, income diversification, risk buffering.

- **Market linkage & enterprise development:** Collective aggregation, pricing, buyer coordination, record keeping, price discovery, marketing channels, deferred storage, readiness of market, post-harvest management, grading, quality maintenance, negotiation capacity.
- **Digital literacy:** Smartphone use, advisory apps, MIS reporting, directly related to understanding quality & parity, quality parity dynamics, market information access, price comparison, digital enablement integrated with production and marketing practices.

These needs emphasize the importance of **hands-on, field-based, vernacular training models**, supported by demonstrations, peer learning, and structured follow-up mechanisms.

Training Needs

The baseline study of the Green College Odisha identifies key capacity gaps across stakeholders affecting farm practices, enterprise readiness, and market connectivity. To strengthen skills and improve overall programme outcomes, the following stakeholder-specific training needs are recommended.

1. Farmers

- Practical skills in **sustainable agriculture**, including SRI/SRP, soil health management, water-use efficiency, and organic/NPM practices.
- Training on **livestock care**, improved feeding, disease prevention, and integrated farming systems.
- Need for **market linkage skills**, basic record keeping, and awareness of government schemes.

2. Agro-Ecopreneurs

- Capacity building in **business planning**, costing, pricing, and profit management.
- Skills in **value addition**, packaging, processing, and quality standards for selected trades.
- Improved **market intelligence**, digital marketing, and buyer linkage capabilities.

3. Producer Group (PG) Members

- Strengthening **group governance**, meeting practices, and financial literacy.
- Skills in **collective input procurement**, aggregation, and basic marketing operations.
- Awareness of **government schemes**, documentation processes, and linkage facilitation.

4. Producer Company (PC) Staff/Board

- **Business management and enterprise development**, including procurement systems and supply chain planning.
- Training in **MIS, record keeping, compliance**, and financial accounting.
- Skills to develop **market tie-ups**, negotiate with buyers, and manage collective marketing.

5. Frontline Functionaries (CRPs, Krushi/Prani/Udyog Mitras)

- Strengthening **technical knowledge** on agriculture, livestock, NPM, and water management advisory.

- Skills in **communication, mobilization, and facilitation** to improve last-mile extension.
- Capacity in **digital data reporting**, field documentation, and monitoring tools.

1 INTRODUCTION

1.1 Project Context and Background

Agriculture continues to be the backbone of rural India, employing about **44 per cent of the national workforce**, with a majority of cultivators belonging to the **small and marginal farmer category** (Periodic Labour Force Survey, Ministry of Statistics and Programme Implementation, Government of India; Agricultural Census, Ministry of Agriculture & Farmers Welfare). Despite its central role, the sector faces persistent challenges including low productivity, increasing climate variability, weak market integration, limited value addition, and inadequate skill and enterprise ecosystems, which constrain the transition towards diversified and resilient livelihood systems (NITI Aayog; FAO India Country Programming Framework).

In Odisha, nearly 65 per cent of the population is dependent on agriculture, with the sector largely rainfed, accounting for approximately 62 per cent of the net sown area (Directorate of Economics & Statistics, Government of Odisha). Landholdings are highly fragmented, with an average operational holding of around 2.7 acres (Agricultural Census, GoI), and levels of functional literacy remain relatively low at 72.9 per cent (Census of India, Office of the Registrar General & Census Commissioner). These structural characteristics directly affect farmers' ability to adopt improved technologies, engage in agri-enterprises, and respond effectively to climate and market risks. Additionally, declining youth participation in agriculture, as highlighted by PLFS and NITI Aayog, reflects gaps in vocational skills, limited exposure to modern technologies, and weak linkages with markets and enterprise opportunities. Collectively, these conditions underscore the need for a structured skilling, enterprise development, and institutional strengthening ecosystem tailored to Odisha's agrarian context.

The Agriculture Production Cluster (APC) programme, jointly implemented by BRLF and the Government of Odisha since 2018, demonstrated the effectiveness of a cluster-based development approach. APC Phase 1.0 established a strong grassroots institutional base through Producer Groups, Producer Companies, Community Resource Persons, and promotion of agroecological practices. The APC Completion Report documents improvements in collective action, adoption of improved practices, and early livelihood diversification.

At the same time, the completion assessment highlights persistent second-generation gaps, including uneven technical depth, limited enterprise readiness, weak value-chain integration, and variable institutional capacities across clusters. These findings underscore a key lesson from APC 1.0: while institutional platforms are necessary, sustained impact requires a structured, continuous, and practice-oriented skilling and knowledge system to translate institutions into scalable and resilient livelihood outcomes.

Building on these lessons, APC 2.0 (2024–2028) positions the Green College initiative as the core skilling and knowledge ecosystem of the programme. The Green College is envisaged as a state-level platform to address persistent capacity gaps by providing structured, practice-oriented training, technical backstopping, and institutional strengthening support across APC geographies.

Addressing these structural and capacity constraints through a structured skilling and institutional strengthening approach is expected to improve adoption of sustainable practices,

enhance enterprise readiness, and strengthen the functioning of producer institutions. By equipping farmers, youth, and frontline actors with practical skills, market orientation, and technical support, the Green College initiative aims to translate institutional platforms into resilient, market-linked livelihoods and scalable outcomes across APC clusters.

Rationale for the Green College Project

The Green College has been conceptualized as a systemic response to the capacity constraints identified in the APC Completion Report. These include limited technical competencies among farmers and frontline workers, weak enterprise orientation among agro-ecopreneurs and PGs, uneven governance and financial management capacities within PCs, and inadequate extension intensity to support climate-responsive and market-linked agriculture.

By establishing a structured, locally contextual, and practice-oriented training ecosystem, the Green College aims to:

- Strengthen technical competencies in crop production, horticulture, livestock, NPM and allied trades
- Build entrepreneurial and business planning skills to support rural enterprises
- Provide mentoring, incubation, and demonstration-based learning
- Integrate digital tools and advisory systems for wider outreach
- Enhance governance and institutional capacities of PGs, PCs, CRPs, and CSOs

As a state-level platform, the Green College seeks to develop a sustained pipeline of skilled human resources—including Master Trainers, extension workers, community resource persons, agro-ecopreneurs, and PG/PC leaders—capable of delivering consistent advisory support, promoting best practices, and strengthening climate-resilient and market-oriented livelihood systems across APC clusters.

In essence, Green College functions as the strategic backbone for skilling, enterprise development, and institutional consolidation under APC 2.0, ensuring that producer institutions and rural youth are equipped not only to participate in cluster interventions, but to sustain and scale them over time.

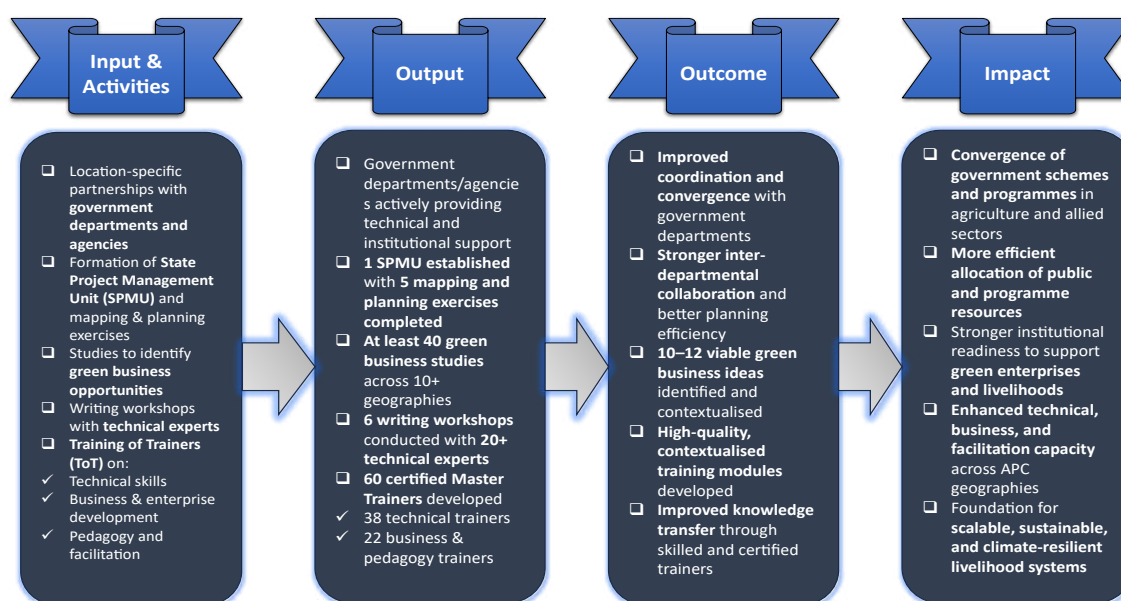


Figure 1: Theory of Change

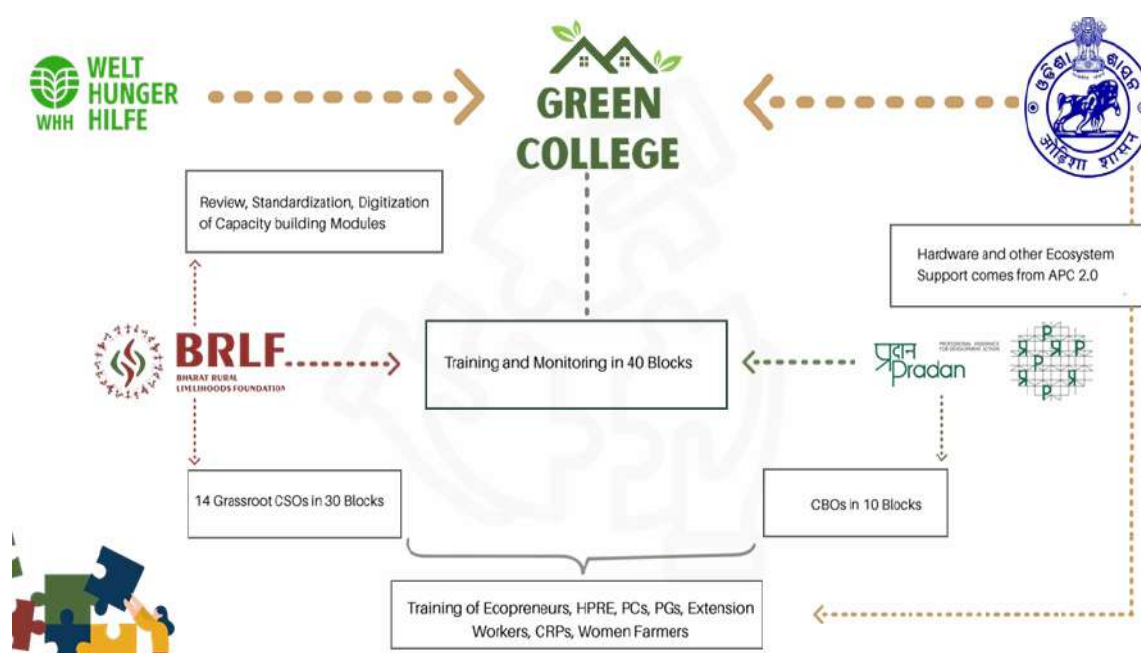
1.2 Roles and Responsibilities

The Green College initiative is operationalized through a dedicated institutional arrangement led by the Bharat Rural Livelihoods Foundation (BRLF) State Programme Management Unit (SPMU), which is responsible for overall programme management, coordination, and day-to-day operational oversight. The SPMU anchors the planning, execution, monitoring, and quality assurance of Green College activities, ensuring alignment with BRLF's strategic objectives on sustainable livelihoods and institutional strengthening.

The Green College programme is funded by Welthungerhilfe (WHH), which provides financial support for programme implementation and capacity-building interventions. PRADAN functions as a key supporting partner, contributing technical expertise, implementation experience, and field-level facilitation in close coordination with the SPMU and other Civil Society Organisation (CSO) partners.

In contrast, the APC programme is jointly funded by BRLF and the Government of Odisha, reflecting a co-investment model aimed at strengthening agrarian livelihoods and community institutions at scale. Under APC, PRADAN serves as the lead implementation partner, with direct responsibility for managing the SPMU, providing strategic and operational leadership, and coordinating the work of other CSO partners across project geographies.

Across both APC and Green College, PRADAN's role includes institutional strengthening, capacity building of field teams and community institutions, curriculum localization, and ensuring effective translation of training and knowledge inputs into field-level practice. Their long-standing presence in tribal and underserved districts enables contextualization of training, local relevance of skilling interventions, and effective integration of learning with livelihood practices.



¹ Manual – Green College Odisha

The APC programme was initiated through a Memorandum of Understanding (MoU) between the Bharat Rural Livelihoods Foundation (BRLF) and the Government of Odisha, represented by the Odisha Livelihoods Mission (OLM), under which both parties committed financial resources for programme implementation. Subsequently, 12 departments and directorates of the Government of Odisha, including OLM, converged to support the initiative, and APC was formally recognized as a State Mission in 2023.

BRLF continues to directly fund the implementation of APC in 40 blocks. In parallel, the Government of Odisha has expanded APC to additional blocks across the state using resources from the District Mineral Foundation (DMF), thereby scaling the programme beyond the originally supported geographies.

PRADAN serves as the lead NGO partner, with responsibility for anchoring the State Programme Management Unit (SPMU) and providing strategic and operational support to other NGO partners involved in programme execution. All NGO partners engaged in APC Phase I and Phase II have received programme funds from BRLF for field-level implementation and institutional strengthening activities.

1.3 Objectives of the Assignment

The baseline study establishes the initial conditions of skills, knowledge, institutional capacities, and digital readiness across APC clusters, providing the evidence needed to design a relevant and demand-driven Green College capacity building ecosystem. It helps identify existing strengths and gaps among rural youth, women farmers, PG/PC institutions, CRPs, and Master Trainers, ensuring that the programs curriculum and delivery mechanisms are grounded in field realities.

The Green College Odisha aims to mainstream climate-resilient agriculture and promote sustainable, market-oriented livelihoods. The baseline provides the foundation for this by mapping current practices, institutional readiness, and enterprise opportunities. It also serves as the starting point for the programs monitoring and evaluation framework, enabling BRLF and partners to track progress, assess improvements, and measure change through subsequent midline and endline evaluations.

Objectives of the Baseline Study: ²

1. Provide measurable insights into the existing capacities of key stakeholders involved in the implementation of the APC project.
2. Provide an assessment of existing training and capacity-building resources used in the APC project
3. Identify existing trades pursued by PGs, PCs, and entrepreneurs and the challenges they face in accessing the markets, supply chain solutions, and technological interventions that enhance the value chain.
4. Map the existing pool/ cadre of master trainers and their capacities in being able to offer training for key stakeholders of the APC project.
5. Map the landscape of digital/ technological solutions used in similar programs to build knowledge and skills and provide active hand-holding support to learners.

² BRLF. (2025). *ToR for Baseline Study – Green College Odisha* (Scope and purpose of assessment)

2 Approach and Methodology

2.1 Approach

The study adopts a **mixed-methods evaluation design**, combining quantitative surveys, qualitative assessments, and institutional diagnostics to ensure a holistic understanding of the Green College Odisha initiative.³ The study applies the P-K-S-A-C framework (Perception → Knowledge → Skill → Attitude → Capability to Act), an operational capacity-assessment model adapted from established behaviour-change and learning frameworks, including the WHO Knowledge-Attitude-Practice (KAP) model, the CEDEFOP Knowledge-Skills-Attitude (KSA) competency model, and the COM-B behavioural system proposed by Michie et al. (2011)⁴⁵⁶

The P-K-S-A-C framework operationalizes behavioural and capacity-development pathways by systematically tracing progression across its core dimensions and associated indicators. Key indicators were identified for each component and measured using binary variables (Yes=1, No=0) to enable consistent quantification and comparative analysis across respondents. Additionally, the entire questionnaire was designed in alignment with this framework, as presented in the **Annexure – IV**.

The P-K-S-A-C framework has been operationalised through a set of clearly defined indicators corresponding to each dimension – Perception, Knowledge, Skill, Attitude, and Capability to Act. For the baseline, most indicators were captured using binary response to ensure clarity, reduce respondent burden, and facilitate reliable field administration across diverse contexts.

While binary indicators are appropriate for establishing initial benchmarks, it is recognised that they offer limited sensitivity to incremental change over time. Accordingly, composite indices for each P-K-S-A-C dimension have been constructed for analytical purposes, and future midline and endline assessments should progressively incorporate scaled response options (e.g. Likert-type measures) for selected indicators to improve sensitivity and reduce ceiling effects.

This phased measurement approach ensures both baseline reliability and longitudinal analytical robustness.

- **Perception (P):** Captures how PG members view or interpret an issue, challenge, or opportunity in their livelihood context.

Indicators Used:

- Perceived importance of sustainable agriculture practices
- Perceived risks of chemical-intensive farming
- Perceived benefits of diversification and improved practices

- **Knowledge (K):** Assesses the information and understanding PG members possess about improved practices, technologies, and systems.

Indicators Used:

³ BRLF. (2025). *Terms of Reference for Baseline Study – Green College Odisha*, Section on Study Approach (Mixed Methods)

⁴ WHO. (2008). *Advocacy, Communication and Social Mobilization for TB Control: A Guide to Developing Knowledge, Attitude and Practice Surveys*.

⁵ CEDEFOP. (2010). *A Handbook for Developing Competency Frameworks*. European Centre for the Development of Vocational Training.

⁶ Michie, S., van Stralen, M., & West, R. (2011). *The behaviour change wheel: A new method for characterising and designing behaviour change interventions*, *Implementation Science*, 6(42).

- Awareness of SRI/SRP, NPM/organic practices
 - Knowledge of soil health, water management, and livestock practices
 - Knowledge of market linkages and institutional services
- **Skill (S):** Measures the practical and technical abilities PG members can apply in real-world situations.

Indicators Used:

- Ability to demonstrate or apply specific practices (e.g., line sowing, composting, livestock vaccination routines)
 - Past use of improved techniques in own fields
- **Attitude (A):** Examines the mindset, motivation, and willingness to adopt new practices or engage in livelihood diversification.

Indicators Used:

- Willingness to reduce chemical inputs
 - Interest in training, experimentation, and enterprise development
 - Openness to collective and market-oriented approaches
- **Capability to Act (C):** Determines whether individuals have the combined ability, confidence, and enabling environment to put knowledge and skills into practice.

Indicators Used:

- Actual adoption of multiple sustainable practices
- Access to inputs, irrigation, livestock, or institutional support
- Participation in PGs/PCs and training follow-up
- Self-reported confidence in continuing practices independently

This design enables the study to measure capacity levels, behavioural shifts, readiness for green livelihoods, and empowerment outcomes across farmer households, youth, Producer Groups (PGs), Producer Companies (PCs), Community Resource Persons (CRPs), extension workers, and master trainers. The pre-post evaluation structure (Baseline → Midline → Endline) ensures comparability over time and supports the assessment of the effectiveness of capacity-building, skilling, and eco-preneurship initiatives.

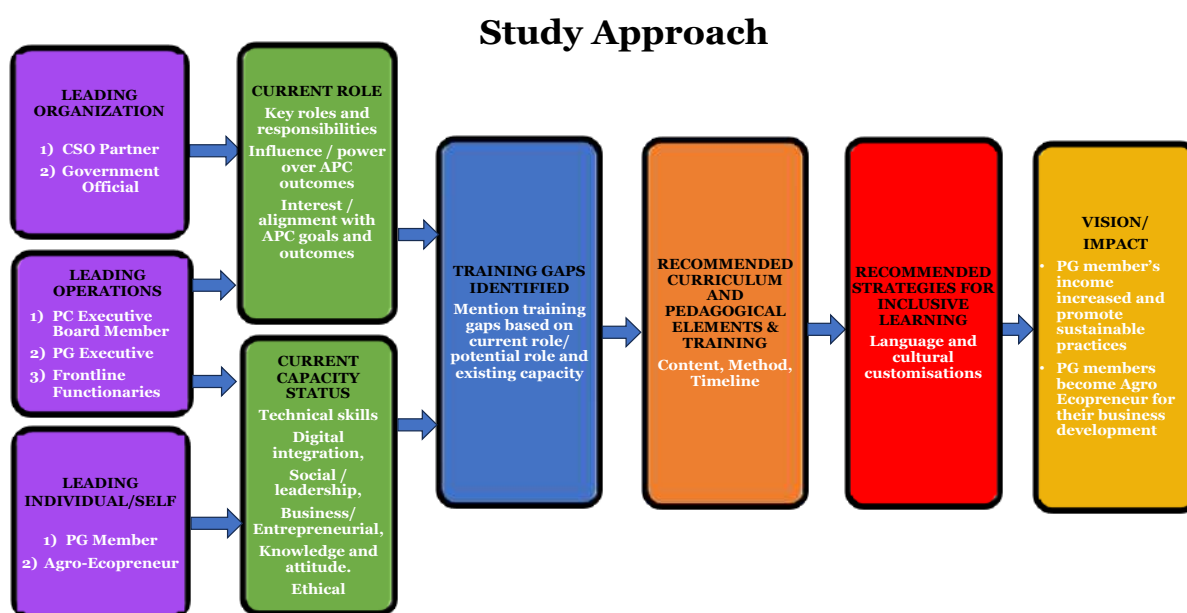


Figure 2: Training Need Assessment Matix

2.2 Study Area: Physical and Demographic Context of Odisha

Key Physical and Demographic Features:

- Odisha is located on the eastern coast of India, covering 155,707 sq. km, accounting for about 4.7% of India's total geographical area. (*Survey of India; Government of India*)
- The state exhibits significant agro-ecological diversity, comprising coastal plains (~28%), central tablelands, and hilly and forested regions (~40%), particularly in southern and western districts. (*NBSS&LUP; Government of Odisha*)
- Agriculture and allied activities are the primary livelihood source, supporting nearly 65% of the population. (*NSS 77th Round; Periodic Labour Force Survey, MoSPI*)
- Agriculture is predominantly rainfed, with around 62% of the net sown area dependent on monsoon rainfall. (*Directorate of Economics & Statistics; Agricultural Statistics at a Glance, Ministry of Agriculture & Farmers Welfare*)
- Small and marginal farmers dominate, with over 91% of operational holdings in this category and an average holding size of about 2.7 acres. (*Agriculture Census 2015-16*)
- Odisha has a largely rural population (83%), with a high share of Scheduled Tribes (22.9%) and Scheduled Castes (17.1%). (*Census of India, 2011*)
- The overall literacy rate is 72.9%, with lower functional literacy levels in tribal and remote areas. (*Census of India, 2011; National Sample Survey*)

These physical and demographic characteristics shape Odisha's agricultural vulnerability, influencing farmers' capacity for technology adoption, institutional engagement, and skill absorption. High dependence on rainfed agriculture, fragmented landholdings, and the concentration of socially disadvantaged groups underscore the need for context-specific interventions. Accordingly, these factors informed the study's sampling strategy and the application of a mixed-methods analytical framework under APC 2.0, ensuring alignment with ground-level realities

2.3 Sampling Design

The baseline study adopted a **mixed-methods design**, combining quantitative, qualitative, and institutional assessments to generate a comprehensive and triangulated understanding of livelihoods, capacities, and training needs under the Green College Odisha initiative. The sampling framework was designed to ensure representativeness across agro-ecological zones, social groups, and institutional contexts, while enabling integration of findings across methods.

(A) Quantitative Survey

The quantitative household survey followed a **stratified multi-stage random sampling design** across **11 districts and 15 blocks** covering inland, and tribal-dominated agro-climatic zones of Odisha. The study covered inland plateau, eastern ghats highland, and tribal-dominated regions, reflecting significant agro-ecological and socio-economic diversity. Stratification ensured representation of varied farming systems, social composition, and livelihood contexts, as well as differential stages of APC implementation across zones. This approach strengthened the comparability and robustness of the analysis across heterogeneous rural settings.

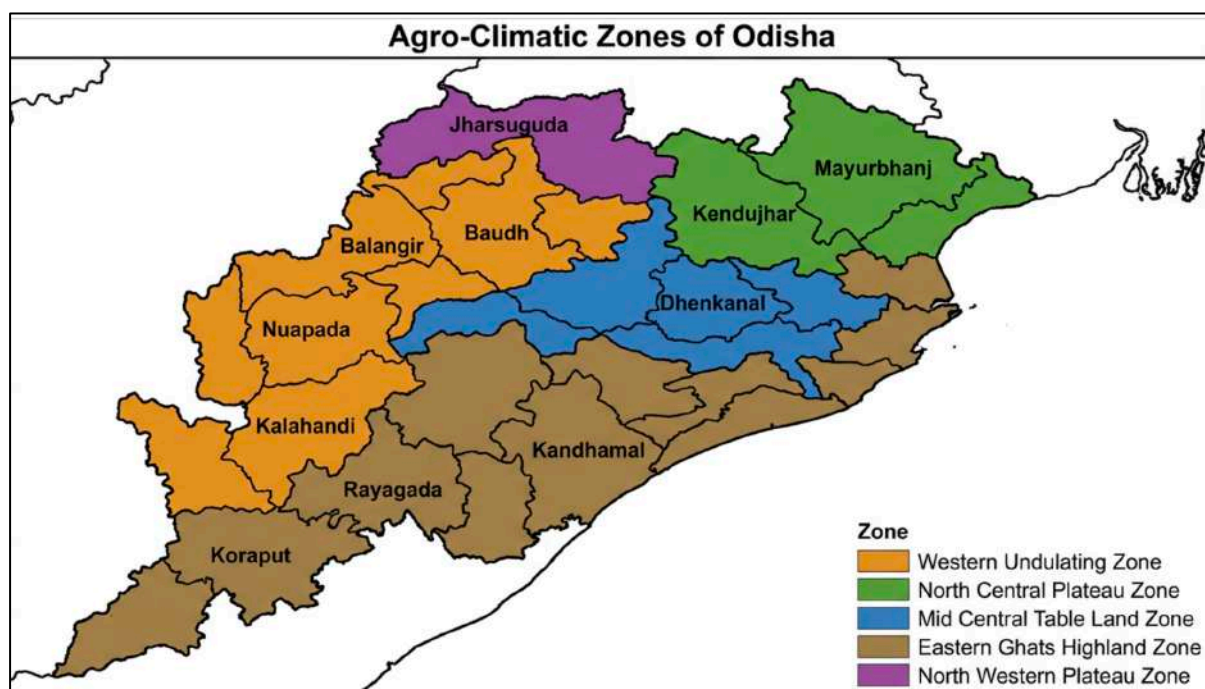


Figure 3: Blocks covered under Baseline study of Green College Odisha Project

Sampling Structure

- **Districts (11):** Stratified by Agro-ecological region (West, South, North) to ensure geographical balance.
- **Blocks (15):** Randomly selected from APC implementation blocks within each district.
- **Villages (45):** Three villages per block selected randomly from PG member lists, ensuring diversity in farming systems and social composition.
- **Farmers (365):** Within each village, 6 PG member farmers were selected randomly from APC project farmers and 2 control farmers were selected randomly from non-participants of similar socio-economic profile. (Project 276 + Control 89).

This unified multi-stage approach minimised selection bias and ensured balanced coverage across programme geographies.

Adequacy of Sample Size

- The farmer survey sample, as **proposed for the baseline study**, comprised **360 respondents** (270 PG members and 90 control farmers). Following **field data collection and validation, the final baseline analysis** was based on **365 farmers** (276 PG members and 89 control farmers). Minor variations in sample totals across tables are attributable to data cleaning, variable-level rejection, and district-wise aggregation. All analyses are based on the final cleaned dataset, as described in **Section 2.5**.
- At a **95% confidence level** and **±5% margin of error**, a sample of around 384 farmers is required for populations exceeding 10,000 farmers.⁷
- In discussions with the BRLF team, the total farmer sample was segregated into PG

⁷ Cochran, W. G. (1977). Sampling Techniques (3rd ed.). New York: John Wiley & Sons.

members and control groups (1/3 of the PG member). The proposed baseline sample provides representative data at the programme level while also enabling subgroup analysis by gender, youth, and tribal status.

The marginal reduction from the indicative benchmark of 384 to 360 implies a **slightly wider margin of error (approximately ± 5.2 per cent)** at the programme level, which is considered methodologically acceptable for a baseline study intended to inform programme design, Training Needs Assessment, and Theory of Change development. Importantly, the study prioritises **analytical robustness over strict population estimation**, supported by stratified sampling, control group inclusion, and subsequent application of Propensity Score Matching (PSM) to strengthen comparability

The quantitative survey captured baseline indicators related to livelihoods, agricultural practices, institutional engagement, and awareness of the Green College Odisha initiative, with deliberate inclusion of women respondents, tribal households, and diverse occupational categories.

Table 1: Quantitative Sample Coverage Summary

Stakeholder	Sample Collected
PG member (per village 6 farmer)	276
Control group Farmer (per village 2 farmer)	89

The table demonstrates balanced coverage across districts, capturing heterogeneity in agricultural conditions, institutional structures, and community profiles.

Table 2: District wise selected villages for study

District	Blocks Covered	Selected Villages	Sample Covered
Balangir	Belpada	1. Dunguri Guda, 2. Khalkhali, 3. Mandadara	26
	Khaprakhol	1. Matiaabahal, 2. Budhi Bahal, 3. Jhankarpali	24
Baudh	Kantamal	1. San Kalara Katha, 2. Gidhamal, 3. Reghamunda	27
Nuapada	Khariar	1. Pakhansara, 2. Mahulkot, 3. kudaldungari	25
Jharsuguda	Laikera	1. Patrapali, 2. Jharbandali, 3. Odiapali	24
Kalahandi	Lanjigarh	1. Kumkhal, 2. Dukriguda, 3. Asurguda	25
Rayagada	Kolnara	1. Sorada, 2. Irkuti, 3. Patraput	24
	Bisamkatak	1. Pichliguda, 2. Tala Barangapadar, 3. Hikiri	24
Koraput	Borigumma	1. Bandaguda, 2. Aniguda, 3. Anchala	24
	Semiliguda	1. Renga, 2. Marla, 3. Dudhari	26
Kandhamal	Baliguda	1. Sudra, 2. Rutungia, 3. Bandespanga	20
Kendujhar	Banspal	1. Rugudi, 2. Sarukudar, 3. Sapakanta	24
	Harichandanpur	1. Madhyapur, 2. Dalki, 3. Bhoka	24
Dhenkanal	Kankadahad	1. Rodanga, 2. Phuljhari, 3. Jarada	24
Mayurbhanj	Thakurmunda	1. Asanbani, 2. Akhapalani, 3. Jamundia	24
Total			365

Control households were selected from non-APC participants residing in comparable villages and sharing similar socio-economic characteristics. While care was taken to exclude direct beneficiaries of APV interventions, it is acknowledged that complete isolation from programme

influence may not be feasible due to geographic proximity, social networks, and exposure to parallel government schemes.

Potential spillover effect may therefore attenuate observed differences between APC and control households at baseline. This limitation is explicitly recognised, and subsequent evaluation rounds will incorporate additional classification of households based on degree of programme exposure, along with analytical strategies to account for indirect effects where feasible.

(B) Qualitative Survey

To complement the quantitative household survey, the study incorporated a systematic qualitative component to capture field-level perspectives, behavioural insights, and experiential knowledge across project geographies. This ensured deeper triangulation of findings and enriched the understanding of skill needs, institutional functioning, and community dynamics.

The qualitative sample covered three primary categories:

- **Key Informant Interviews (KIIs):**
A total of **137 KIIs** were undertaken with Producer Company board members, Producer Group leaders, Community Resource Persons (CRPs), CSO functionaries, frontline extension workers, and relevant government officials from agriculture, horticulture, irrigation, livelihoods, and tribal development departments.
- **Agro-ecopreneurs:**
A total of **45 Agro-ecopreneurs** were interviewed to assess enterprise preparedness, operational practices, service delivery capacity, market engagement, and the constraints shaping rural entrepreneurship.
- **Focus Group Discussions (FGDs):**
15 FGDs were conducted with women farmers, youth groups, PG members, and community representatives to capture collective perceptions, training needs, experiential insights, and community-level dynamics influencing livelihood development.

Details stakeholder of the sample are given: (District wise details in Annexure - II)

Table 3: Qualitative Sample Coverage Summary

Stakeholder (Qualitative Survey)	Sample Collected
APC PMU (BRLF 1 and PRADAN 1)	2
CSOs	14
PC Board Members	15
PC Executives	15
PG Executive	15
CRPs on CSO payrolls	15
Frontline functionaries	30
Government officials (2 Per district)	28
Agro-ecopreneurs (3 per district)	46
FGD (Women Farmers)	15

This qualitative coverage provided critical insights into behavioural change processes, training relevance, institutional interactions, and practical challenges faced on the ground.

Institutional Survey

In addition to household and qualitative assessments, a dedicated institutional survey was undertaken to examine the operational capacities, governance systems, and convergence mechanisms across key institutions.

The institutional component included:

- **Producer Groups Executives :**
Assessment of governance processes, meeting regularity, record-keeping, uptake of training, and linkage with Producer Companies.
- **Producer Companies Executives and Board Members :**
Review of board functioning, business planning, procurement systems, financial management, and coordination with PGs and service providers.
- **Civil Society Organisations (CSOs):**
Evaluation of their role in mobilization, training delivery, field supervision, reporting, and support to community institutions under APC 2.0.
- **Frontline Functionaries (CRPs, Krushi Mitras, Prani Mitras, Udyog Mitras):**
Mapping their technical capacities, operational responsibilities, digital readiness, and role in last-mile advisory services.

This institutional assessment enabled a comprehensive understanding of system-level capacities, gaps, and opportunities, forming a crucial input for designing Green College's training, mentoring, and capacity-building framework.

Mixed Method Integration Strategy

The baseline study adopted an integrated mixed-methods approach to ensure that quantitative, qualitative, and institutional assessments collectively informed analysis, interpretation, and programme design. Rather than treating these components as independent exercises, integration was systematically embedded at the design, analysis, and interpretation stages:

1. **Design Level Integration** was achieved by adopting a common geographical and institutional sampling framework across all study components. The same districts, blocks, and villages selected for the quantitative household survey were used for Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), and institutional assessments. This alignment enabled direct cross-referencing of findings and ensured consistency across data sources.
2. **Analysis Level Integration** involved triangulating quantitative indicators—such as livelihood profiles, adoption of practices, income diversification, and institutional engagement—with qualitative insights from KIIs, FGDs, and institutional diagnostics. Quantitative patterns were examined alongside stakeholder narratives to explain observed variations and constraints, including skill gaps, market access issues, institutional performance, and availability of advisory support. This approach strengthened explanatory depth by linking measurable outcomes with contextual drivers.
3. **Interpretation-level Integration** synthesised evidence from all three components to identify priority training needs, institutional bottlenecks, and differentiated capacity requirements across stakeholder groups. These integrated findings directly informed the

Training Needs Assessment, stakeholder-specific capacity-building pathways, and the articulation of the Green College Theory of Change.

Overall, this integrated mixed-methods strategy enhances analytical rigor and validity, ensuring that Green College interventions are grounded in both empirical evidence and field-level realities, and are responsive to the institutional and livelihood dynamics of APC clusters.

2.4 Baseline Study Research Tools

The baseline study employed a comprehensive suite of research tools covering quantitative, qualitative, and institutional dimensions. Each tool was developed in accordance with the methodological requirements specified in the **BRLF Terms of Reference (2025)** and refined through piloting during the **Inception Phase**.¹

All tools were translated into Odia, field-tested in Dhenkanal district, and subsequently standardised for deployment across 11 districts and 45 villages.

A. Quantitative Assessment Tools

Quantitative tools were designed to generate statistically measurable indicators, establish pre-intervention benchmarks, and enable longitudinal comparison with midline and endline surveys.

Table 4: Detailed Description of Quantitative Tools

Research Tool	Detailed Description & Purpose	Technical Focus / Indicators	Respondent Category
Household Survey Questionnaire (Structured, CAPI-based)	This core tool captured household-level socio-economic, production, training, and behavioural indicators. Developed using BRLF monitoring indicators and APC 2.0 outcome metrics. Administered via CAPI (KoBo/ODK) for real-time validation.	• Demographics • Landholding, cropping pattern, livestock • Training exposure & adoption • KAP/P-K-S-A-C indicators • Income, assets, credit access • Market participation & yield • Digital and institutional access	365 farmers (276 PG member + 89 control)
Agri-Ecopreneur Structured Schedule	Tool designed to assess business practices, enterprise management, market linkages, financial literacy, and profitability. Informed by FAO smallholder entrepreneurship models.	• Business operations • Input sourcing & pricing • Service delivery • Cash flow & profit • Market channels • Training needs	46 agri-ecopreneurs

B. Qualitative Assessment Tools

Qualitative tools generated rich, explanatory insights into community norms, adoption behaviour, institutional functioning, and implementation bottlenecks—core requirements of BRLF's evaluation framework.

Table 5: Detailed Description of Qualitative Tools

Research Tool	Detailed Description & Purpose	Technical Focus / Indicators	Respondent Category
Key Informant Interviews (KIIs)	Semi-structured interviews capturing governance practices, institutional roles, service delivery, and convergence mechanisms. Informed by IFAD/BRLF KII protocols.	• Governance & roles • Institutional coordination • Training systems • Value chain facilitation • Convergence with schemes • Technical support	137 KIIs (PC board members, PG executives, CRPs, CSOs, Govt. officials, master trainers)
Focus Group Discussions (FGDs)	Group-based discussions capturing perceptions, constraints, and community behaviour. Follows FAO's FGD guidelines for rural communities.	• Community perceptions • Gender norms • Skill gaps • Youth aspirations • Market constraints	15 FGDs (women farmers, youth, tribal communities)
Thematic Discussion Protocols	Used for cross-cutting issues such as NPM adoption, water access, migration, entrepreneurship, and gender barriers.	• Constraints analysis • Adoption drivers • Scheme accessibility • Institutional trust	Conducted across all districts

C. Institutional Assessment Tools

Institutional maturity assessment of producer groups, Producer Companies, and CSOs using semi-structured interview schedule as a diagnostic tool covering governance quality, business planning capacity, operational systems, financial management and market management. While findings are presented descriptively at baseline, the assessment framework aligns with a staged institutional maturity model, allowing institutions to be classified across levels of functional readiness.

This approach provides a structured baseline against which improvements in institutional performance and readiness can be tracked at midline and endline and directly informs the prioritisation and sequencing of Green College capacity-building interventions.

Table 6: Detailed Description of Institutional Tools

Research Tool	Detailed Description & Purpose	Technical Focus / Indicators	Institution / Respondent*
Executive Member (Producer Group) Diagnostic Tool	Captures institutional maturity, group governance, record keeping, group mobilisation, and market participation.	• Governance systems • Meeting regularity • Financial literacy	15 PGs

Research Tool	Detailed Description & Purpose	Technical Focus / Indicators	Institution / Respondent*
	Adapted from BRLF's PG Grading Framework. ¹⁰	• Collective procurement & marketing • Linkages with PCs	
Executive and Board Member (Producer Company) Diagnostic Tool	Used to evaluate operational efficiency, business viability, procurement systems, staffing, and revenue flows.	• Board functioning • Financial statements • Aggregation volumes • Business plan quality • Credit & market linkages	30 PCs
CSO Organisational Assessment Checklist	Evaluates staffing, training capacity, monitoring systems, and field infrastructure relevant to Green College activities.	• Staffing & training infrastructure • MIS and reporting • Convergence facilitation	14 CSOs

* Respondent details are given in **Annexure - II**

2.5 Data collection process

Global AgriSystem Pvt. Ltd. (GAPL) follows its institutional Data Collection SOP, which is harmonised with internationally recognised evaluation standards, including the OECD-DAC guidelines, FAO's AGRI Survey framework, and MoSPI's Handbook on Field Surveys. This SOP—encompassing tool finalisation, enumerator training, field piloting, CAPI-based data capture, supervisory checks, back-checking, and ethical safeguards—was rigorously applied during the Green College Odisha baseline.

2.5.1 Survey Preparation

A preparatory meeting was held between **BRLF, PRADAN and GAPL** team members to review the farmer and KII questionnaires. The team provided several suggestions related to sequencing, clarity, translation, and indicator alignment. These inputs were incorporated, and the revised tools were finalised for field use. This collaborative review ensured that the questionnaires were streamlined, context-appropriate, and closely aligned with the objectives of the baseline study.

2.5.2 Training of Enumerators & Supervisors

The training for enumerators and supervisors was conducted from **18–20 September 2025**. The agenda, shared earlier with the BRLF team (Annexure V), covered project orientation, interviewing protocols, and respondent engagement techniques. The sessions introduced the farmer and KII survey tools and included hands-on practice to familiarise the team with both paper-based formats and CAPI-enabled data collection.

The training was facilitated by **BRLF, GAPL and survey team** lead with participation from four supervisors and eight enumerators. The sessions ensured that the field team understood the study objectives, ethical norms, and tool-specific procedures required for reliable and standardised data collection.

Training Structure and Activities

The training was organised over three days and structured into three core components to ensure comprehensive preparation of the field team:

1. **Classroom briefing and hands-on CAPI practice** at CYSD, Bhubaneswar
2. **Field visit and practical administration of questionnaires** at Urbengi Village, Dhenkanal
3. **Feedback, corrections, and tool finalisation discussions** at CYSD, Bhubaneswar

Day 1 – Classroom Training at CYSD, Bhubaneswar

The first day focused on orienting the field team to the APC programme and the Green College Odisha initiative, highlighting the purpose of the baseline and the role of enumerators in ensuring high-quality data. A detailed briefing was provided on interviewer responsibilities, ethical conduct, and appropriate communication with respondents.

This was followed by an introduction to the farmer and agro-ecopreneur questionnaires. Enumerators practiced administering these tools using CAPI devices, learning how to navigate modules, enter responses accurately, and manage skip logic. Supervisors simultaneously reviewed the Key Informant Interview (KII) schedules, discussing anticipated challenges and clarifying technical questions.

During the practice sessions, minor issues related to Odia translations were identified and corrected immediately to ensure clarity and cultural relevance. By the end of Day 1, enumerators were confident in using CAPI, and supervisors provided additional feedback to further refine the instruments.



Figure 4: Photos capture training on day 1 at CYSD Hall

Day 2 – Field Piloting at Urbengi Village, Dhenkanal

The second day focused on field piloting of the survey instruments in Urbengi village, Dhenkanal district, with support from the CSO partner, Shristi Group. The exercise provided enumerators with practical exposure to community settings and allowed real-time testing of the questionnaires. Activities included a Focus Group Discussion (FGD) with 12–15 women farmers, along with practice interviews involving farmers, Producer Group (PG) members, and Producer Company (PC) executives and board members.

During the piloting, certain challenges emerged—particularly in capturing organisational registration information such as dates and years of establishment. With inputs from the CSO partner, these issues were clarified on-site, and improvements were suggested to enhance question clarity and response accuracy.

The piloting played a crucial role in identifying contextual gaps, refining translation nuances, and improving skip logic. It also strengthened the enumerators' confidence in managing field interactions and administering the tools effectively. Overall, the piloting validated the relevance and usability of the survey instruments before large-scale deployment.



Figure 5: Image captured Pilot testing on day 2, Urbengi village, Dhenkanal

Day 3 – Feedback, Revision, and Finalization

On the third day, the team reconvened at CYSD, Bhubaneswar to consolidate learnings from both the classroom sessions and the field piloting. Facilitators and participants jointly reviewed the survey instruments, discussed feedback from enumerators and supervisors, and incorporated field-level insights to improve the tools.

Key modifications were made to strengthen the instruments:

- Corrections in the Odia translations to improve clarity and reduce ambiguity.
- Simplification of questions related to organizational structures for ease of administration. As a result, the final toolkit was prepared, comprising:
- Farmer household questionnaires.
- Key informant interview (KII) schedules for government officers, CSO representatives, and PG/PC leaders.
- Guidelines for conducting focus group discussions (FGDs).



Figure 6: Photo documentation of field data collection

2.5.3 Field deployment

The survey team was divided into four groups (one supervisor and two enumerators each), and each group was assigned to cover the following districts/blocks:

1. **Team -1:** Mayurbhanj – Kendujhar – Dhenkanal
2. **Team -2:** Koraput – Rayagada – Kalahandi
3. **Team -3:** Kandhamal – Nuapada – Balangir
4. **Team -4:** Jharsuguda – Boudh

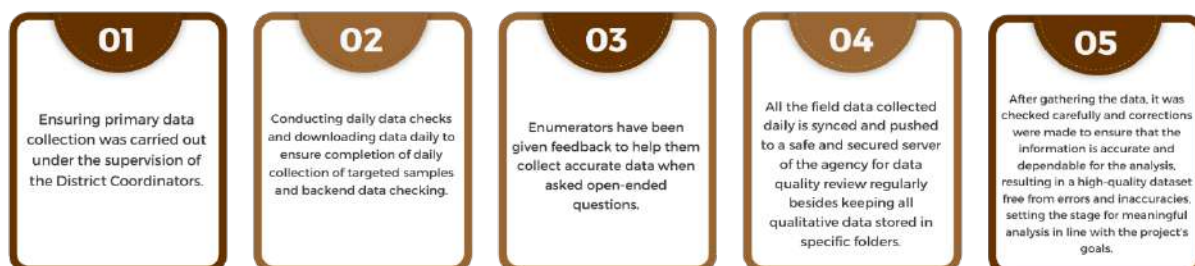
The survey was conducted in two phases, and the detailed timeline of activities has been provided in Annexure VI.

2.5.4 Quality Assurance

Quality assurance and monitoring were integral components of the study design to ensure the accuracy, reliability, and consistency of data collected across all sites. A multi-layered supervision mechanism was established at each stage of the fieldwork. Enumerators and supervisors were provided with detailed training on data collection protocols, use of CAPI tools, and ethical considerations.

Daily field monitoring was conducted by team leads, followed by random back-checks and spot verifications by the central coordination team. Data validation checks, including logic and range tests, were applied to minimize entry errors.

QUALITY CONTROL MEASURES



Data Cleaning Process

Given that this study serves as the baseline benchmark for the Green College Odisha Project, ensuring a high-quality dataset was essential for establishing reliable indicators against which future progress and impact will be assessed. A structured data cleaning process was undertaken to prepare the dataset for analysis. The key steps included:

- **Screening for Missing or Incomplete Responses :** All unanswered or partially completed responses were reverified with field investigators and, where possible, revalidated with respondents to ensure completeness.
- **Logical Consistency Checks :** Cross-variable checks were performed to ensure internal consistency (e.g., total land versus cultivated area, number of livestock versus reported livestock income, gender versus household decision-making roles). Any inconsistencies identified were confirmed with respondents during back-checks.
- **Outlier Detection and Correction :** Extreme or abnormal values that could distort mean estimates or baseline indicators were flagged and validated with the field team, and corrections were made where necessary.
- **Standardization of Units and Codes :** Categorical responses such as crop names, input types, and selling prices were harmonized to maintain uniform coding. Data originally recorded in Odia language were translated into English prior to final compilation.
- **Removal of Duplicate or Invalid Entries :** Duplicate records were identified through respondent ID verification and enumerator cross-checks. Cases with incomplete information or respondents who could not be reached during the verification process were excluded from the final dataset to avoid sample distortion.

2.5.5 Data Quality Assurance and Variable-Level Rejection

Along with standard data-cleaning procedures, a variable-level review was conducted to identify indicators with relatively higher rejection or correction rates during validation. This helped diagnose common sources of error and informed corrective actions before final analysis.

Higher rejection or edit rates were observed primarily for **income and expenditure variables**, largely due to recall bias, seasonality, and difficulty in aggregating income from multiple livelihood sources. Extreme outliers and internally inconsistent values were corrected through back-checks or excluded where verification was not feasible. **Training exposure and scheme participation variables** also required validation due to instances of over-reporting or misattribution between APC-supported trainings and other government programmes; these were cross-verified using programme records.

In contrast, **demographic variables** (age, gender, social category) and **institutional membership indicators** showed minimal rejection, reflecting higher respondent certainty and clear question design. Overall, rejected or corrected records constituted a small proportion of the dataset and did not affect sample representativeness.

The combined use of CAPI checks, manual review, back-checks, and triangulation ensured that only validated and internally consistent data informed the analysis, thereby strengthening the reliability of the baseline findings.

Back-Checking for Verification

Back-checking constituted an essential quality control measure to verify the authenticity of responses and minimize recall or reporting bias. As part of this process:

- **Approximately 15 percent of surveyed households were randomly selected for telephonic verification** : As part of the back-checking process, respondents were contacted by phone and asked 15 to 20 randomly selected questions that they had answered previously. In addition, feedback was collected on whether the enumerator provided adequate time during the interview and maintained appropriate behaviour while conducting the survey. These back-checks helped validate key information related to livelihoods, training access, agricultural practices, and household characteristics.
- **Enumerator performance was simultaneously assessed** : Discrepancies identified during back-checking were used to guide corrective actions, including retraining of data collectors where required, to ensure continued data quality throughout the study period.

2.5.6 Bias Mitigation Strategies During Data Collection

To ensure the reliability, validity, and credibility of baseline findings, the study adopted a set of systematic bias mitigation measures during data collection. These strategies were designed to minimise potential sources of selection, interviewer, and response bias, thereby ensuring that the data accurately reflect field realities and support evidence-based programme decisions under the Green College Odisha initiative.

Key points to mitigate bias during data collection include:

1. **Random Sampling**: Multi-stage random selection of districts, blocks, villages, and respondents was applied to ensure representativeness and reduce selection bias.
2. **Enumerator Training**: Enumerators received structured training on survey instruments, interview protocols, ethical standards, and respondent engagement to standardise data collection and minimise interviewer bias.
3. **Pre-testing of Questionnaires**: Survey tools were piloted prior to rollout to identify and correct ambiguities, sequencing issues, and leading questions, improving clarity and response accuracy.

4. **Assurance of Anonymity and Confidentiality:** Respondents were assured of confidentiality to encourage honest reporting and reduce social desirability bias, particularly on income, adoption, and institutional participation.
5. **Balanced and Neutral Question Framing:** Questions were carefully worded to avoid suggestive or value-laden language, ensuring neutral elicitation of responses across PG member and control groups.
6. **Data Cross-Checking and Triangulation:** Survey responses were cross-validated with qualitative findings from KIIs, FGDs, and institutional assessments to enhance consistency and accuracy.
7. **Field Supervision and Independent Observation:** Supervisors conducted spot checks and monitored enumerator adherence to protocols, helping to detect inconsistencies and prevent procedural deviations.

2.5.7 Ethical Protocols

The study adhered to established ethical principles of social research, ensuring respect, confidentiality, and voluntary participation of all respondents. Prior informed written consent was obtained from each participant before conducting interviews or group discussions. Respondents were informed about the purpose of the study, their right to withdraw at any time, and were assured of anonymity in reporting.

2.5.8 Risk Management and Field Contingencies

A proactive risk management framework was developed to address potential field-level challenges during data collection. These measures collectively ensured smooth execution of field operations with minimal disruptions.

Table 7: Risk and Mitigation Strategies Adopted

Potential Risk	Description of Risk	Mitigation Strategy Adopted
Adverse weather conditions	Rainfall and extreme weather affecting field mobility and interview schedules	Flexible field schedules, buffer days in the work plan, and prioritization of accessible villages during adverse conditions
Accessibility constraints	Difficult terrain and poor connectivity in remote and tribal-dominated areas	Advance route planning, engagement of CSO partners and contingency travel arrangements
Respondent unavailability	Absence of respondents due to agricultural activities, migration, or social events	Use of alternative respondent lists, revisits at different times, and coordination with community leaders
CAPI device malfunction	Hardware or software issues affecting data capture	Deployment of backup devices, offline data capture options, and on-call technical support
Data loss and upload issues	Risk of incomplete uploads or data corruption	Daily data synchronization, secure cloud-based storage, and regular data backups
Enumerator safety concerns	Health, safety, or travel-related risks in the field	Enumerator safety protocols, supervisor oversight, and emergency contact mechanisms
Communication gaps	Delays in reporting field issues to central team	Daily debriefings, real-time communication channels, and rapid escalation protocols

2.6 Secondary Research

A structured desk review was undertaken to triangulate primary data and refining tool design. The table presents the **Secondary Research Matrix**, outlining the domains, sources, purpose, indicators informed, and how the information was used during the baseline.

Table 8: Secondary Research Matrix

Domain Reviewed	Key Secondary Sources Consulted	Purpose of Use in Baseline	Indicators Informed	How It Informed the Study Design
Programme Architecture & Institutional Framework	• APC Phase I Process Guidelines • APC Phase I & II Progress Reports • BRLF Implementation Notes • Green College Concept Notes • PG/PC Governance Manuals • Mission Shakti Institutional Framework	To understand design logic, institutional roles, governance structures, and convergence models under APC & Green College Odisha	PG/PC governance, training pipeline, institutional capacity, convergence pathways	Guided KII tool design, institutional diagnostic checklist, stakeholder mapping
Socio-economic & Demographic Context	• Census of India 2011 & 2021 (where available) • NSSO/NSO Household Consumption & PLFS Reports (2018–2024) • Odisha Economic Surveys 2020–23 • NITI Aayog SDG India Index (State & District)	To establish demographic, educational, caste, household vulnerability, and poverty context	Age, gender, caste, labour participation, income vulnerability	Supported sampling stratification, representativeness, and inclusion indicators
Agriculture, Livelihoods & Farming Systems	• Odisha Agriculture Statistics (2016–17, 2020–21) • OUAT/ICAR–NRRRI Research Outputs • Directorate of Horticulture Reports • CRIDA Rainfed Farming Systems Studies	To map cropping patterns, irrigation, livestock prevalence, agro-ecological zones	Crops, irrigation, livestock, NTFP collection, land distribution	Informed farmer questionnaire design and block/village sampling
Training, Skills & Rural Capacity Building	• APC Training Modules (Agroecology, Livestock, Food Processing, Digital, Value Addition) • Agriculture Skill Council of India (ASCI) QPs • ILO “Skills for Rural Employment” Framework (2019) • FAO Farmer Field School Guidelines	To understand competency-based rural skilling and capacity-building standards	Perception, knowledge, skill, attitude, capability (P–K–S–A–C) indicators	Anchored development of competency assessment scales

Domain Reviewed	Key Secondary Sources Consulted	Purpose of Use in Baseline	Indicators Informed	How It Informed the Study Design
Sustainable Agriculture, NPM & Climate	• FAO Agroecology Framework (2018) • FAO AGRI Survey Farmer Profiling • CEEW Sustainable Agriculture Reports	To benchmark sustainable practice adoption and climate-resilient agronomy	NPM adoption, water management, bio-input use	Strengthened sustainability modules in the tools
Entrepreneurship & Market Linkage	• APICOL AE Guidelines • NRLM/NRETP Livelihoods & Value Chain Reports • APEDA, TRIFED, Spices Board Market Studies • CII/FICCI Agri Entrepreneurship Reports	To understand rural enterprise pathways and market constraints	Market participation, pricing, entrepreneurship readiness	Enhanced AE, PG/PC business practice sections
Digital Access, Literacy & Technology Use	• MoSPI Digital Inclusion Survey (2022–23) • ITU “Measuring Digital Development” (India) • FAO Digital Agriculture Readiness Index	To assess digital divide and inform digital skill indicators	Mobile ownership, ICT skills, digital advisory usage	Defined digital readiness components in survey
Gender, Youth & Social Inclusion	• IFAD Gender & Social Inclusion Framework (2020) • Mission Shakti Reports • UN Women India Gender & Skills Publications	To understand gender-based and youth constraints in livelihoods	Women’s participation, leadership, credit access	Added a social inclusion lens across all tools
Livelihoods, Income & Vulnerability Studies	• BRLF–APC Phase I Baseline Data • NSSO Consumption/Expenditure Data • NABARD State Focus Paper • PLFS Employment Data	To benchmark household income, wage work, migration	Income pathways, wage dependence, occupational mix	Informed income and livelihood categorisation

2.7 Data Compilation and Analysis

2.7.1 Mixed Method Triangulation of Data Sources

The study adopted a **mixed-methods approach**, integrating quantitative and qualitative data sources to enhance the robustness, credibility, and interpretive depth of the findings. Triangulation was systematically applied to combine evidence from structured household surveys with insights from Focus Group Discussions (FGDs), Key Informant Interviews (KIs), and institutional consultations.

Quantitative data provided measurable trends on socio-economic indicators, adoption of agricultural practices, and livelihood outcomes, while qualitative narratives captured perceptions, behavioural dimensions, and institutional dynamics that shaped these outcomes. The integration of both datasets enabled a comprehensive understanding of program effectiveness, identifying not only what changes occurred but also why and how they took place. This mixed-method synthesis strengthened the evidence base for actionable recommendations and policy convergence under the Green College framework.

2.7.2 Analytical Tools and Techniques

A combination of quantitative and qualitative analytical tools and techniques was applied to ensure a comprehensive and rigorous assessment of the baseline data. The selection of analytical methods was guided by the nature of the variables, the structure of the dataset, and the information needs of the Green College Odisha Project. The following tools were employed:

Descriptive Statistical Analysis

Descriptive statistics were used to summarize and present key characteristics of the respondents. Measures such as frequencies, percentages, means, and standard deviations helped in understanding demographic patterns, livelihood profiles, resource ownership, training needs, and adoption behavior. This provided a foundational understanding of the status of farmer households.

Unless otherwise stated, all percentages reported in the analysis are calculated within the relevant respondent category Producer Group (PG) members, control farmers, or the total sample, as applicable.

Cross-Tabulation and Comparative Analysis

Cross-tabulation was used to examine the relationship between categorical variables such as gender, training received, livelihood activities, and adoption of improved practices. Comparative analysis between project and control groups helped identify differences in awareness, access to services, and performance indicators.

Propensity Score Matching Analysis

Propensity Score Matching (PSM) has been applied at the baseline stage as an exploratory and diagnostic analytical tool to assess comparability between APC-supported households and non-APC households with similar observable characteristics. The objective of applying PSM at this stage is to identify systematic differences in socio-economic profiles, resource endowments, and exposure variables that may influence future outcomes, and to strengthen the internal validity of descriptive comparisons.

The propensity score was estimated using observable household-and farm-level covariates including landholding size, irrigation access, livestock ownership, household size, social category, baseline income category, and prior training exposure. Post-matching balance diagnostics were examined to assess the reduction in observable differences between treatment and control groups. Detailed balance statistics are presented in Annexure VIII.

It is explicitly noted that baseline PSM estimates do not constitute causal impact estimates. Given the absence of pre-intervention outcome data and random assignment, the results should be interpreted as indicative associations rather than programme attributable effects. Causal attribution will be addressed through appropriate quasi-experimental methods at endline, including repeated PSM, difference-in-difference analysis, and longitudinal comparison, subject to data availability and panel retention.

The baseline PSM exercise therefore serves as a preparatory step for strengthening future impact evaluation and for informing programme design, rather than as evidence of impact at the baseline stage.

Regression Analysis

Logistic and multiple regression models were used to analyze the influence of socio-economic and program-related factors on key outcomes such as adoption of improved practices, willingness to become ecopreneurs, and livelihood diversification. These techniques helped in identifying significant predictors and understanding the strength and direction of relationships between variables.

Qualitative Analysis of Open-Ended Responses

Open-ended responses from PG members and community members were analyzed using thematic coding. This helped capture insights on lived experiences, constraints, training needs, and perceptions that could not be fully expressed through structured questions.

Use of Statistical Software (SPSS/ Excel/ Kobo API)

Analytical processing was carried out using SPSS and MS Excel. SPSS was used for advanced statistical tests such as regression analysis, cross-tabulation, and reliability checks, whereas Excel supported data cleaning, coding, tabulation, and graphical representation. Kobo Toolbox provides automated validation checks during data collection.

2.8 Limitations in Conducting the Baseline Survey

A few methodological limitations were encountered during the conduct of the baseline study:

- **Recall-related inaccuracies:** Some indicators relied on respondents' ability to recall past agricultural activities, income, training exposure, or input usage. As human recall is inherently imperfect, certain responses may reflect approximation rather than precise memory, which can influence the accuracy of self-reported data.
- **Income Measurement and Interpretation:** Household income estimates were derived from self-reported cash and in-kind earnings across agriculture, livestock, wage labour, and enterprise activities over the preceding agricultural year. Given the seasonality of rural livelihoods, reliance on recall, and the prevalence of multiple income sources, these estimates are subject to measurement error. Income figures should therefore be interpreted as indicative magnitudes rather than precise monetary values. To mitigate bias, income data were triangulated with asset ownership, livelihood diversification and institutional participation indicators, and qualitative insights, rather than as precise

measures of welfare change. Future evaluation rounds should incorporate additional distributional measures, including income bands and median values, to further strengthen robustness.

- **Treatment of statistical uncertainty:** Estimates presented in the quantitative analysis are subject to sampling variability. While point estimates are reported for clarity, small differences, particularly across sub-groups, should be interpreted cautiously. Patterns consistently observed across multiple indicators and corroborated by qualitative evidence are considered more robust
- **External contextual changes:** Variations in market conditions, seasonal factors, local administrative activities, or community-level events during the data collection period may have influenced respondent behaviour and responses. While such external factors are beyond the control of the study team, all possible measures were taken to minimise their influence and maintain consistency in data collection protocols.
- **HH Sample :** During the data collection process, efforts were made to maximise coverage under the quantitative survey. However, due to the Dussehra festival, the survey had to be conducted in two phases. During this period, the availability of respondents was limited, particularly among Producer Group (PG) members, as many female members were engaged in festival-related and household responsibilities and were therefore unable to participate fully in the survey. In addition, a proportion of eligible respondents were unwilling to spare sufficient time for interviews, which affected participation levels in some locations.

This baseline establishes the reference point for a phased evaluation design encompassing midline and endline assessments. Subsequent rounds will focus on measuring changes in capacity, behaviour, institutional performance, and livelihood outcomes using comparable indicators and sampling structures.

Subject to feasibility, panel tracking of households and institutions should be prioritised to enable longitudinal analysis. Where panel retention is not feasible, repeated cross-sectional designs should be employed with appropriate statistical controls. The baseline indicators and analytical frameworks presented here provide the foundation for assessing programme effectiveness and contribution over time.

3 STUDY FINDINGS

This chapter presents the consolidated findings emerging from the baseline assessment of the Green College Odisha project. The analysis integrates evidence from quantitative household surveys, qualitative interactions with community stakeholders, and institutional diagnostics of Producer Groups, Producer Companies, and implementing partners. Together, these findings provide a comprehensive understanding of the socio-economic conditions of PG members, prevailing livelihood systems, adoption of climate-resilient practices, training and capacity-building gaps, enterprise readiness, and the institutional ecosystem within APC clusters. The results serve as the benchmark against which future progress, midline outcomes, and endline impacts will be assessed.

This chapter is structured around three core components:

1. Quantitative Findings (*Household-Level Evidence*)

This section presents statistically derived insights from the household survey, covering:

- Socio-economic and demographic characteristics
- Livelihood and income diversification patterns
- Adoption of agricultural and allied practices
- Access to extension, input, and market services
- Exposure to training and awareness of Green College
- Digital readiness and financial inclusion
- Enterprise aspirations and constraints

2. Qualitative Findings (*Community and Stakeholder Perspectives*)

This section synthesises insights from Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs), capturing:

- Perceptions on livelihood challenges and opportunities
- Behavioural drivers influencing adoption of improved practices
- Gender and youth perspectives in agriculture
- Service delivery gaps across training, advisory, and market access
- Community expectations from the Green College
- Social norms affecting participation, mobility, and decision-making

3. Institutional Findings (*Governance and System-Level Capacities*)

This section draws from institutional assessments conducted with PGs, PCs, CSOs, and frontline departments, focusing on:

- Governance structures and operational maturity
- Human resource and CRP capacities
- Existing training systems, tools, and convergence with state departments
- Market linkage systems, aggregation processes, and value-chain readiness
- Institutional challenges affecting last-mile service delivery
- Opportunities for strengthening the skilling ecosystem under APC 2.0

3.1 Quantitative Analysis

This section presents the quantitative findings comparing APC (Project) farmers and Control farmers across the study districts of Odisha. Quantitative results presented in this section are primarily descriptive and associational in nature. Differences observed between APC-supported

and non-APC households reflect patterns in the baseline data and should not be interpreted as causal programme impacts. Regression and matching analyses are used to examine correlates of adoption and livelihood outcomes and to improve comparability across groups based on observable characteristics.

3.1.1 Socio-Economic Profile of Respondents

To ensure that the quantitative analysis yields unbiased and meaningful comparisons, it is essential that Project (APC) and Control households share comparable socio-economic characteristics. Participation in APC activities is not random and may be influenced by pre-existing household attributes such as age, education, landholding size, occupation, and prior exposure to development interventions. Without addressing these differences, observed variations in outcomes could reflect selection bias rather than programme effects.

Therefore, **Propensity Score Matching (PSM)**⁸ was applied to statistically balance baseline characteristics between APC PG member households and control households. PSM estimates the probability of programme participation (propensity score) for each household based on a set of observed covariates and then matches PG member households with non-PG members having similar propensity scores.

In this study, the propensity scores were estimated using key baseline covariates, including:

- Age of household head
- Educational attainment
- Operational landholding size
- Primary occupation and livelihood profile

A **one-to-one (1:1) nearest neighbour matching approach** was employed, whereby each PG member was matched with the most comparable control farmer based on these characteristics. Observations without suitable matches were excluded to maintain balance and comparability.

Table 9: Propensity Score Matching (1:1) sample

Metrix	Result
Total sample size	365
Treated (PG members)	276
Control farmers	89
Mean Propensity Score Difference (Before Matching)	0.0954
Mean Propensity Score Difference (After Matching)	0.0004

The PSM results demonstrate that the matching process was highly effective. Prior to matching, the mean propensity score difference of 0.0954 indicated a notable socio-economic imbalance

⁸ PSM statistically balances the background characteristics so that any differences observed in outcomes can be attributed more reliably to programme exposure rather than to pre-existing differences between groups. This step enhances the internal validity and robustness of the baseline analysis.

between APC and control households. After matching, this difference declined sharply to 0.0004, indicating near-perfect balance across observed covariates.

In practical terms, PSM ensures that outcomes are compared between households with similar socio-economic profiles effectively comparing “like with like.” By substantially reducing baseline differences, subsequent comparisons of livelihood outcomes, adoption of sustainable practices, and training exposure can be more credibly attributed to APC interventions rather than pre-existing demographic or economic differences. This strengthens the methodological rigor of the baseline analysis and provides a robust foundation for midline and endline impact assessments.

3.1.1.1 Social Category Distribution

Understanding the social composition of respondents is critical for assessing whether APC interventions are effectively reaching historically marginalised and priority groups, particularly Scheduled Tribes (STs) and Scheduled Castes (SCs), as envisaged under APC 2.0. Social category distribution also provides insight into the inclusiveness of programme outreach and institutional participation. The sample distribution of social categories among PG members and Control farmers is presented below:

Table 10: Social category of farmers (%)

Social Category	PG Member (n=276)	Control Farmers (n=89)
General	0.7%	1.1%
Scheduled Caste (SC)	15.9%	13.5%
Scheduled Tribe (ST)	52.0%	59.5%
Other Backward Class (OBC)	31.4%	25.8%

The baseline survey indicates that PG members are predominantly tribal, with **52.0 per cent ST households**, although this proportion is marginally lower than in control areas (59.5 per cent). At the same time, APC areas show **greater social diversity**, reflected in higher participation of OBC (31.4%) and SC households (15.9%) compared to control locations. This pattern suggests that APC interventions are reaching a broad spectrum of socially disadvantaged groups rather than being concentrated within a single social category.

Overall, the findings align with APC 2.0’s objective of engaging ST, SC, and resource-poor farmers. Going forward, outreach strategies may be further strengthened in high-ST blocks to ensure balanced representation of all social groups within Producer Groups, Producer Companies, and Green College training programs.

3.1.1.2 Education Status

The educational profile of respondents is a key determinant of training design, learning absorption, and adoption potential. Understanding literacy and schooling levels is therefore essential for shaping Green College’s pedagogy, training materials, and delivery mechanisms.

The distribution of education levels among PG members and Control farmers is presented below:

Table 11: Educational Status of farmers and Corresponding Respondent (%)

Educational Status	PG Member (n=276)	Control Farmers (n=89)
Illiterate	37.2%	25.8%
Primary	26.0%	31.5%
Secondary	22.4%	21.3%
Higher Secondary	12.3%	15.7%
Graduation	2.2%	5.6%

The baseline findings show modest educational attainment among APC farmers, with a substantial proportion being illiterate (37.2%) or having only primary education (26.0%). Illiteracy is notably higher among APC respondents than among control farmers (25.8%), indicating that APC PG members are drawn largely from socially and educationally disadvantaged households. In contrast, slightly higher levels of primary and higher secondary education among control farmers may reflect greater access to alternative livelihood options or weaker mobilization into APC-supported activities.

These findings underscore the need for Green College training to be **simple, practical, and highly accessible**. Training approaches must prioritize visual aids, hands-on demonstrations, peer learning, and field-based practice, alongside functional literacy and numeracy support. Such strategies are critical to ensure meaningful participation of women, tribal farmers, and low-literacy households, thereby maximizing the effectiveness of Green College interventions.

3.1.1.3 Household Size and Occupation Pattern

Household size and occupational structure provide important insights into dependency ratios, income pressure, and vulnerability to livelihood shocks. These indicators help contextualize the need for income diversification and skill enhancement within APC clusters.

Baseline findings indicate that PG members tend to have slightly larger family sizes (5–6 members) than control households (4–5 members), reflecting joint or extended family structures and higher dependency burdens. Agriculture remains the primary occupation for both groups, but reliance on farming is significantly higher among PG members (93.5%) compared to control households (88.8%). This suggests limited access to alternative livelihood options among PG members.

From secondary source, livestock rearing supplements income for 59.8 per cent of PG members, while 40.2 per cent engage in wage labour, petty trade, or seasonal migration. In contrast, control households show higher dependence on wage labour (49.4%) and livestock (48.3%), indicating coping strategies in contexts where agriculture alone is insufficient.

The high reliance on agriculture and livestock as primary and secondary income sources highlights the livelihood fragility of households across PG members. Heavy dependence on farming with limited diversification increases economic risk and reduces resilience to shocks. For Green College, these patterns underscore the importance of skill-building that supports diversification, improved farm productivity, and value addition.

Green College training modules should prioritise practical skill enhancement in income diversification such as improved livestock management, market-oriented vegetable cultivation, small enterprise development, and climate-resilient farming practices. Strengthening these areas will help households reduce vulnerability, stabilise income, and build sustainable livelihoods that do not rely solely on agriculture.

3.1.1.4 Status of Membership of Collectives

Institutional membership is a key pathway through which APC interventions aim to strengthen collective action, market access, and enterprise development. Examining membership patterns helps assess the depth of institutional engagement beyond basic mobilisation.

Table 12: Member information of farmers (%)

Members	PG members (n=276)*
Producer Group	91.3%
Producer Company	29.7%

* Multiple response recorded

The baseline indicates strong mobilization at the primary level, with **91.3 per cent of APC farmers participating in Producer Groups**. However, only **29.7 per cent are members of Producer Companies**, reflecting limited progression into higher-order institutions. Which indicates limited awareness of PC benefits, perceived procedural complexity, trust deficits, and weak visibility of business returns in nascent PCs.

“Farmers join PGs easily, but PCs are still not clear to them. They ask what benefit they will get after paying fees.” PG Executive member, KII, Kandhamal district

Qualitative findings indicate that low participation in Producer Companies is primarily due to membership fees, perceived lack of additional benefits, and comparisons with non-APC Farmer Producer Organisations (FPOs), which often provide similar services without charging membership fees or associated costs.

Although women are active members within PGs, their representation in leadership roles remains limited. These findings highlight the need for Green College training to strengthen institutional literacy, leadership development, business understanding, and governance capacities to support farmer transition from PGs to PCs and enhance women’s participation in decision-making roles.

3.1.2 Livelihood and Income Diversification Patterns

3.1.2.1 Income and Expenditure Patterns

The baseline indicates that project households have a higher average annual income (₹69,400) compared to control households (₹57,600). Income sources in APC areas are more diversified—60% from agriculture, 20% from livestock, and 20% from allied enterprises—whereas control households depend heavily on wage labour (≈45%).

This diversification suggests greater livelihood stability among project farmers. Additionally, project households demonstrate higher reinvestment in productive assets and farm inputs, reflecting better financial awareness and a stronger orientation toward long-term farm improvement. Strengthening entrepreneurship skilling and financial literacy within the Green

College curriculum can further support income diversification and asset-building behaviour among smallholders.

3.1.2.2 Landholding and Land Type Status

Understanding landholding patterns is essential for designing Green College training modules on improved land-use planning, soil management, and irrigation efficiency. The comparative landholding status of APC (Project) and Control farmers is presented below.

Table 13: Landholding and Land type status of farmers (%)

Land Attribute / Practice (acres)	PG Member (n=276)	Control Farmers (n=89)
Own Land	2.2	1.7
Leased-in Land	0.4	0.4
Leased-out Land	0	0
Total Operational Holding	2.6	2.1
Rainfed Land	2.0	1.9
Irrigated Land	0.6	0.2
Total Cultivated Land	2.6	2.1

The combined results show that PG members operate slightly larger agricultural holdings (2.6 acres) than control households (2.1 acres), primarily due to higher owned land. Both groups lease in similar amounts of land, and no leased-out land is observed.

PG members also have better access to irrigated land, though cultivation remains predominantly rainfed for both groups. Importantly, all operational land is fully cultivated in both populations, indicating complete utilisation of available farmland.

The land profile highlights the need for Green College to focus on:

- Water-efficient irrigation systems for low-irrigation areas
- Rainfed agriculture improvement techniques
- Soil and moisture conservation modules
- Land-use optimisation for small and marginal farmers

Such training will directly address the constraints reflected in the baseline and enhance productivity across APC clusters.

3.1.2.3 Livestock Ownership

Livestock ownership is a critical indicator of asset accumulation, income diversification, and resilience, particularly in rainfed and tribal regions. Assessing livestock patterns also helps determine whether APC interventions have directly or indirectly supported asset creation.

Table 14: Having Livestock status of farmers (%)

Farmers Having Livestock's	PG Member (n=276)*	Control Farmers (n=89)
Cow & Buffalo	44.6%	12.0%
Goat/sheep	46.0%	13.4%
Poultry	52.5%	13.8%

* Multiple response recorded

Across all three livestock categories, the **Project households exhibit substantially higher ownership** than Control households.

- **Cow/Buffalo ownership** is nearly *four times higher* in Project households (44.6% vs. 12%).
- **Goat/Sheep ownership** is more than *three times higher* (46% vs. 13.4%).
- **Poultry ownership** is almost *four times higher* (52.5% vs. 13.8%).

Qualitative findings indicate that APC did not uniformly provide direct livestock asset transfers; however, its interventions—particularly training on integrated farming systems, facilitation of access to government schemes, strengthened veterinary outreach through Community Resource Persons (CRPs), and promotion of diversified livelihood strategies—significantly enabled livestock adoption and expansion among PG member households.

Livestock plays a vital role in regular income generation, nutritional security, and risk buffering. The findings reinforce the importance of integrating structured livestock management, enterprise development, and value-chain training within the Green College framework to consolidate and scale these gains.

FGD evidence from districts such as **Koraput, Kandhamal, Rayagada, and Kalahandi** confirms that higher livestock ownership among APC households is largely attributable to indirect capacity-building and institutional convergence support rather than direct asset provision. These findings highlight the need to integrate structured training on scientific livestock management, enterprise development, and value-chain linkages within the Green College framework to consolidate and sustainably scale livelihood gains across APC clusters

3.1.2.4 Mobile Phone Access

The baseline findings show high penetration of mobile phones across both APC and control households, with a stronger presence of smartphones in APC areas.

- **82.6%** of PG members own smartphones, compared to **77.5%** in control areas, indicating wider access to digital tools within APC clusters.
- However, **12.7%** of APC households and **20.2%** of control households still rely on basic feature phones, highlighting a segment with limited internet access and constrained use of digital advisory services.

Table 15: Phone status with its utilization and income status of farmer

Phone status	PG member (n=276)	Average Income	Use of Phone
No phone and Basic phone	48	48500	Only calling
Smart Phone	228	73800	WhatsApp-based modules, audio notes, and short videos are effective

smartphone ownership is associated with higher income, the pattern of use suggests that income alone does not drive digital sophistication. Instead, usability, affordability of data, network stability, and relevance of content determine adoption. These findings reinforce the appropriateness of Green College's proposed digital delivery strategy, which emphasises WhatsApp-enabled learning, audio-visual micro-content, and facilitator-supported group dissemination, ensuring inclusivity for both basic and smartphone users.

APC households demonstrate slightly higher digital readiness, which may be attributed to previous mobilisation efforts and exposure to ICT-based communication channels in APC villages.

Green College aims to integrate **digitised training modules, e-learning content, and ICT-enabled advisory services**. Effective utilisation of these tools requires reliable smartphone access and basic digital literacy.

Strengthening **digital literacy**, promoting **smartphone adoption**, and providing **support for using advisory apps and training content** will be essential to ensure that all learners—especially women, ST households, and basic-phone users—can fully benefit from Green College’s digital skilling ecosystem.

3.1.2.5 Cropping Pattern in the Study Area

Understanding the cropping pattern is essential for analysing household production behaviour, identifying income opportunities, and designing relevant Green College training modules. The study area reflects a predominantly paddy-based system complemented by diverse vegetable cultivation and emerging commercial crops. This pattern directly influences the type of skills required, the potential for enterprise development, and the scope for climate-resilient agriculture interventions.

Dominance of Cereal Crops

Paddy cultivation accounts for **91.7%** of households, making it the primary staple and major source of livelihood. Other cereals and pulses—such as **ragi (20%)**, maize, green gram and mustard—are cultivated in smaller proportions.

- Indicates high dependence on monsoon-based agriculture.
- Reflects low diversification and vulnerability to climatic shocks.
- Shows the need for improved paddy management and input efficiency.

The cereal-heavy system suggests subsistence-oriented farming with limited crop rotation. Productivity gaps are likely due to inadequate irrigation, soil health constraints, and minimal mechanisation.

Green College can prioritise skill development in **System of Rice Intensification/System of Rooted Paddy (SRI/SRP) methods**, promotion of **climate-resilient** and **water-efficient paddy varieties**, **soil testing** with balanced micronutrient management, and water-use efficiency practices. In addition, training should explicitly focus on **diversification of the crop portfolio** including short-duration, low water-requiring crops and suitable non-paddy alternatives to reduce pressure on water resources and enhance climate resilience. Introducing **water-efficient varieties** across both paddy and diversified crops will support sustainable water use while maintaining productivity and income stability.

Diversity in Vegetable Cultivation

Vegetable cultivation is more varied and includes brinjal (**28.6%**), tomato (**23.9%**), bitter melon (**11.6%**) and chilli (**10%**). Additional crops—such as leafy vegetables, cabbage, okra, onion, cucumber, bottle gourd and mushrooms—are grown in smaller pockets.

- Vegetables provide short production cycles and quicker cash returns.
- Enhance household nutritional security.
- Offer opportunities for collective marketing and eco-preneurship.

The diversity suggests a shift towards market-responsive cropping in some blocks. Farmers are gradually adopting high-value crops where irrigation and market access permit. Detail table including crop type, Season also with Cluster form in Annexure - III

Implications for Green College

- Develop Cluster wise vegetable training.
- Promote vegetable nursery enterprises.
- Introduce low-cost protected cultivation.
- Demonstrate organic/NPM vegetable production.

Emerging Commercial Crops

High-value crops such as **ginger, sunflower and watermelon** are being adopted on a limited scale, signalling early market linkage potential.

- Higher profitability compared to cereals.
- Supports livelihood diversification and risk reduction.
- Can be integrated with Producer Group/Producer Company marketing.

Table 16: Seasonal Calendar, Market Window, and District Focus

Crop	Production Season	Market Window	Indicative Districts	Enterprise Opportunity
Watermelon (Seasonal)	Jan–Feb (sowing) → Apr–May (harvest)	Peak supply period	Mayurbhanj, Balangir	Moderate prices; suitable for bulk sales through PG aggregation
Watermelon (Off-season / Non-seasonal)	Oct–Nov (sowing) → Jan–Feb (harvest)	Lean supply period	Ganjam, Kalahandi	High-value niche market; strong scope for enterprise-led cultivation
Ginger	May–June (sowing) → Dec–Jan (harvest)	Stable year-round demand	Kandhamal, Koraput	Suited for staggered sales, storage, and collective marketing
Sunflower	Nov–Dec (rabi) / Jan–Feb (summer)	Apr–June	Bargarh, Subarnapur	Crop diversification with lower water risk and oilseed markets

The evidence on seasonality and price differentials directly informs Green College’s enterprise-led skilling strategy. Off-season watermelon cultivation in districts such as Ganjam and Kalahandi, where irrigation access and market connectivity exist, presents a clear opportunity for high-margin, short-duration enterprises. Similarly, ginger cultivation in tribal districts like Kandhamal and Koraput aligns with staggered income generation and collective marketing models, while sunflower offers a risk-mitigating diversification option in irrigated rabi systems.

Though not widespread, these crops indicate farmers’ willingness to explore income-enhancing alternatives, provided they receive assured markets and input support.

Implications for Green College

- Introduce training on ginger nursery management, value addition and disease control.
- Provide guidance on commercial cropping under water-efficient systems.
- Strengthen market intelligence for high-value crops.

Block-wise Vegetable Cluster Mapping

Each block demonstrates unique crop combinations, as illustrated in **Figure 5**, indicating micro-agro-ecological niches suitable for cluster-based interventions.

- Enables focused crop planning.
- Helps identify anchor crops for training and enterprise pathways.
- Supports Green College in establishing demonstration sites aligned with local demand.

The cropping pattern reveals a landscape transitioning from **paddy-dominant subsistence farming** to **diversified vegetable-based and emerging commercial agriculture**. This mix creates a strong foundation for Green College to promote skill-based livelihoods, increase productivity, and support climate-resilient practices.

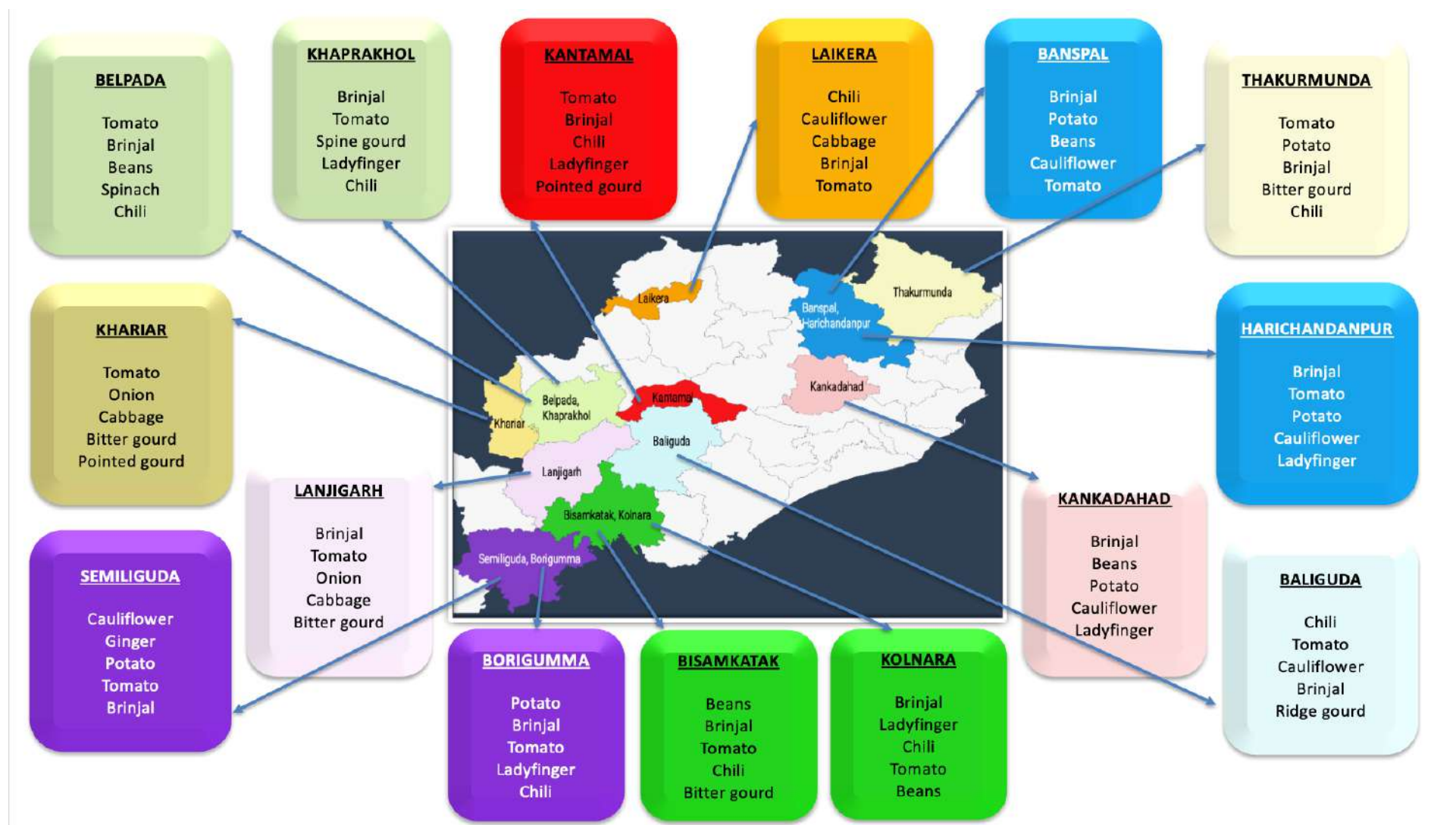


Figure 7: Block wise vegetable crops

3.1.3 Adoption of agricultural and allied practices

3.1.3.1 Understanding and Adoption of Sustainable Agriculture Practices

A clear understanding of sustainable agriculture is fundamental for designing effective Green College training and ensuring long-term behavioural change among farmers. The baseline findings show a consistent pattern: **project farmers exhibit higher awareness, stronger training exposure, and greater adoption of improved agronomic practices** compared to the control group. This reflects systematic capacity-building efforts and the influence of demonstration-driven learning.

Awareness of Sustainable Agriculture Practices

Awareness is the first step in the adoption pathway. Without correct knowledge, farmers cannot make informed decisions about transitioning to sustainable practices, especially those requiring behavioural adjustments (e.g., reduced chemicals, improved spacing, crop rotation).

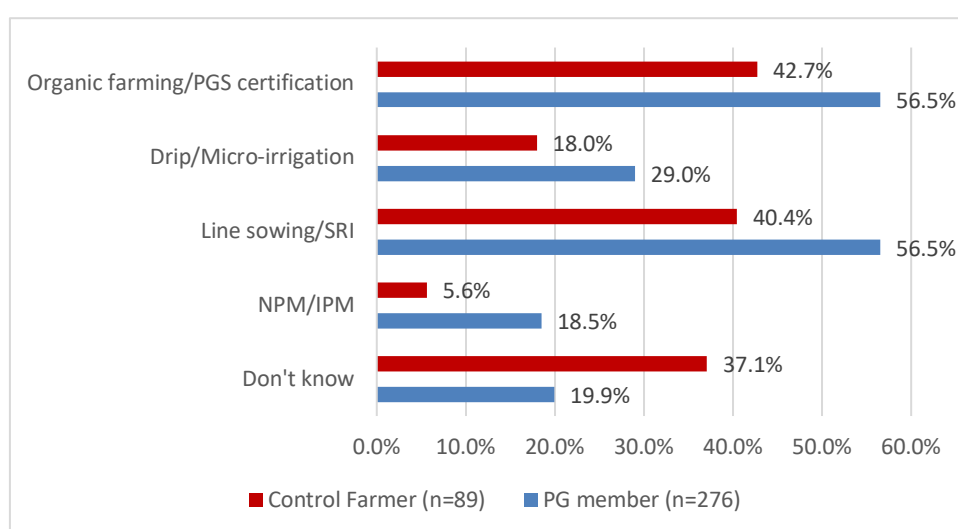


Figure 8: Farmers Awareness about Sustainable Agriculture Practices*

* Multiple response recorded

The baseline results show that **project farmers have substantially higher awareness of sustainable agricultural practices** compared to control farmers. They are better informed about key techniques such as line sowing/SRI, organic and natural farming, integrated pest management, crop rotation, and micro-irrigation systems.

“Youth want to try new practices, but without regular guidance we feel unsure. One mistake can cause big losses.” FGD, Kalahandi district.

The Training modules should continue strengthening basic awareness, especially for low-literacy participants. Content must remain simple and farmer-friendly so that concepts are easily understood. Awareness-building should precede skill development and behavioural change, following the P-K-S-A-C pathway (Perception → Knowledge → Skill → Attitude → Consistent Practice) to ensure a gradual and sustained shift toward improved agricultural practices.

Note: Training refers to exposure/ learning any time prior to this baseline survey and not necessarily the APC implementation period.

Training Received in Agricultural Practices

The training data reveals a clear and consistent pattern: project farmers have received substantially more training across all agricultural subjects compared to control farmers. The highest participation is observed in high-value crops (61.6%), organic/natural farming (43.5%), improved crop production (40.9%), and post-harvest management (22.5%).

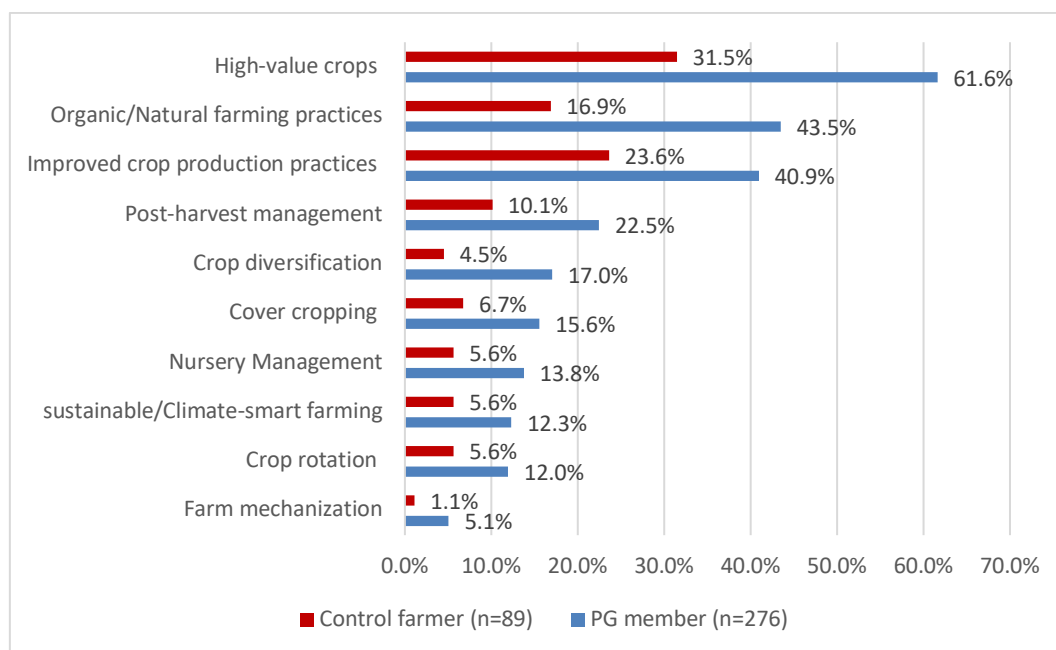


Figure 9: Farmers (%) Received Training in Agriculture Practices*

* Multiple response recorded

The baseline findings clearly show that farmers have received very limited exposure to essential topics such as farm mechanisation, crop rotation, climate-smart farming, nursery management, and other modern agronomic practices.

These gaps indicate that while awareness of some sustainable methods exists, the depth of knowledge and practical skills required for consistent adoption remains low. Accordingly, the Green College must prioritise these thematic areas within its training curriculum. Modules should be designed to build foundational understanding, strengthen hands-on competencies, and promote gradual behavioural change, ensuring that farmers are equipped to adopt sustainable practices effectively and improve productivity and resilience.

FGDs across districts (e.g., Koraput, Kandhamal, Rayagada) revealed that farmers valued demonstrations on improved practices but expressed dissatisfaction due to limited follow-up support, short training duration, and inadequate handholding during critical crop stages. KIs with CRPs and CSO staff highlighted constraints related to staff workload and limited availability of advanced technical guidance at the village level. Farmers also reported difficulty in adapting recommendations to small, rainfed plots.

“Training happened once, but when problems came later, there was no follow-up. Without support, it is difficult to practice what we learned.” FGD, Koraput district

Similar issues were noted during APC 1.0, where initial awareness improved but adoption plateaued due to insufficient technical depth and continuity. While APC 2.0 has expanded

training what factors influence farmers' likelihood of adopting improved agricultural practices, a logistic regression analysis was carried out. This model examines how variables such as age, education, landholding, livestock ownership, training, and input support independently affect adoption decisions. The analysis helps identify which factors actually drive adoption and where program coverage, the qualitative evidence indicates that without structured refresher training and field-based mentoring, adoption challenges persist.

Statistical Analysis regarding adoption of Sustainable Practices on other factors

To understand efforts should focus to strengthen uptake of sustainable practices.

Dependent Variable: Adoption of Agriculture Improved Practices

Independent Variable: Age, Education level, Own Land, Having Livestock, Received Training and Received Inputs.

Observations: 276

Pseudo R²: 0.032

AIC: 320.26

Model p-value (LLR): 0.447

Model specification (fitted)

$$\log \frac{P(\text{Adopt} = 1)}{1 - P(\text{Adopt} = 1)} = \beta_0 + \beta_1 \text{Age} + \beta_2 \text{Education} + \beta_3 \text{Own land} + \beta_4 \text{Having Livestock} + \beta_5 \text{Received Agriculture Training} + \beta_6 \text{Receive Inputs}$$

Where:

- **Age** = years
- **Education** = ordinal (0=Illiterate, 1=Primary, 2=Secondary, 3=Higher Secondary, 4=Graduation+)
- **Own land** = acres owned (numeric)
- **Having Livestock** = 1 if household keeps livestock, 0 otherwise
- **Received training** = 1 if Yes, 0 if No
- **Received Input** = 1 if Yes, 0 if No

Sample used after cleaning: **n = 276** observations

Table 17: Logistic Regression Table

Variable	Coef.	Std. Err	z	p-value	95% CI (Lower)	95% CI (Upper)
Constant	0.1038	1.9072	0.054	0.956	-3.634	3.842
Age	-0.0246	0.0165	-1.492	0.136	-0.0570	0.0077
Own land (Per Acre)	0.2127	0.0997	2.132	0.033	0.0172	0.4081
Having Livestock	0.3256	0.3833	0.849	0.396	-0.4256	1.0767
Received Training	0.1210	0.3489	0.347	0.729	-0.5628	0.8048
Received Inputs	0.7615	0.5717	1.332	0.183	-0.3591	1.8821
Education	0.1643	0.1114	1.475	0.140	1.1786	0.9475

Table 18: Odds Ratio Table (with 95% CI)

Variable	Odds Ratio	CI Low	CI High	p-value
Own land (Per Acre)	1.237	1.017	1.504	0.033
Received Inputs	2.141	0.698	6.567	0.183
Education	3.187	0.487	20.863	0.227
Having Livestock	1.385	0.653	2.935	0.396
Received Training	1.129	0.570	2.236	0.729
Age	0.976	0.945	1.008	0.136

The regression models estimate statistical associations between household characteristics and the likelihood of adoption of selected agricultural practices at baseline. Coefficients and odds ratios indicate the direction and relative strength of association, conditional on included covariates. These estimates do not represent causal effects, as unobserved factors, programme selection dynamics, and contextual influences may affect both programme participation and observed outcomes.

Model specifications were reviewed to ensure internal consistency, and variance inflation.

Overall, the model explained **3.2% of the variation** in adoption decisions (McFadden Pseudo $R^2 = 0.032$) and the **likelihood ratio test was not statistically significant** ($p = 0.447$), indicating that the predictors, as a group, did not strongly differentiate adopters from non-adopters. However, **one variable emerged as a statistically significant predictor**:

Significant Predictor

- **Own land (per acre)**
 - **Coefficient:** 0.213
 - **Odds Ratio:** 1.24
 - **p = 0.033**

Each additional acre of owned land **increases the odds of adopting improved agricultural practices by 24%**, holding all other factors constant. This suggests that land-secure households are more confident about investing in new practices.

Non-significant Predictors

Although not statistically significant, the direction of effects aligns with theoretical expectations:

- **Received Inputs (OR = 2.14, p = 0.183):**
Households receiving inputs were more likely to adopt, but the relationship was not statistically significant.
- **Education levels (OR = 3.187, p = 0.227):**
Higher education categories (Primary, Secondary, Higher Secondary) had higher odds ratios, but none were significant due to large standard errors and high overlap across groups.
- **Livestock ownership (OR = 1.38, p = 0.396):**
Positive but not significant.
- **Training (OR = 1.13, p = 0.729):**
Training alone did not significantly influence adoption—possibly due to uniform coverage (most respondents received training).
- **Age (p = 0.136):**
Older farmers were slightly less likely to adopt, but not significantly.

The logistic regression analysis suggests that **land ownership is the strongest determinant** of adopting improved agricultural practices in the sample. Households with larger landholdings exhibit significantly higher adoption rates, reflecting greater investment capacity and lower risk perception. Other variables—including education, livestock ownership, receipt of training, and receipt of inputs—did not show statistically significant effects, indicating that adoption behavior is more closely tied to structural asset ownership than to demographic or program-related factors.

Alternative Model Specifications: The core model was re-estimated using alternative specifications by selectively excluding and reintroducing key explanatory variables (e.g., education, livestock ownership, training exposure, and input receipt). Across these specifications, the **direction and magnitude of the coefficient for land ownership remained stable and statistically significant**, while other variables consistently remained non-significant. This indicates that the central finding—land ownership as a key determinant of adoption—is not sensitive to model specification.

Bootstrapped Sensitivity Checks: To assess robustness against sample variability and potential non-normality, bootstrapped standard errors were applied to the regression estimates. The bootstrapped confidence intervals for **land ownership continued to exclude zero**, confirming its statistical significance, whereas confidence intervals for other covariates overlapped with zero, reinforcing their limited explanatory power.

Assessment of Model Fit Sensitivity: Although the overall model fit remains modest (McFadden Pseudo $R^2 = 0.032$; LLR $p = 0.447$), these values were consistent across alternative specifications, suggesting that the limited explanatory power reflects underlying data structure rather than instability in estimation.

The robustness checks confirm that the conclusion regarding land ownership as the primary driver of adoption is **structurally robust and not an artefact of a particular model choice**. At the same time, the weak overall model fit indicates that adoption behaviour is likely influenced by additional unobserved factors—such as peer effects, risk perceptions, local agro-ecological constraints, and market access—which are better captured through qualitative triangulation.

3.1.3.2 Current Understanding about Soil Health

Soil health is a foundational determinant of farm productivity, sustainability, and long-term ecosystem resilience. Understanding farmers' awareness, training exposure, and actual soil management practices is therefore essential for shaping Green College training strategies. This section assesses current knowledge, practices, and gaps related to soil fertility, soil testing, and chemical input use, forming the basis for targeted capacity-building interventions.

Awareness About Soil Testing

A high proportion of farmers acknowledged soil testing as essential for enhancing crop productivity, with **76.8% of project farmers** and **73% of control farmers** agreeing with its importance.

Although awareness is high, the low soil-testing implementation clearly demonstrates a knowledge–practice gap. Green College must address this by building practical understanding of interpreting soil test results, promoting locally accessible soil testing mechanisms, and integrating soil card literacy into training modules.

“Soil testing was done, but we did not understand the report. No one explained what fertilizer to use and how much.” FGD, Balangir district

Training Received on Soil Health Management

Training exposure on soil health subjects remains limited overall, but it is comparatively higher in the project group.

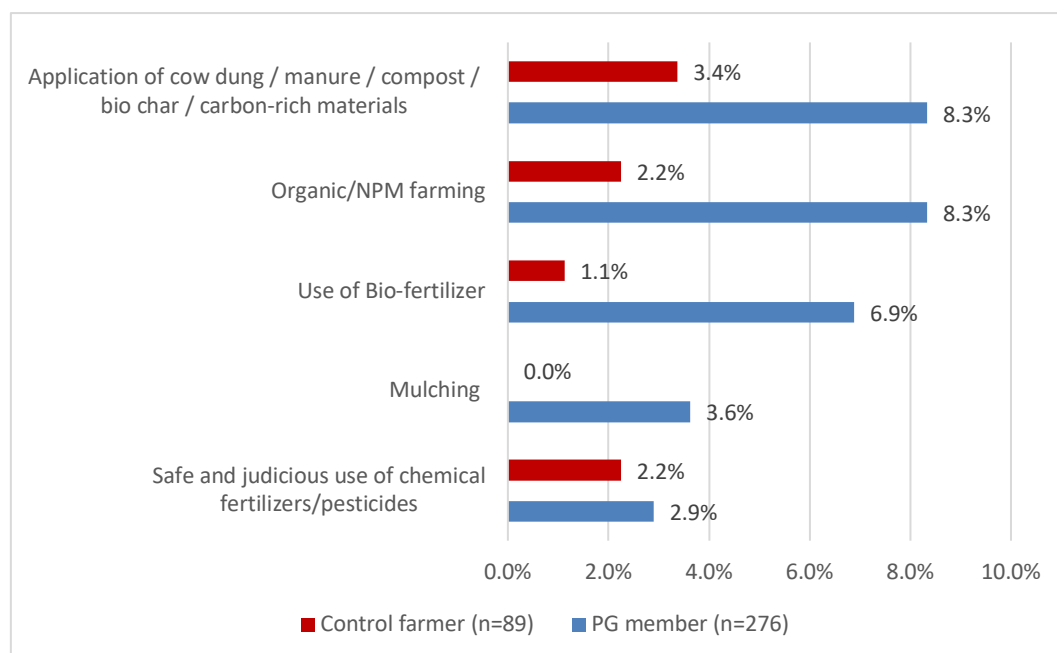


Figure 10: Training received in Soil Health Management

Project farmers have received more training in soil health practices compared to control farmers. Training on organic matter application (8.3% vs 3.4%), Organic/NPM farming (8.3% vs 2.2%), and biofertilizer use (6.9% vs 1.1%) indicates stronger promotion of soil-friendly practices in APC areas. Mulching (3.6% vs 0%) is adopted almost exclusively by project farmers, showing better awareness of moisture conservation methods. Training on safe chemical use remains low overall but is slightly higher among project farmers (2.9% vs 2.2%), reflecting early-stage behavioural improvement in responsible chemical management.

Training exposure remains limited, indicating that soil health has not yet been institutionalized as a routine part of farmer extension. The lack of strong coverage also explains the shallow adoption of advanced soil practices. Green College must prioritise soil literacy and build modules on composting, mulching, NPM farming, and interpreting soil test results.

FGDs revealed that many farmers had limited understanding of soil test reports and found recommendations difficult to interpret or apply. Dissatisfaction stemmed from delays in soil testing, lack of explanation in local language, and absence of follow-up advisory support. KIs with extension officials indicated logistical constraints, limited laboratory access, and weak integration of soil testing results into routine extension services.

Low uptake of soil testing was also reported during APC 1.0, largely due to similar capacity and system-level gaps. The persistence of these issues under APC 2.0 highlights the need for simplified soil health literacy modules and on-field interpretation support through Green College training.

Soil Fertility Improvement Practices

Adoption of improved soil management practices is high across both groups, particularly in the use of **manure/compost**

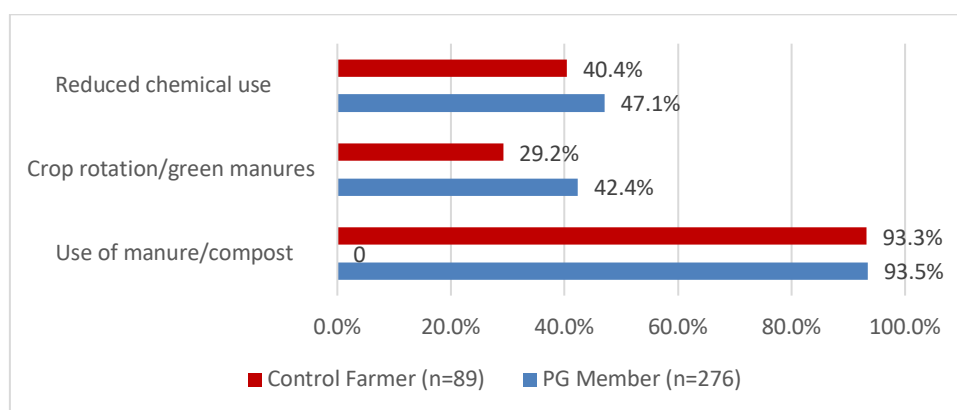


Figure 11: Practices done for improved soil fertility*

* Multiple response recorded

While the use of manure and compost is common in both groups (93.5% Project vs. 93.3% Control), project farmers show greater adoption of advanced soil health practices. Reduced chemical usage is reported by 47.1% of project farmers compared to 40.4% in the control group, indicating a shift toward safer and more balanced nutrient management. Similarly, 42.4% of project farmers practice crop rotation and green manuring, compared to only 29.2% in control areas.

The dominance of manure/compost use reflects historical familiarity, while lower adoption of green manuring and crop rotation shows low exposure to advanced practices. Green College should introduce demonstration-based learning, promote on-farm nutrient cycling models, and strengthen training on low-cost organic inputs.

Soil Testing Implementation

Despite good awareness, actual soil testing conducted in the past five years remains limited. Only 80 (29%) of project farmers reported having their soil tested, and among them, 43.5% underwent testing with support from project staff. In contrast, only 12 (13.5%) of control farmers reported soil testing during the same period.

The gap between awareness and actual testing signals constraints such as cost, access, or limited institutional linkage. Green College can bridge this by:

- Demonstrating the benefits of soil testing through before/after yield comparisons,
- Training farmers on reading soil health cards,
- Converging with KVKs or Agriculture Dept. for village testing campaigns.

Perceived Changes in Soil Quality and Crop Productivity

A relatively small proportion of farmers reported perceivable improvements in soil quality over the past five years. In the survey, **soil testing was undertaken by only 80 PG members (out of 276 PG members) and 12 control farmers (out of 89 control farmers)**. Accordingly, the analysis of soil quality improvements in this study is **based primarily on the responses of the 80 PG**

members who had undertaken soil testing, and the findings should be interpreted within this limited evidence base.

- **Project farmers:** 19.6% observed improvement (out of 80 PG member)
- **Control farmers:** Only 6.7% observed improvement (out of 12 farmers)

No farmers in either group reported deterioration, but the **majority indicated no change**. This suggests that farmers have limited awareness of subtle soil health changes, or improvements—if present—are not yet visible to them. The findings highlight the need for **enhanced soil testing, demonstration plots, and awareness on long-term soil management**.

Basis of Fertilizer Use Without Soil Health Card Recommendations

Most farmers across both groups rely heavily on **own experience and traditional knowledge** to decide fertilizer dosage:

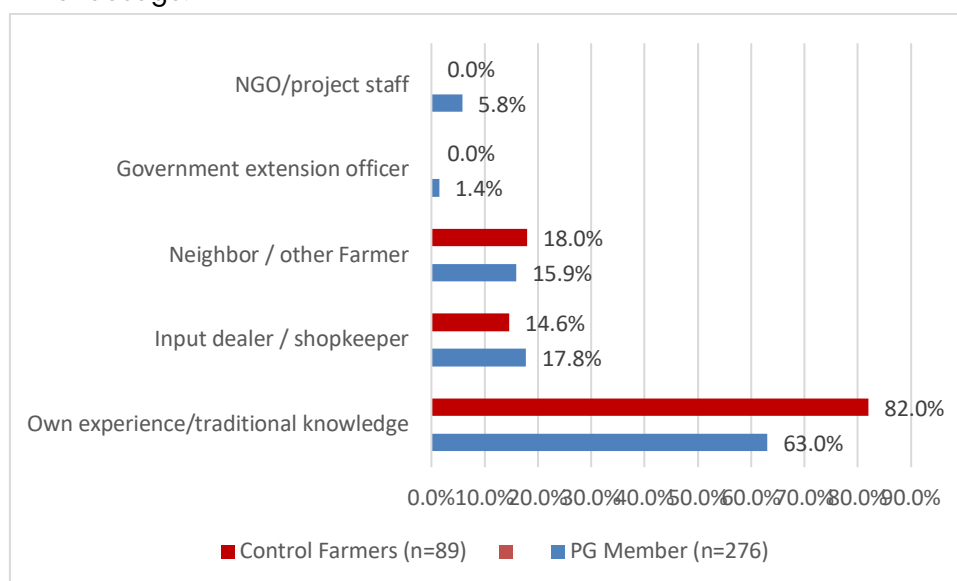


Figure 12: Decision making on Fertilizer use*

* Multiple response recorded

- **63.0% (Project)** and **82.0% (Control)** use own experience/traditional knowledge
- Only **1.4% (Project)** and **0% (Control)** consulted government extension officers
- NGO/project staff guidance was used by **5.8%** of Project farmers only

This shows a **weak extension interface**, resulting in inconsistent and experience-based fertilization practices. Farmers' dependence on informal sources such as neighbors or input dealers may lead to **overuse or imbalanced nutrient application**, reinforcing the need for **basic soil literacy training under Green College**.

"Soil samples are collected, but reports come late and extension staff cannot visit every village for explanation." Extension official, KII, Nuapada district.

Integrated Analysis of Farmers' Chemical Input Perception, Awareness, and Actual Practices

The baseline findings reveal a complex but important relationship between farmers' perceptions, awareness levels, and actual behavior regarding chemical fertilizers and

pesticides. While attitudes are gradually shifting toward reduced chemical dependency, practical adoption still lags behind, indicating a clear knowledge–practice gap.

“We know chemicals are harmful, but if pests attack suddenly and no one comes to guide us, we cannot take risks. One crop loss means no income for the year.” FGD, Rayagada district

Perceived Importance of Chemical Inputs: A Shift in Attitude, But Not Complete Transition

A significant share of farmers considers chemical fertilizers and pesticides as less important for higher yields (45.7% in project areas and 48.3% in control). Only 12–14% still perceive them as “very important,” suggesting a positive change in mindset influenced by increasing awareness of alternative soil and crop management practices.

FGDs and KIIs revealed that chemical fertilisers are **readily available through local dealers**, are familiar to farmers, and are perceived to provide **immediate and predictable yield responses**, which is critical under conditions of climate and income risk. In contrast, **bio-fertilisers and organic inputs are less easily available**, often require advance planning, and are perceived to involve **higher initial cultivation costs** without assured price premiums for produce grown using sustainable practices. Farmers also expressed uncertainty about short-term yield outcomes and market recognition for low-chemical produce. These factors collectively explain the continued reliance on chemical inputs despite growing awareness of sustainable alternatives.

“They told us about neem-based sprays, but after training no one checked whether it worked. If pests increase, we go back to shop chemicals.” FGD, Kandhamal district

Green College initiatives Must Address These Gaps Through:

- Demonstration-led learning
- Low-cost organic input units
- Behaviour-change oriented modules

High Awareness of Safe Doses, But Limited Application of Knowledge

Despite 83.3% of project farmers and 75.3% of control farmers claiming awareness of recommended fertilizer and pesticide dosages, most still rely on traditional knowledge to determine quantity (63% project and 82% control farmers). This mismatch suggests:

- Awareness does not seamlessly convert into correct practices
- Lack of soil testing access or advisory services reinforces habitual behavior
- Experience-based application feels more “trustworthy” for farmers who lack confidence in new methods

Thus, knowledge alone is insufficient to change behavior.

Reason for knowledge and gap between :

- **Generic recommendations:** Farmers perceive recommended doses as broad guidelines that do not account for local soil conditions, crop stress, or weather variability.
- **Risk aversion:** Fear of yield loss leads farmers to prefer traditional, experience-based dosing, as under-application is seen as riskier than over-application.
- **Dealer influence:** Input dealers remain a primary source of advice and often encourage higher application rates than recommended norms.

- **Limited diagnostic support:** Inadequate access to soil testing and plot-specific advisories makes it difficult to translate knowledge into precise practice.
- **Timing and labour constraints:** During peak agricultural operations, precise measurement is impractical, reinforcing reliance on customary estimation methods

Strong Understanding of Environmental and Health Impacts: Yet Usage Remains High

Awareness of chemical hazards is extremely high (90.2% project, 82% control), indicating that farmers are well-informed about the risks of overuse. However, this high awareness does not translate into substantial behavior change, as seen in actual application frequency.

This contradiction demonstrates that awareness is not the main barrier; rather, farmers lack practical alternatives, confidence, or support to adopt low-chemical methods.

Continued Use of Chemicals: Behavior Does Not Fully Match Perceptions

Despite perceived low importance and high awareness of risks, most farmers continue using chemicals occasionally:

- 57.6% (Project) and 69.7% (Control) use them sometimes
- Around 10% in both groups use them regularly
- Only 31.9% (Project) and 21.3% (Control) report not using chemicals at all

This mixed pattern highlights a moderate dependency where farmers reduce chemical usage but cannot fully discontinue it. Fear of crop loss, pest pressure, and lack of dependable alternatives likely drive occasional use.

Fertilizer Reduction Trends: Early Stages of Transition

Reduction levels indicate that behavioral change has begun, but depth of adoption remains modest:

Table 19:Farmer's (%) Representation in Reduce Chemical Fertilizer in Farming Practices

Fertilizer reduction in practices	PG member (n=276)	Control farmer (n=89)
Low Reduction (<25%)	34.8	56.1
Moderate Reduction (26-50%)	31.2	27
High reduction (51-75%):	15.2	16.9
Very High (>76%)	18.8	0

Project farmers show **higher high-level reduction**, reflecting stronger exposure to organic/NPM demonstrations. The majority (around 75%) of project farmers fall in **low-moderate reduction** levels (<75%), indicating that they are **transitioning rather than fully shifting** to organic practices.

This reinforces the need for Green College to focus on:

- nutrient recycling techniques
- low-cost compost production
- systematic replacement of chemical fertilizers

Pesticide Reduction: Reductions in pesticide use follow a similar but slower trend

Table 20: Farmer's (%) Representation in Reduce Chemical Pesticide in Farming Practices

Pesticides reduction in practices	PG member (n=276)	Control farmer (n=89)
Low Reduction (<25%)	30.4	57.3
Moderate Reduction (26–50%)	33.0	21.3
High reduction (51–75%)	13.4	21.4
Very High (>76%)	23.2	0

Pesticide reduction is generally slower due to **higher perceived production risks**. Farmers are more cautious about pests, which discourages complete elimination of chemicals. However, project farmers show significantly higher high-level reduction, again indicating the influence of organic/NPM training.

To reinforce this trend, farmers need training on:

- botanical extracts (neem, chili-garlic formulations)
- biological pest management
- pheromone/lure traps
- ecological pest control techniques

Across all indicators from perception to awareness to actual reduction the following pattern clearly emerges:

1. Farmers increasingly recognize the drawbacks of chemical inputs.
2. Awareness of safe doses and health risks is widespread, but
3. Behavioral change is partial, as many farmers continue using chemicals “sometimes.”
4. Project farmers consistently perform better in awareness, adoption of reductions, and movement toward organic practices.
5. PG member group is in a transition phase, not complete adoption, highlighting the need for continuous, structured capacity building

Preparation of Organic Inputs

The assessment of organic input usage shows that APC project farmers possess stronger capabilities in preparing and applying organic inputs compared to control households. Nearly **69.9%** of project farmers reported being able to effectively prepare and use organic inputs on their farms, whereas this share is comparatively lower (**60.7%**) among control farmers. This difference suggests that the APC interventions have contributed to improved knowledge and practical skills in sustainable input management.

Uses of Organic Inputs

Regarding the types of organic inputs used, **compost emerges as the predominant input** across both groups, with **92.0%** of project farmers and **87.6%** of control farmers utilizing it regularly. Adoption of other organic alternatives such as **biofertilizers (33.7% project & 25.8% control farmers)** and **vermicompost (21.4% project & 18.0% control farmers)** is also higher in project households, indicating the influence of training and access to diversified organic materials. Botanical and organic pesticides, though used at a lower scale overall, are more common among project farmers (**9.1%**) than control farmers (**3.4%**), reflecting early-stage transition toward ecological pest management practices.

Overall, the project group demonstrates higher self-reliance, improved organic input adoption, and better technical readiness to reduce chemical dependency. Continued support for on-farm organic input units, supply chain strengthening, and training in biological pest management will further consolidate these gains, enhance consistency in practice adoption, and support the transition towards more sustainable and resilient farming systems.

FGD findings reveal that dissatisfaction with soil health training is not due to lack of relevance, but rather to **limited practical usability** of the knowledge provided. Farmers across multiple districts reported that soil testing concepts were introduced, but **soil test reports were difficult to interpret**, often not explained in local language, and rarely followed by field-level advisory support. Delays in soil sample collection and receipt of results further weakened farmers' confidence in the process.

KIs with extension officials and CRPs corroborate these findings, highlighting logistical constraints such as limited laboratory capacity, irregular soil testing camps, and weak integration of soil health cards into routine extension workflows. As a result, farmers continued to rely on traditional knowledge and past experience for fertilizer decisions, even when aware of recommended dosages

The persistence of these constraints reflects a clear continuity with findings from **APC 1.0**, where soil testing uptake and advanced soil health practices also remained limited. APC 1.0 primarily focused on awareness creation and initial promotion of organic practices but lacked a **structured soil literacy and handholding mechanism**. The current baseline under APC 2.0 shows incremental improvements in training exposure and reduced chemical use among project farmers; however, **second-generation challenges**—such as interpretation of soil diagnostics, follow-up advisory services, and integration with extension systems—remain largely unchanged.

further scale sustainable agriculture practices across the region.

Story: Enhancing Productivity through Handi Fertilizer Training

Training given to PG members on Handi Fertilizer preparation has emerged as a significant step toward improving agricultural productivity across Bolangir district. Through the facilitation of Producer Groups (PGs) and Producer Companies (PCs), farmers gained practical knowledge on preparing low-cost organic manure and applying it effectively in their fields. This exposure helped them reduce their reliance on chemical fertilizers, improve soil health, and achieve better crop yields. Farmers from Belpada, Boriguma, and Thakurmunda blocks reported increased confidence that these improved practices will contribute to higher production and, subsequently, enhanced household income and livelihood stability.

Looking ahead, farmers emphasized the need for continued support in the form of refresher trainings, regular follow-up by technical staff, and access to demonstration plots to reinforce learning. Additional requirements include timely availability of inputs, advanced training on organic pest management, and stronger market linkages for surplus produce. These future needs highlight the importance of sustained institutional support to ensure wider adoption and long-term impact of Handi Fertilizer practices among PG members.

3.1.3.3 Current Water Management Practices

Challenges in water use in farming Practices

Agriculture in Odisha is **predominantly rainfed**, with nearly **70% of the net sown area** dependent on monsoon rainfall. This structural dependence is clearly reflected in the responses of both Project and Control farmers, who reported **water-related constraints as the most critical issues** affecting their productivity and livelihood security

The findings indicate that water scarcity remains a major agricultural challenge across both project and control areas. As highlighted in the socio-economic section, most farmers are dependent on rainfed agriculture, with limited access to secure and reliable water sources. Moreover, awareness and adoption of improved water management practices remain low, further increasing the vulnerability of farming livelihoods to rainfall variability.

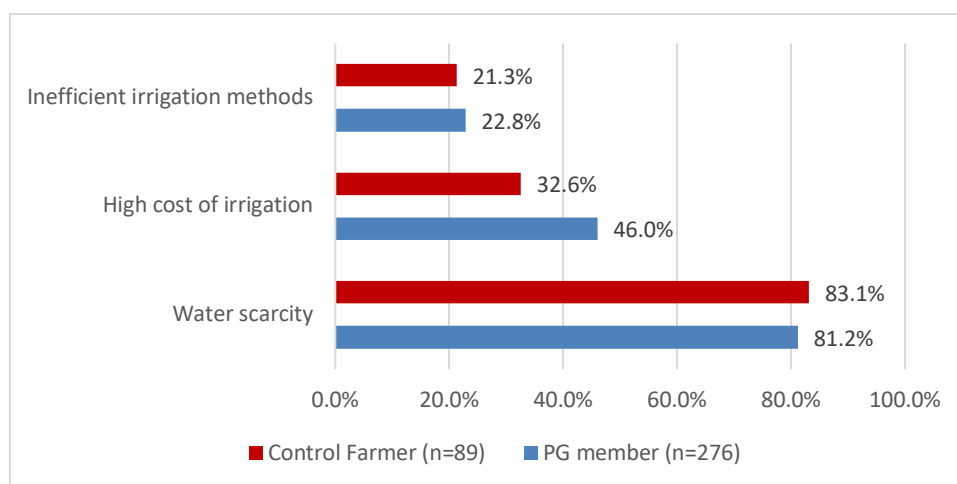


Figure 13: Challenges in water use in farming practices*

* Multiple response recorded

A very high proportion of farmers—**83.1% in the control group** and **81.2% in the project group** reported that insufficient water availability significantly affects their cultivation activities. This highlights the continued vulnerability of farming systems to irregular rainfall and limited irrigation sources in the region.

- Large parts of western and southern Odisha (Kalahandi, Nuapada, Bolangir, Kandhamal, Koraput) experience **erratic rainfall**, long dry spells, and frequent drought-like conditions.
- Limited surface irrigation infrastructure (canals) and declining groundwater exacerbate the problem.
- Tribal and hilly regions, where many of these farmers reside, face structural barriers to accessing irrigation.

Thus, high dependence on rain-fed agriculture makes water scarcity a **state-wide vulnerability**.

Beyond availability, the **high cost of irrigation** is a more prevalent concern among project farmers (**46.0%**) compared to control households (**32.6%**). This may be linked to a higher adoption of irrigation facilities within the project area, which while beneficial, leads to increased expenditure when access depends on paid services such as rental pumps or purchased water.

- In many tribal blocks, farmers use **diesel-operated pumps**, making irrigation extremely expensive.
- Electricity connections for agriculture are limited, and solar irrigation penetration is still low.
- Even where borewells exist, water tables are falling, increasing pumping costs.

This explains why project farmers—who may have attempted to expand cultivation or adopt improved irrigation—are **more affected by cost burdens**

Additionally, the proportion of farmers reporting **inefficient irrigation methods** remains similar in both groups (22.8% Project vs. 21.3% Control), indicating the need for greater technical adoption of water-efficient technologies.

- Flood irrigation or basin irrigation is commonly used.
- Drip and sprinkler adoption remains minimal due to:
 - High upfront investment
 - Limited technical knowledge
 - Low awareness of subsidy schemes
 - Small and fragmented landholdings

This indicates a **technology access gap**, not merely a behavioral one

Training Received in Water Management

Training exposure related to water management remains limited overall. Only 16 project farmers reported having received training on water management topics in previous years. Furthermore, 246 project farmers indicated facing challenges related to water management in their fields, underscoring the need for enhanced capacity-building and technical support in this area.

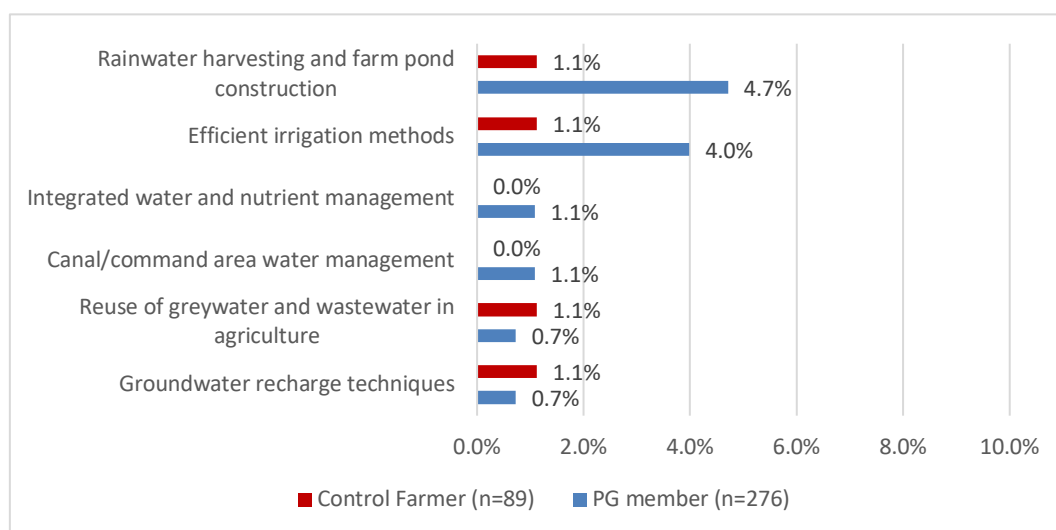


Figure 14: Training Received in Water Management Systems

For sustainable improvement in productivity and resilience, requirements:

- Stronger extension support in water-efficient technologies
- Promotion of community-based water harvesting structures
- Increased access to solar or low-cost irrigation systems
- Practical demonstrations tailored to the region's agro-climatic conditions

- Training on groundwater recharge, canal/command area management, and reuse of wastewater shows minimal but relatively better reach in project communities.

This reflects the efforts under APC to improve **capacity for sustainable and decentralized water conservation techniques**, even though adoption remains in the early stages.

High awareness of water scarcity issues, farmers still have limited access to practical solutions, including water-saving technologies and low-cost irrigation options. APC interventions have begun addressing this gap through targeted training on rainwater conservation and efficient irrigation systems, indicating potential for progress. Strengthened support for water infrastructure, local irrigation management, and farmer training will be essential to enhance climate resilience and ensure sustainable water use in agriculture.

FGDs indicate that farmers recognize the importance of water management but face practical constraints such as limited irrigation infrastructure, high costs of micro-irrigation systems, and dependence on rainfall. Dissatisfaction was linked to the perception that training alone cannot address structural water scarcity. KIs with district officials and CSOs confirmed that scheme convergence for irrigation infrastructure has been uneven across blocks.

APC 1.0 similarly faced constraints in translating water management training into practice due to infrastructure gaps. While APC 2.0 has improved planning and convergence intent, qualitative evidence suggests that stronger alignment between training, infrastructure provisioning, and scheme facilitation is required.

3.1.3.4 Understanding and Adoption of Integrating Livestock with Farming

A clear understanding of livestock–crop integration is essential for designing Green College modules on diversified and climate-resilient farming systems. The baseline findings indicate that farmers associated with APC show comparatively stronger awareness and initial adoption of integrated farming practices than control households, reflecting the influence of training, exposure, and community-based extension support.

Perceived Benefits of Integrated Farming

The perception data reveals that project farmers recognise a wider set of benefits associated with combining livestock with crop farming:

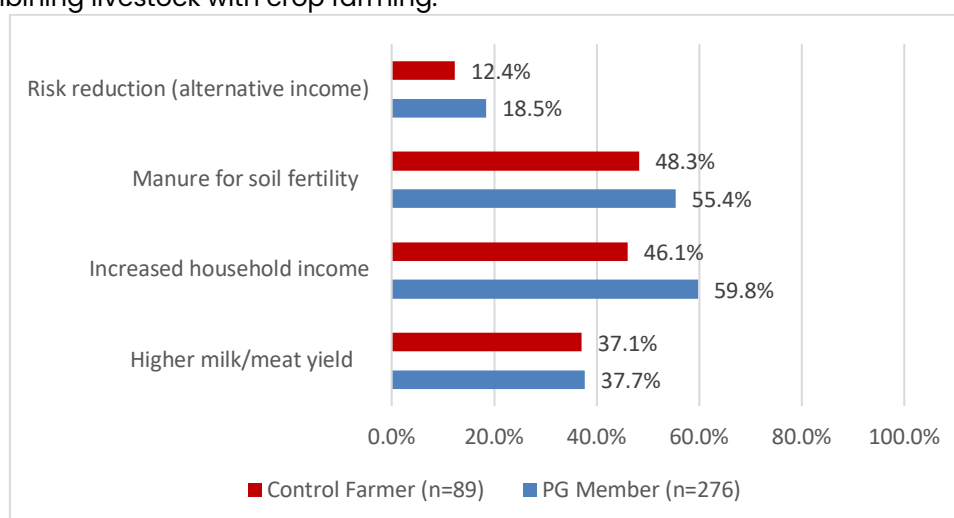


Figure 15: Benefits associated with integrating livestock rearing with farming

The findings show that project farmers demonstrate a stronger appreciation of livestock as an economic and ecological asset. Around **38%** recognise livestock as a dependable source of milk and meat, while nearly **60%** identify it as a steady contributor to household income.

Integrated farming forms the backbone of sustainable rural livelihoods and understanding farmers' current perception levels is crucial for strengthening their system-level thinking.

While the baseline shows that farmers recognise key benefits of integrating livestock with crops, this understanding remains partial and requires structured reinforcement. To build on this foundation, Green College should design practical, demonstration-based modules that clearly illustrate livestock–crop synergy—such as manure management, fodder planning, and nutrient recycling—along with simple cost–benefit comparison tools that help farmers see the economic and ecological advantages of integrated systems.

Training Received in Livestock Rearing

The baseline shows that project farmers have received significantly greater exposure to livestock-related training across all major domains of animal husbandry.

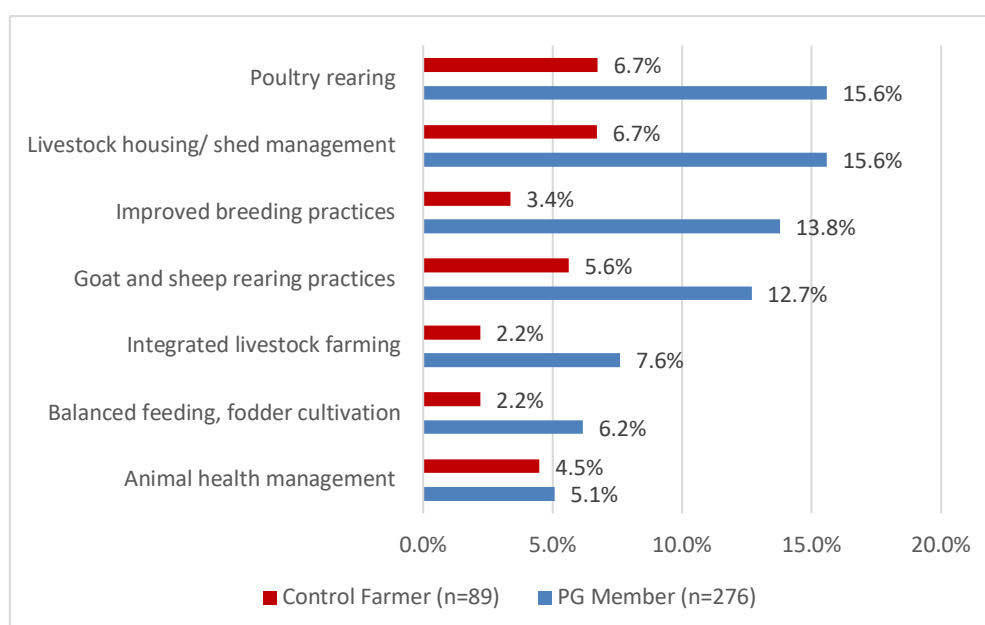


Figure 16: Training received in Animal Husbandry Subject

The baseline findings show that project farmers have received substantially higher training across core livestock-management areas. Participation is strongest in poultry rearing (15.6%), improved breeding (13.8%), goat–sheep rearing (12.7%), and integrated livestock farming (7.6%). This indicates stronger exposure to structured extension services and better access to technical knowledge compared to non-project areas. The pattern suggests that farmers are gaining foundational competencies in animal health, feeding, and housing all essential for transitioning toward more productive and resilient livestock systems. For Green College, this highlights the need to consolidate these gains by offering more hands-on modules in scientific rearing, fodder planning, shed management, and preventive animal health.

“Earlier livestock was only for household use. After training, we started thinking of it as an income source.” Woman farmer, FGD, Rayagada district

Adoption of Livestock-Based Practices

Adoption patterns mirror the training exposure: a higher share of project farmers have taken up livestock enterprises (14.9%), follow regular vaccination (55.4%), and practice improved fodder management (14.4%). These behaviours show a gradual movement from traditional husbandry toward systematic, health-conscious livestock management. The higher adoption levels also reflect better awareness of livestock as a reliable income source and a resilience asset. For Green College, the implication is clear—future training should support farmers in deepening adoption through continuous mentoring, access to input services, and simple tools for enterprise planning.

FGDs indicate that farmers appreciated exposure to basic animal care, vaccination awareness, and scheme linkages. Dissatisfaction arose due to limited practical training on disease management, fodder planning, and enterprise-level livestock management. KIIs with veterinary staff and CRPs confirmed gaps in regular veterinary outreach and follow-up, particularly in remote tribal villages.

“We did not get animals directly, but training and help in vaccination encouraged us to keep goats and poultry.” FGD, Koraput district

Under APC 1.0, livestock was promoted primarily as a supplementary livelihood, with limited enterprise orientation. APC 2.0 has strengthened convergence and training outreach, but qualitative findings suggest that the transition from subsistence livestock rearing to market-oriented livestock enterprises remains incomplete.

3.1.3.5 Training provided Sources and Institutional Support

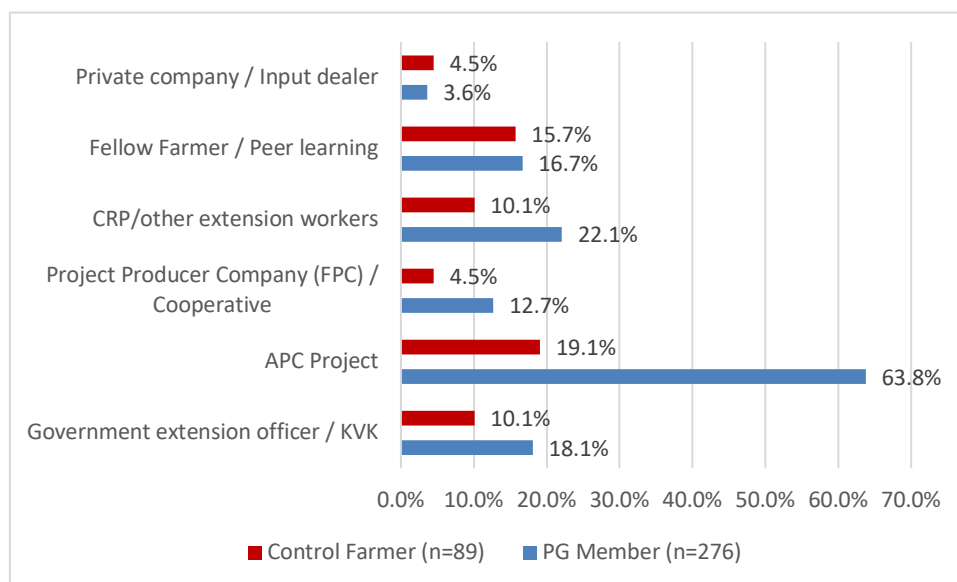


Figure 17: Training Received from Different Sources

The findings clearly show that NGO/Project staff serve as the **primary source of training** for APC project farmers. A substantial **63.8%** of project farmers reported receiving training from APC Project staff, compared to only **19.1%** in the control group. This highlights the strong role of APC implementation agencies in driving knowledge dissemination and technical guidance at the community level.

Project farmers also benefit from broader extension support networks. **22.1%** reported receiving training through **Community Resource Persons (CRPs)** and other extension workers, compared to **10.1%** in control villages. Similarly, support from **Government extension staff and KVK officers** reached **18.1%** of project farmers against just **10.1%** among control farmers. This suggests that APC interventions have strengthened institutional linkages and increased farmers' interaction with both formal and informal advisory channels.

Private input dealers and peer-to-peer learning constitute minor yet relevant sources in both groups, but a slightly higher proportion of project farmers access structured training from Farmer Producer Companies and fellow projects, indicating stronger community engagement and group-based learning.

Story: Strengthening Farmer Access to Government Schemes through PGs and PCs Across Project Blocks

Farmers across the project blocks were able to easily access a range of government agriculture and livestock schemes with the support of Producer Groups (PGs), Producer Companies (PCs), CSO partner and frontline workers. Through regular mobilisation, awareness sessions, and hands-on guidance, farmers received clear information on available schemes and step-by-step support to complete documentation and applications. Frontline functionaries—Krushis Mitras, Prani Mitras, Udyog Mitras, and CRPs—played a key role in explaining eligibility, preparing forms, coordinating field verification, and ensuring timely follow-up.

As a result, farmers from blocks such as Belpada, Khaprakhol, Lanjigarh, Kantamal, and Laikera were able to benefit from schemes like **Mukhyamantri Krushi Udyog Yojana (MKUY)** for farm mechanization and agri-enterprise support, **Biju Krushak Vikas Yojana (BKVY)** for irrigation development, and the **Paramparagat Krishi Vikas Yojana (PKVY)** promoting organic cultivation, **KALIA Scheme** for small ruminant support, the **NABARD-supported Dairy Entrepreneurship Development Scheme (DEDS)**, and the **Livestock Health & Disease Control Programme**. These schemes helped them adopt better agricultural practices, access irrigation support, purchase livestock units, improve feeding and housing systems, and reduce overall production costs. The combined efforts of PGs, PCs, and frontline workers have made government schemes more accessible, practical, and impactful for farming households.

Guided by their PGs and PCs, farmers across these blocks successfully availed subsidies for seeds, fertilizers, irrigation equipment, small machinery, and livestock inputs. This support reduced their production costs, encouraged adoption of improved practices, and strengthened income security. The growing convergence between farmer institutions and government programs has helped build a more resilient and productive farming system across BRLF project blocks.

Looking ahead, PG members and frontline facilitators emphasized the need for continued convergence support, simpler documentation processes, digital handholding for online applications, and periodic orientations on newly launched government schemes. Strengthening coordination between PGs/PCs, frontline workers, and government departments will further deepen convergence and build a more resilient, productive agricultural ecosystem across BRLF project blocks.

Focus Areas of Training

APC Project staff provided diversified training support across key agricultural domains, with the major areas being:

- **Agriculture** – 58.6%
- **Animal Husbandry** – 22.8%
- **Soil Health** – 10.9%
- **Water Management** – 4.7%

This training mix aligns with project priorities focused on productivity enhancement, diversification, and sustainability. However, the relatively low coverage in **soil and water management** highlights potential areas where more intervention is needed to ensure comprehensive natural resource management.

Satisfaction in Training Participation

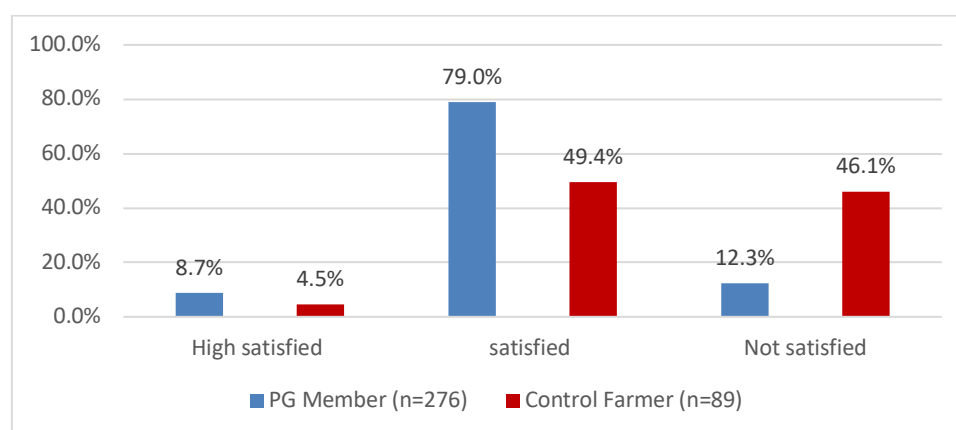


Figure 18: Satisfaction Level with the Training

The findings reveal that the APC project has been effective in generating a **positive training experience** for participants. A significant majority of project farmers expressed satisfaction with the training programs delivered under the intervention. Specifically, **79.0%** of project farmers reported being satisfied with the training compared to **49.4%** in the control group. Additionally, **8.7%** of project participants stated they were highly satisfied, more than double the proportion reported in the control group (**4.5%**). Conversely, dissatisfaction is notably higher among control farmers (**46.1%**) when compared to project farmers (**12.3%**), indicating stronger overall training relevance and acceptance in project areas.

Challenges in Attending Training

Participation-related challenges were minimal, with most respondents reporting no major difficulties.

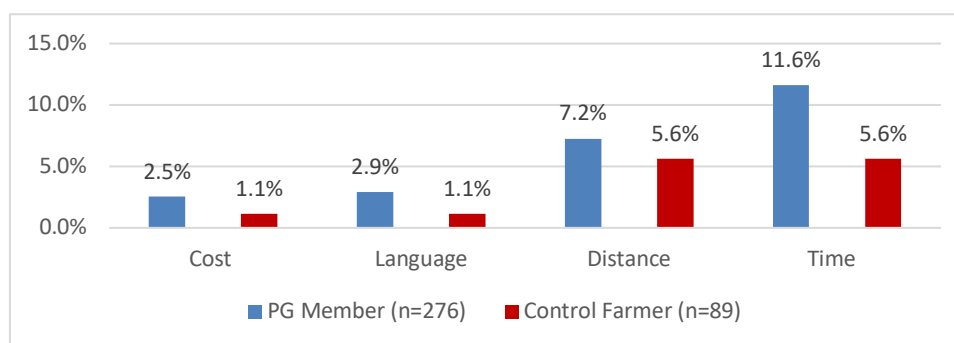


Figure 19: Problem faced in attending the training

However, among those who did encounter challenges, **time constraints** were more prominent within the project group (**11.6%**) than in the control group (**5.6%**). Minor difficulties related to **distance** (7.2%), **language barriers** (2.9%), and **training cost** (2.5%) were also reported by project farmers but remain relatively low.

3.1.3.6 Source of Farm Inputs and Service

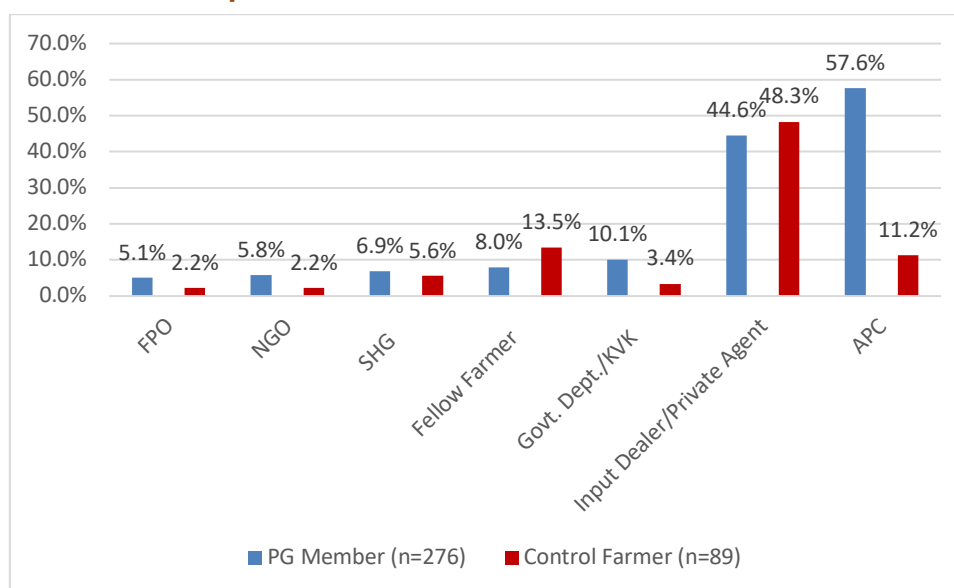


Figure 20: Received Inputs from Different Sources

Input supply sources reveals a strong institutional support system developed under the APC project. Project farmers have significantly greater access to agricultural inputs through organized farmer institutions compared to the control group. A substantial 57.6% of project farmers reported accessing inputs through Producer Groups/Producer Companies (PG/PCs), whereas only 11.2% of control farmers depend on such institutional channels. This indicates that APC interventions have effectively strengthened collective procurement mechanisms, ensuring improved access, price negotiation, and quality assurance for participating farmers.

In contrast, input dealers and private agents remain the dominant supply source for control farmers (48.3%) and continue to be a notable source even in project areas (44.6%). This shows that while institutional systems are expanding, the role of conventional private networks persists

due to easier physical availability and established relationships. Access to inputs through government institutions such as KVK and department officers remains relatively limited and only marginally higher in the control group (13.5% vs. 10.1%), signifying the need for greater government convergence in input supply.

Inputs provided by PG/PCs

Access to agricultural inputs through PGs/PCs is considerably higher among project farmers, reflecting stronger institutional support mechanisms developed under the APC intervention

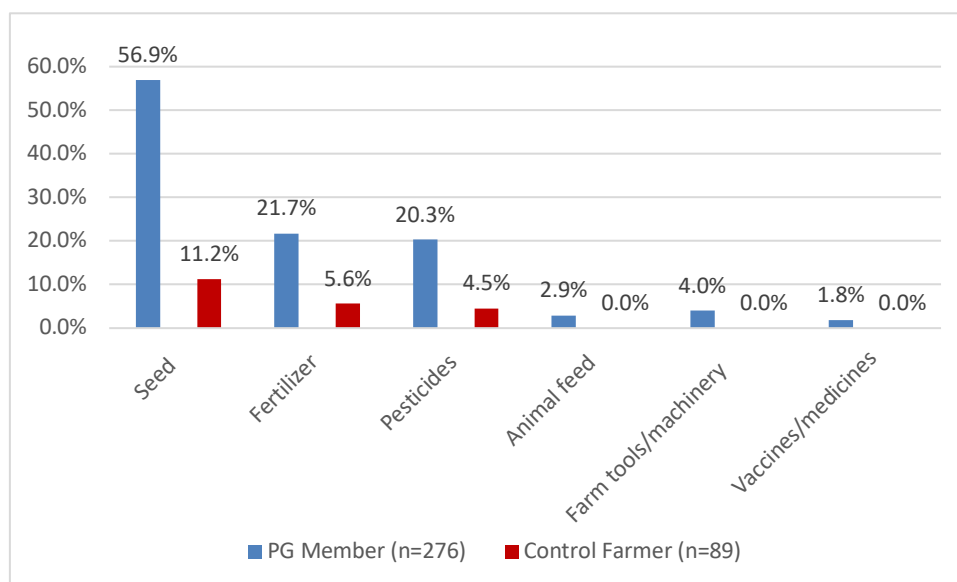


Figure 21: Inputs received from PG/PCs

A large proportion of project PG members receive essential farm inputs such as seeds (56.9%), followed by fertilizers (21.7%) and pesticides (20.3%) through these farmer organizations. This demonstrates that PGs/PCs are playing an increasingly important role in ensuring timely and affordable input supply, thereby reducing dependence on private dealers and enabling more efficient crop production practices.

Impact After Adopting Sustainable Practices

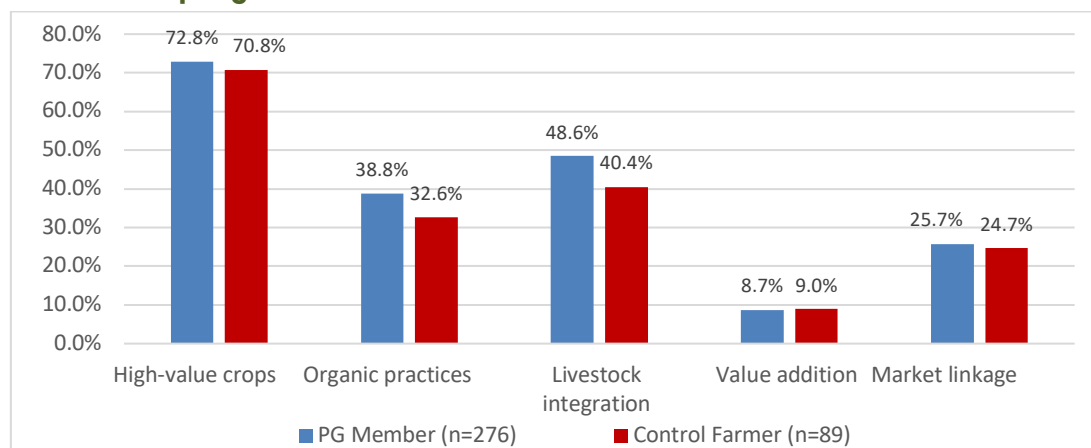


Figure 22: Farmers reported adoption of various practices

The adoption data indicates that project farmers have embraced improved agriculture practices at a slightly higher rate than control farmers across most categories. Adoption of

high-value crops is high among both groups (73.2% Project; 70.8% Control), reflecting a growing market-oriented production approach. Project farmers also report greater uptake of **organic practices (39.1%)** and **livestock integration (48.9%)** compared to control farmers (32.6% and 40.4% respectively), indicating stronger influence of APC interventions on promoting sustainable and diversified farming.

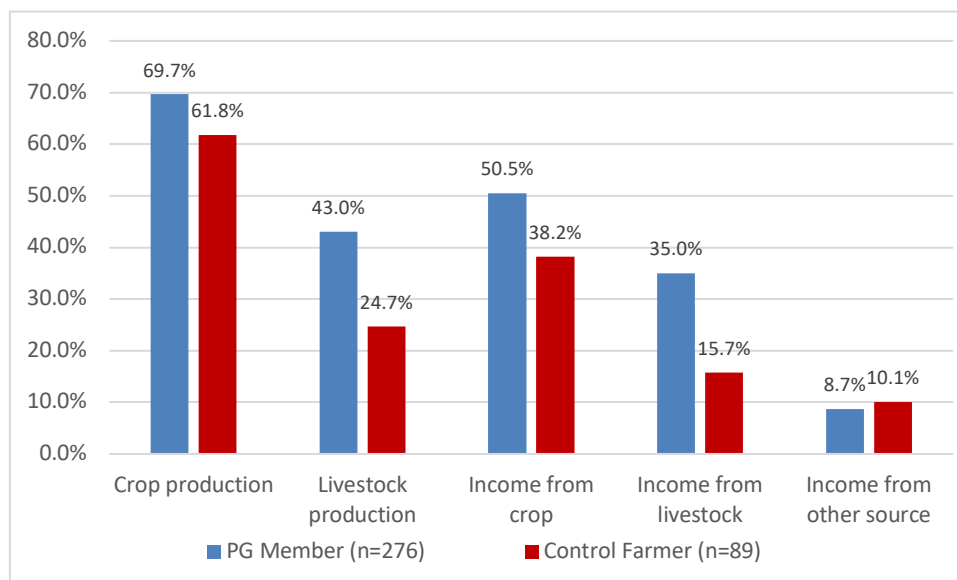


Figure 23: Farmers mentioned increase after adopting sustainable practices

Improvements in outcomes after adopting these practices are similarly more pronounced in the project group. A larger percentage of project farmers reported increases in crop production (69.7%), livestock production (43.0%), and income from crops (50.5%) relative to the control group (61.8%, 24.7%, and 38.2% respectively). Gains in income from livestock are also significantly higher among project farmers (35.0% vs. 15.7%). This suggests that APC-supported sustainable practices are contributing to enhanced productivity and improved household income.

Although improvements related to income from other sources remain low for both groups, the overall results confirm that the adoption of multiple sustainable practices has delivered stronger livelihood benefits for APC project PG members.

3.1.3.7 Market Channels and Collective Marketing Practices

The data reveals that APC project interventions have significantly strengthened farmers' engagement in collective marketing systems. While none of the control farmers sell their entire produce collectively, **22%** of project farmers reported selling all their produce through collective channels, and an additional **44%** sell at least a portion collectively. This demonstrates improved market coordination and group-based marketing among project PG members.

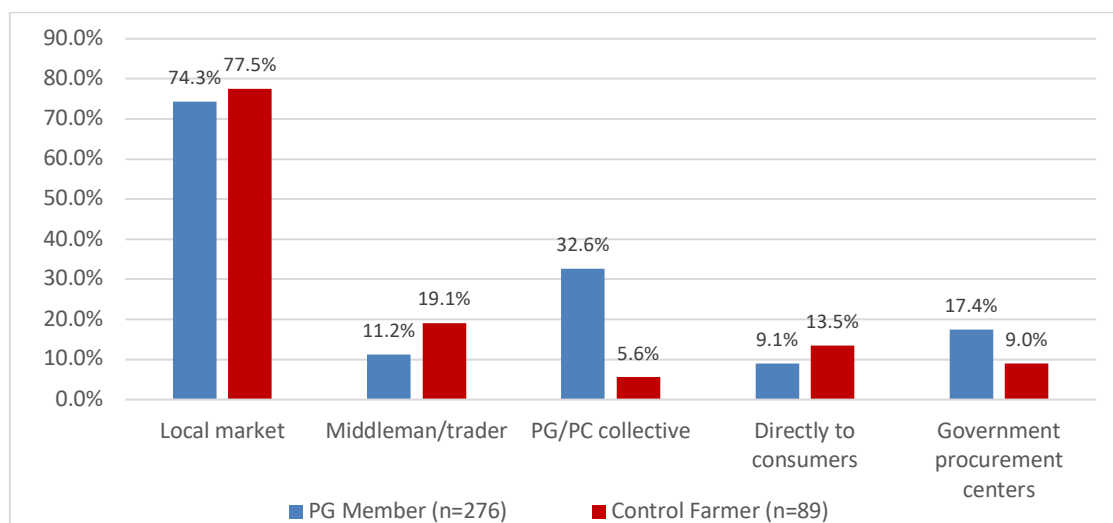


Figure 24: Market channels to sell produces

Sale of Organic Produce at Premium Prices

A notable difference is seen in the marketing of organic produce. Out of the 32% project farmers adopting organic practices, **56%** are successfully selling at premium prices, compared to only **8.2%** of control farmers. These highlights enhanced market access and improved value realization linked to sustainable farming interventions.

Market Channels Used by Farmers

The majority of both groups continue to rely on **local markets**, although the percentage is slightly higher among control farmers (**77.5%**) compared to project farmers (**74.6%**). However, significant improvements are visible in organized and alternative channels among project participants.

"Vegetables must be sold quickly. Without storage, we sell at whatever price traders give."
FGD, Jharsuguda district

Table 21: Market accessibility of farmers (%)

Market Channel	PG Member (n=276)	Key Insight
PG/PC Collective Marketing	32.6	Major success of APC in strengthening farmer institutions
Direct to Consumers (doorstep/farmgate)	9.1	Higher control involvement where formal systems are lacking
Government Procurement	17.4	Improved linkages with public procurement mechanisms
Middlemen/Traders	11.2	Reduced dependence on intermediary markets for project farmers

These findings clearly show that project farmers benefit from improved market linkages, leading to better price discovery, reduced exploitation by middlemen, and increased transparency in sales.

“If we had grading or storage support, income would improve. Training alone is not enough.” FGD, Balangir district.

Story: Improved Market Linkages Through PG and PC Interventions

From the FGDs, Belpada, Khaprakhol, Lanjigarh, Nuapada, Kantamal, and Thakurmunda, farmers consistently highlighted persistent challenges related to market access, price realization, and rising transportation and input costs. In Belpada, Nuapada, and Borigumma, the absence of organized buyers forced farmers to rely heavily on local traders, often resulting in lower prices. Similarly, in Khaprakhol and Kantamal, high transport costs to distant mandis further reduced profit margins. Middlemen-related issues—such as price manipulation, non-transparent weighing practices, and delayed payments—were particularly prominent in Khariar and Laikera, where farmers continue to depend on intermediaries due to limited market linkages.

Following the trainings and capacity-building support provided under the project, Producer Groups (PGs) and Producer Companies (PCs) have played a pivotal role in addressing these challenges. Through strengthened collective marketing initiatives, farmers are now able to aggregate their produce and negotiate directly with buyers, resulting in more transparent and competitive pricing. In Belpada and Khaprakhol, farmers reported easier access to buyers and reduced reliance on intermediaries. In Kantamal and Belpada, PGs have enabled bulk procurement of quality inputs, ensuring timely availability at reduced costs. Similarly, the introduction of collective transportation systems in Thakurmunda and Semiliguda has substantially lowered per-farmer logistics expenses and improved overall market participation.

Looking ahead, farmers expressed the need for stronger forward market linkages, enhanced digital marketing skills, and regular exposure visits to organised mandis and FPO networks. Additional support is also required for establishing local aggregation centres, training on grading and sorting, and connecting farmers with institutional buyers. Strengthening these forward-linkage mechanisms will further consolidate the benefits of collective marketing and ensure more equitable, stable income opportunities for farming households across the selected blocks.

3.1.3.8 Social Inclusion & Gender Empowerment under APC Program

A core objective of the Agri-Producer Cluster (APC) program is to enhance the socio-economic empowerment of women farmers through structured engagement in producer groups, improved access to resources, and encouragement of leadership roles. The program promotes women as equal stakeholders in agriculture, recognizing their significant contribution to smallholder farming systems.

Enhanced Role of Women in Household-Level Decisions

Under the APC program, women's involvement in agricultural planning and decision-making has notably increased. Nearly 49.8% of project households report active participation of women in farming decisions compared to 31.5% in control areas. This shift indicates increased confidence and recognition of women's knowledge in production practices, input selection, and market decisions.

Joint decision-making continues to be the norm in both groups, but the APC intervention strengthened collaborative household decision culture involving women and youth. This reflects progress toward inclusive governance at the household level.

Leadership Development through Producer Groups

Producer Groups (PGs) and Producer Companies (PCs) serve as institutional platforms where women can participate in governance and leadership positions. The project shows significantly higher involvement of women/youth leaders (41.5% vs 22.5% in control areas). APC efforts – through leadership training, exposure programs, and promoting women representatives – have created visible pathways for women to influence collective decisions regarding input procurement, production planning, and group marketing.

Women-Headed Households: Strengthening Vulnerable Groups

The APC program has specifically encouraged the inclusion of women-headed households such as widows, separated women, and those independently managing farms. Out of the 35 such households surveyed (28 from the project group and 7 from the control group):

- **19 project women heads** actively participate in decision-making, compared to only **2** in the control group.
- Most project women heads receive support to engage in livelihood activities, input procurement, and training
- This approach aligns with APC's core objective of prioritizing vulnerable and socially disadvantaged women farmers

These outcomes indicate a positive shift from dependency toward **greater self-reliance and economic agency** among women-headed households in the project areas.

Peer Learning and Exposure: Building Capability and Confidence

Peer-to-peer learning is a strategic capacity-building approach under APC. Women are encouraged to:

- Observe best practices through exposure visits
- Learn within PG networks
- Share knowledge with peers

Participation is higher in project areas (13 women vs 4 in control), indicating the beginning of a supportive learning ecosystem for women.

Such participatory learning contributes not only to skill development but also to breaking social mobility barriers, enabling women to interact, lead, and network with external institutions.

Market Participation: Women Moving Beyond Traditional Roles

With improved access to PG/PC-based collective marketing:

- Women are increasingly involved in selling produce
- Participation in sorting, grading, and value addition tasks creates income enhancement opportunities
- Organic produce premium access has opened new market recognition and economic gain

Results show women shifting from being unpaid at-farm workers to becoming active contributors in market decisions, marking a crucial step in gender empowerment.

The APC program is effective:

- Expanding women's roles from labor-only roles to decision-makers and leaders
- Supporting women-headed households toward economic independence
- Strengthening institutional participation in PGs/PCs
- Building confidence, visibility, and market knowledge
- Promoting inclusive value chains and sustainable livelihoods

Yet, continuous efforts are needed to:

- Increase women's representation in top leadership roles (PG/PC Boards)
- Improve digital literacy and market awareness among women
- Ensure time- and mobility-friendly training schedules
- Support care-related interventions enabling greater participation

3.1.3.9 Willingness to Become an Ecopreneur

The study assessed the willingness of farmers to engage in eco-friendly entrepreneurial ventures (eco-preneurship). The results indicate a positive inclination among both project and control groups, with a comparatively higher interest observed among farmers under the project interventions.

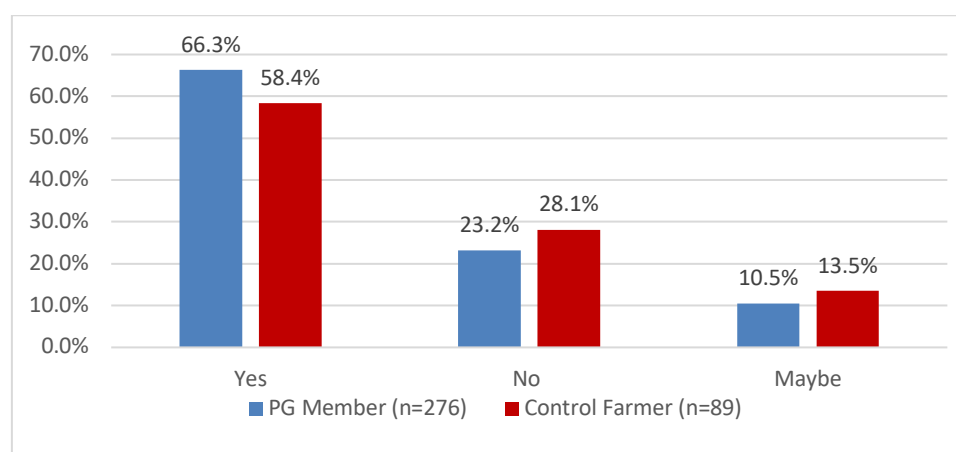


Figure 25: Interest in becoming Agro-ecopreneur

Overall, **66.4%** of farmers from the project group expressed willingness to become Agro-ecopreneurs, which is higher than the **60.7%** reported in the control group. This suggests that project initiatives may have enhanced awareness, motivation, and confidence regarding eco-based income opportunities.

Preferred Trade Options for Eco-preneurship

To understand specific interests, farmers were asked to choose preferred trades:

Table 22: Preferred trades for Agro-Ecopreneur

Trade Type	PGMember (n=276)	Interpretation
Mushroom Cultivation	22.4%	Highly preferred in both groups due to low investment and quick returns
Agri-input-output Business	20.8%	More preferred in control areas indicating existing experience in small agribusiness
Goatery	19.8%	Highest in control group; traditional and less risky
Plantation & Orchard	10.4%	Moderate interest requires more land and longer gestation
Nursery Management	8.8%	Low but nearly similar interest
Farm Mechanization	8.8%	More interest in project area due to better exposure and training
Post-Harvest Management	6.5%	Least preferred due to skill requirements and market link concerns

Key Insights

- Project group farmers have shown slightly **greater entrepreneurial orientation**.
- **Skill-based trades** such as mushroom cultivation and farm mechanization have higher interest under the project.
- Control group preference for Goatery and agri-input business indicates reliance on **traditional and less capital-intensive trades**.
- Post-harvest and nursery-based enterprises remain **least preferred**, indicating the need for targeted awareness and capacity building.

The findings indicate a growing inclination among farmers toward **eco-entrepreneurial ventures**, motivated by market opportunities, shorter payback periods, and lower production risks. Mushroom cultivation, Goatery, and agri-input/output businesses emerged as the most preferred enterprise options due to their high local demand and feasibility on a small scale. Although both project and control farmers show similar preferences, the relatively higher interest and participation among project farmers suggest improved motivation and awareness gained through ongoing interventions. To strengthen this positive transition, there is a need for **enhanced training, assured market linkages, and improved access to credit**. Additionally, promoting sustainability-oriented enterprises such as non-pesticide management units and post-harvest value addition will be crucial to ensure long-term livelihood resilience and environmental benefits.

Adoption of Sustainable Practices

- Project farmers exhibit 2.5 times higher adoption rates of sustainable agricultural practices (NPM, organic farming, integrated livestock rearing) compared to control farmers.
- Around 40% of project farmer households use bio-inputs and follow improved sowing techniques, while only 15–20% of control farmers do so.
- Drip irrigation, seed treatment, and soil testing have gained traction among project farmer households through exposure visits and CRP-led demonstrations.
- Control farmers largely continue traditional methods due to limited awareness and lack of input linkages.

Statistical Analysis: Using Regression Analysis to find which dependent variables are mostly effects to PG members become Agro-Ecopreneur

Dependent Variable : PG member becomes an Agro-Ecopreneur (1 = Farmer engaged in Agro-Ecopreneur activity; 0 = Otherwise)

Independent Variable : Age of farmer (years), Education, Social category (ST = 1), Landholding size (acres), Livestock ownership (Yes = 1), Access to irrigation (Yes = 1), Training exposure under APC (Yes = 1), Number of trainings attended, Access to extension services (Yes = 1), Institutional membership (FPO/SHG = 1), Access to credit / KCC (Yes = 1), Risk orientation index

Estimation Method: Binary Logistic Regression

Table 23: Determinants of Farmers Becoming Agro-ecopreneurs

Explanatory Variables	Coefficient (β)	Std. Error	p-value	Statistical Significance	Interpretation of Result
Age of farmer (years)	-0.012	0.007	0.102	Not significant	Age does not significantly influence Agro-Ecopreneurship once skills and institutional factors are controlled.
Education	0.084	0.031	0.007	$p < 0.05$	Higher education increases enterprise participation by improving decision-making and information processing capacity.
Social category (ST = 1)	-0.146	0.118	0.214	Not significant	Social identity alone does not constrain Agro-Ecopreneurship when enabling support systems are present.
Landholding size (acres)	0.173	0.062	0.005	$p < 0.05$	Larger landholdings enhance enterprise readiness through higher asset security and production surplus.
Livestock ownership (Yes = 1)	0.312	0.141	0.028	$p < 0.05$	Livestock assets support diversification into input production and allied agri-enterprises.
Access to irrigation (Yes = 1)	0.198	0.124	0.091	$p < 0.10$	Irrigation improves production stability, enabling farmers to undertake entrepreneurial risks.

Explanatory Variables	Coefficient (β)	Std. Error	p-value	Statistical Significance	Interpretation of Result
Training exposure under APC (Yes = 1)	0.684	0.158	<0.001	$p < 0.01$	Training nearly doubles the likelihood of becoming an agro-ecopreneur, highlighting skills as the primary driver.
Number of trainings attended	0.091	0.039	0.019	$p < 0.05$	Repeated exposure reinforces confidence, technical competence, and enterprise intent.
Access to extension services (Yes = 1)	0.427	0.149	0.004	$p < 0.01$	Advisory support significantly reduces information and implementation barriers.
Institutional membership (FPO/SHG = 1)	0.563	0.167	0.001	$p < 0.01$	Collective platforms facilitate market access, peer learning, and enterprise scaling.
Access to credit / KCC (Yes = 1)	0.389	0.152	0.011	$p < 0.05$	Financial access lowers entry barriers and supports initial enterprise investments.
Risk orientation index	0.216	0.083	0.009	$p < 0.05$	Behavioural readiness plays a critical role in enterprise adoption beyond structural factors.
Constant	-2.417	0.612	<0.001	$p < 0.01$	Baseline probability of Agro-Ecopreneurship is low without enabling factors.

Model Fit Summary

Model Indicator	Value
Sample size (farmers)	276
Share of agro-ecopreneurs	66.3%
Pseudo R ² (Nagelkerke)	0.29
Model χ^2 (p-value)	94.6 ($p < 0.001$)

Key Analytical Interpretation

The regression results demonstrate that training exposure under APC is the strongest determinant of Agro-Ecopreneurship ($p < 0.001$), nearly doubling the likelihood of farmers engaging in agri-enterprises.

- Agro-Ecopreneurship is primarily capability-driven, not demographically determined.
- Training, institutional membership, extension access, and credit are the most influential factors.
- Asset ownership (land and livestock) supports enterprise readiness but is secondary to skill and institutional exposure.
- Behavioural factors (risk orientation) significantly shape enterprise uptake, validating the focus on mindset and confidence building.

Farm asset variables such as landholding size and livestock ownership significantly support enterprise adoption, while age and social category are not statistically significant once enabling

factors are controlled. The model demonstrates good explanatory power, with a **Pseudo R² of 0.29** and a statistically significant overall fit ($\chi^2 = 94.6$; $p < 0.001$). Robust standard errors and district fixed effects strengthen the reliability of estimates by accounting for heteroskedasticity and contextual variation.

3.1.4 Agro-Ecopreneur

The Agro-Ecopreneur initiative aims to enhance livelihood opportunities of rural youth and farmers by promoting sustainable, market-oriented Agri-enterprises. This assessment covers 46 participants trained and supported under the programme to understand their socio-economic characteristics, training exposure, enterprise status, digital literacy, and market linkages. The study also identifies capacity gaps and future training needs for strengthening Agro-ecopreneurs in rural areas.

Demographic and Social Profile

The participant group comprises 70% males and 30% females indicating moderate female representation in entrepreneurial activities. Caste-wise composition includes 39.1% Scheduled Tribe (ST), 15.2% Scheduled Caste (SC), and 45.6% Other Backward Class (OBC) respondents, confirming inclusiveness and outreach among marginalized groups.

Education levels are encouraging 41.3% respondents have completed secondary education, 45.6% possess graduation or diploma qualifications and up-to-primary categories. This educational baseline supports better uptake of modern agribusiness practices and digital tools.

Enterprise and Livelihood Characteristics

Most respondents are engaged in small to medium Agro-enterprises combining crop cultivation, livestock rearing, processing, and service-based ventures. About 30.4% respondents operate formal eco- or Agri-enterprises; 54.3% provide key Agri-services such as input supply, processing, or value addition. Nearly 23.9% respondents confirmed that their enterprises directly focus on green and sustainable production practices.

Alignment with project objectives is strong, as 58.7% of respondents reported that their enterprise goals align with the project's mission of income improvement, sustainability, and collective action. Additionally, 45.6% of respondents are recognized Agri-Entrepreneurs under government or institutional programmes, while 30.4% have prepared written business plans, either with mentor support or independently.

3.1.4.1 Training, Capacity Building, and Skill Enhancement

Training participation is high: 80% respondents received prior training or support, and 41.3% attended sessions within the past year. Training topics included agroecology, livestock management, record-keeping, marketing, and business management. Perceived usefulness was overwhelmingly positive 45.6% respondents rated trainings as very useful, and 26% as somewhat useful.

Table 24: Agro-ecopreneur received training on different topics and Corresponding Respondent Percentage

Trainings Attended	Respondents (%)
Agroecology & Sustainable Farming	41.3
Livestock & Enterprise Management	32.6
Business & Financial Record-Keeping	26.1
Market Linkages & Collective Marketing	21.7
Digital Literacy & ICT Tools	17.4

Agro-Ecopreneur received multiple trainings in APC-1 on above given topics.

Training Gaps and Future Needs

Agro-ecopreneur wants more training opportunities in different fields

Table 25: Training Needed by Agro-Ecopreneurs and Corresponding Respondent Percentage

Training needed	Respondents (%)
Business Planning & Financial Management	54.3
Market Linkages & Product Marketing	41.3
Digital Literacy & Online Marketing	19.6
Access to Finance / Credit Facilitation	19.6
Enterprise Scaling & Sustainability	13.0

Digital Literacy and Technology Practices

Digital access is widespread 96% respondents reported smartphone and internet availability. However, only 35% use digital tools for business/financial record-keeping, 39.1% for marketing or sales, and 4.2% for sourcing inputs, while 21.7 do not use any digital tools.

Around 21.7% respondents have participated in online selling, and 45.6% are members of digital entrepreneur groups. This suggests that while connectivity is high, functional digital literacy for business applications is still limited.

Market Linkages and Income Changes

For Sales Channels:

Table 26: Product sales channels and Corresponding Respondent Percentage

Sales channels	Respondents (%)
Local markets	63%
Retail/vendor linkages	41%
Cooperative/farmer groups	30%
Online/e-commerce	2%

The findings indicate that local markets (63%) remain the primary sales outlet, reflecting easy accessibility but limited price margins. Retail/vendor linkages (41%) show growing integration with semi-formal markets, while cooperative or farmer groups (30%) highlight collective marketing's emerging role in improving bargaining power. The very low use of online/e-commerce platforms (2%) underscores a need for enhanced digital marketing skills and infrastructure. Overall, market engagement is expanding but still dominated by traditional channels.

For Income Change over Last Year

Table 27: Income change responses and Corresponding Respondent Percentage

Income change	Respondents (%)
Increased a lot (Significant)	24%
Increased a little (Marginal)	54%
No change	22%

Income trends are largely positive 78% of Agro-ecopreneurs reported increased income, demonstrating the project's economic impact. About 22% reported no change, suggesting enterprise consolidation challenges for a few. The results imply steady progress toward improved livelihoods, with scope to strengthen financial management, value addition, and market access for sustained income growth.

Institutional Support and Networking

26% respondents are part of peer-to-peer or entrepreneur groups. 60.1% respondents accessed institutional supports, while 41.3% required training or support from Green College Odisha initiatives. However, only 4% respondents applied for financial support, and none were successful. This demonstrates that while capacity and mentoring mechanisms exist, financial linkage remains a major constraint.

Sustainability and Demonstration Practices

The model promotes hands-on peer learning: 43.5% respondents participated in demonstration-cum-learning events, and 39% hosted such events. Several entrepreneurs integrate environmentally sustainable methods, such as organic inputs, recycling of farm.

3.2 Qualitative Analysis

The qualitative findings were drawn from Key Informant Interviews (KIIs) with government officials, CSOs, Producer Company (PC) and Producer Group (PG) executives, frontline functionaries (CRPs, Prani Mitras, Krushi Mitras, Udyog Mitras), and from Focus Group Discussions (FGDs) with community members and agri-ecopreneurs across project districts. The analysis integrates insights from the Agro-Ecopreneur dataset and Theory of Change framework to assess institutional capacity, governance systems, entrepreneurship potential, and market readiness under the Green College Odisha Project.

Qualitative data from FGDs, KIIs, and institutional interviews were analysed using a thematic analysis approach. Transcripts and detailed field notes were systematically reviewed to identify recurring patterns, divergences, and explanatory narratives related to capacity, adoption behaviour, and institutional functioning. Themes were derived inductively from the data and mapped to the P-K-S-A-C framework to ensure coherence with the overall analytical design.

Findings from quantitative analysis were systematically triangulated with qualitative insights and institutional diagnostics to strengthen interpretation. For instance, higher reported adoption of sustainable agricultural practices among Producer Group members is supported by qualitative accounts emphasising peer learning, demonstration effects, and access to trusted advisory support. Conversely, limited uptake of mechanisation and micro-irrigation is consistently observed across survey data and FGDs, where high capital costs, scheme access constraints, and risk perceptions were repeatedly cited. Such triangulation enhances confidence in the robustness of observed patterns and supports nuanced interpretation of baseline conditions.

3.2.1 Institutional Capacity

The assessment of Producer Groups (PGs) and Producer Companies (PCs) indicates that institutional development has taken firm root under the APC framework. Over 70 percent of producer institutions have established functional management systems, with regular board meetings, improved record-keeping, and operational monitoring.

However, only about 45 percent of PCs have completed business planning or financial audits, reflecting a need for continued mentoring in financial governance and documentation. FGDs and CSO interviews confirm that institutional linkages have strengthened considerably through convergence with departments such as Agriculture, Horticulture, and Mission Shakti, enabling streamlined access to inputs, credit, and training programs.

3.2.1.1 Human Resource and Capacity Readiness

The field-level human resource base comprising CRPs, Prani Mitras, Krushi Mitras, and Udyog Mitras has been significantly enhanced through Green College trainings. Approximately 65 percent of CRPs demonstrated improved digital literacy and technical proficiency in sustainable agricultural practices. However, adoption of digital MIS tools by PG and PC executives remains relatively low (less than 40 percent). The KIIs underscored the importance of refresher training programs focused on business management, digital data management, and value chain development to sustain institutional growth.

3.2.1.2 Coordination and Convergence Mechanisms

Interviews with government officials revealed substantial progress in inter-departmental coordination facilitated through the Green College framework. CSOs play a central role in mobilization and convergence, especially in supporting women farmers and facilitating credit access. Nevertheless, convergence at the block level remains constrained by procedural delays and communication gaps between PCs and government departments. The study identified the need for a unified coordination mechanism integrating CSO, PC, and departmental MIS systems for effective data-driven decision-making.

3.2.1.3 Institutional Gaps

- **Weak vertical linkages between PGs and PCs:** Limited coordination and information flow reduce collective planning, aggregation efficiency, and joint decision-making, resulting in fragmented institutional functioning.
- **Limited exposure of local leaders:** Many PG/PC leaders lack practical experience in financial management, statutory compliance, and audit processes, increasing dependence on external support and constraining institutional credibility.
- **Need for continuous mentoring:** One-time training has improved awareness, but the absence of structured post-training handholding limits sustained application of skills and institutional strengthening.
- **Lack of a unified digital platform:** The absence of an integrated system for coordination, reporting, and data sharing hampers monitoring, transparency, and learning across PGs, PCs, and partner organizations.

3.2.2 Governance, Entrepreneurship, and Market Readiness

Governance and Institutional Management

The KIIs with PC Board Members revealed significant improvement in governance processes. Nearly 80 percent of PCs reported conducting quarterly board meetings and maintaining

records of key decisions. However, only half of the PCs had adopted formalized governance policies related to procurement, profit distribution, and statutory compliance.

Representation of women's leadership representation remains **25–30 per cent** despite high participation in Producer Groups, including **women-only Producer Companies** in **Kandhamal, Koraput, and Mayurbhanj**. The findings indicate that leadership roles are concentrated among a limited number of experienced women, while domestic workload, time constraints, and limited exposure to statutory and financial responsibilities restrict wider leadership rotation—explaining why participation has not translated into proportional leadership within the institutions studied. Governance performance was notably stronger in districts such as Koraput, Kalahandi, and Rayagada, where continuous CSO facilitation and CRP mentoring have been active.

- ❖ Nearly **80% of Producer Companies (PCs)** conduct regular quarterly board meetings and maintain basic governance records, indicating improved procedural compliance.
- ❖ Only **about 50% of PCs** have formalised policies on procurement, profit-sharing, and statutory compliance, reflecting partial institutional maturity.
- ❖ **Women's leadership representation remains limited (25–30%)** despite high participation in Producer Groups, including women-only PCs in **Kandhamal, Koraput, and Mayurbhanj**.
- ❖ Leadership roles are concentrated among a small group of experienced women due to **domestic workload, time constraints, and limited exposure to statutory and financial responsibilities**.
- ❖ Governance performance is stronger in **Koraput, Kalahandi, and Rayagada**, where continuous CSO facilitation and CRP mentoring are active.

Entrepreneurship Development

The Agro-Ecopreneur dataset indicates that entrepreneurial development has become an emerging strength of the Green College Odisha initiative:

- About 64 percent of eco-entrepreneurs are engaged in agricultural input and nursery businesses,
- 23 percent in livestock enterprises, and
- 13 percent in food processing and value addition.

The average monthly income of eco-entrepreneurs ranges between ₹5,000–₹8,000, reflecting modest but consistent profitability. Training modules on enterprise management, record keeping, and packaging have contributed to better operational practices. Nevertheless, KIs with eco-entrepreneurs and CSOs emphasize challenges such as limited access to credit, lack of business mentorship, and weak exposure to digital marketing. There is a growing demand for microfinance linkage and structured incubation support to scale up these enterprises sustainably.

- ❖ **64% of agro-ecopreneurs** are engaged in agricultural input supply and nursery enterprises, followed by **23% in livestock** and **13% in food processing/value addition**.
- ❖ Average monthly incomes range between **₹5,000–₹8,000**, indicating modest but stable enterprise returns.
- ❖ Training under Green College has improved **record keeping, packaging, and basic enterprise management practices**.
- ❖ Persistent challenges include **limited access to credit**, lack of structured business mentorship, and weak exposure to digital marketing channels.
- ❖ There is strong demand for **microfinance linkages and incubation support** to enable enterprise scaling and sustainability.

Market Readiness and Integration

The analysis of interactions with PC and PG executives suggests a **gradual but uneven shift towards market-oriented practices**. Several Producer Companies reported moving beyond opportunistic sales towards more **predictable buyer relationships**, particularly where aggregation and quality control mechanisms were in place. Eco-entrepreneurs described increasing engagement with **local and periodic markets** as a preferred entry point for enterprise development, while more advanced market channels remain aspirational. Digital and e-commerce platforms were discussed by respondents largely as **emerging opportunities rather than established practices**, constrained by limited digital familiarity, connectivity, and trust in online transactions

FGDs highlighted that **collective marketing experiences**, such as vegetable clusters in **Balangir and Kalahandi**, strengthened farmers' negotiation capacity, reduced distress sales, and improved price outcomes compared to individual selling. Women-led groups were frequently cited as taking on **greater operational responsibility in livestock and value-added micro-enterprises**, reflecting growing confidence, decision-making autonomy, and a gradual redefinition of gender roles within market-facing activities.

- ❖ Around **62% of PCs** report stable buyer relationships, indicating gradual improvement in market orientation.
- ❖ About **40% of eco-entrepreneurs** sell regularly through local markets, while only **15–18%** access digital or e-commerce platforms.
- ❖ FGDs indicate that **collective marketing initiatives**, such as vegetable clusters in **Balangir and Kalahandi**, resulted in **10–15% higher price realisation** compared to individual sales.
- ❖ Women-led groups are increasingly managing **livestock-based and value-added micro-enterprises**, reflecting rising confidence and financial autonomy.

Challenges in Market Integration

- Limited aggregation capacity and working capital within PCs and PGs.
- High dependence on CSOs for buyer identification and logistical arrangements.

The study findings indicate that post-harvest infrastructure constraints in **BRLF intervention districts such as Kandhamal, Koraput, Kalahandi, and Rayagada** arise primarily from a **mismatch between production volumes and available handling capacity**, rather than the complete absence of infrastructure. FGDs and KIs across these districts revealed that during peak harvest periods—especially for vegetables and perishable produce—**production often exceeds the effective capacity of existing aggregation and storage facilities**.

While some storage and aggregation structures exist, they are **limited in scale, unevenly distributed, and often located at a distance from production clusters**, reducing their practical utility for Producer Groups and Producer Companies. In addition, many facilities lack **essential internal infrastructure**, such as grading and sorting platforms, weighing equipment, ventilated storage space, and basic packaging arrangements. As a result, produce cannot be held even for short durations, compelling immediate post-harvest sales.

The evidence suggests that the core issue is **not only the number of storage facilities**, but also their **location, functional capacity, and internal readiness**. Targeted upgradation of existing facilities—combined with better spatial planning to align infrastructure with production clusters—would significantly improve aggregation, reduce distress sales, and strengthen collective marketing outcomes in the BRLF study districts.

In this study, **“limited access”** refers to the **infrequent, indirect, and incomplete availability of market information** to farmers, PGs, and PCs, rather than a complete absence of data. FGDs and KIIs in BRLF study districts—**Kandhamal, Koraput, Kalahandi, and Rayagada**—indicate that most producers currently access price information through **local traders, commission agents, nearby mandis, and informal peer networks**. Some PC leaders also rely on **occasional phone calls to buyers** or past transaction experience to estimate prices.

However, access to **real-time and comparable price data** remains constrained. Specifically, the following gaps were identified:

What data is currently accessed:

- Local mandi prices (often delayed and limited to one market)
- Trader-quoted prices at the time of sale
- Historical prices based on past transactions

What data is not readily available:

- Real-time, multi-mandi price comparisons for the same commodity
- Quality-graded prices linked to produce standards
- Buyer-specific demand and quantity requirements
- Digital **trading platforms** enabling direct listing, bidding, or advance contracts

In addition, limited digital literacy, weak connectivity in interior blocks, and lack of institutional access to e-market platforms constrain effective use of available tools such as e-NAM. As a result, farmers and PCs are unable to time sales, negotiate effectively, or explore alternative buyers, reinforcing dependence on local intermediaries.

- ❖ PCs and PGs face **limited aggregation capacity and working capital constraints**, restricting scale of operations.
- ❖ There is **high dependence on CSOs** for buyer identification, logistics, and market negotiation.
- ❖ **Post-harvest infrastructure gaps**, particularly grading and storage facilities, reduce market competitiveness.
- ❖ Access to **real-time price information and online trading platforms** remains limited across clusters

Emerging Best Practices

- Cluster-based input and marketing models developed in Kandhamal and Mayurbhanj showing replication potential.
- Establishment of eco-enterprise incubation hubs under Green College for goatery, bio-input production, and processing units.

- Integration of trained CRPs as business facilitators in PCs, improving coordination and accountability.
- Convergence with Mission Shakti and APICOL to support credit facilitation and enterprise financing for women-led ventures

Caselet: Cluster-Based Input and Marketing Models in Kandhamal and Mayurbhanj

The cluster-based input and marketing models developed in **Kandhamal** and **Mayurbhanj** illustrate how coordinated production planning and collective market engagement can strengthen smallholder outcomes in tribal and rainfed contexts. These clusters were formed by geographically contiguous Producer Groups cultivating similar crops, enabling synchronised decision-making on inputs, production practices, and marketing.

In **Kandhamal**, the model centred on vegetable and spice crops, where PGs jointly planned input procurement—such as seeds, bio-inputs, and basic equipment—prior to the cropping season. Collective input planning reduced dependence on local traders, ensured timely availability, and improved consistency in crop quality. The proximity of PGs allowed aggregation at the cluster level, making it feasible for Producer Companies to coordinate collection, sorting, and bulk sales. Farmers reported reduced transaction costs and greater confidence in negotiating with buyers due to assured volumes and predictable supply.

In **Mayurbhanj**, the cluster approach was applied to vegetables and allied livelihood activities. PGs coordinated sowing windows and harvesting schedules, which helped avoid market gluts and facilitated staggered supply. Cluster-level aggregation points served as hubs for grading and basic sorting, even where infrastructure was modest. The involvement of trained CRPs as facilitators strengthened coordination between PGs and the PC, ensuring transparency in pricing and payment processes. Women's groups played a visible role in managing aggregation and record-keeping, contributing to improved participation and ownership.

Across both districts, the success of the cluster model was driven not by high-end infrastructure, but by **institutional coordination, collective discipline, and continuous facilitation by CSOs**. The model reduced information asymmetry, strengthened bargaining power, and enabled PCs to engage buyers more systematically. Importantly, farmers perceived the approach as practical and low-risk, as it built on existing social institutions rather than introducing parallel systems.

The **replication potential** of this model lies in its simplicity and adaptability. It requires limited capital investment, relies on existing PG/PC structures, and can be scaled incrementally. With targeted support in cluster identification, seasonal planning, and basic post-harvest handling, similar models can be extended to other BRLF intervention districts. The Green College platform is well positioned to institutionalise this approach by offering cluster-level training on input planning, aggregation management, and market coordination, thereby enabling wider adoption and sustained impact.

Incorporation of Learning Frameworks for Farmers and Government Institutions

The study explicitly situates its findings within established learning and capacity-development frameworks to explain how both farmers and government systems acquire, internalise, and apply knowledge over time. Consistent with BRLF's learning-oriented programme philosophy, learning is conceptualised as an iterative, feedback-driven process rather than a one-time training outcome.

At the farmer level, learning is framed through the P-K-S-A-C (Perception-Knowledge-Skill-Attitude-Capability to Act) framework, which reflects BRLF's emphasis on progressive behavioural change. Training exposure, repeated engagement through Green APC activities, peer learning via collectives (FPOs/SHGs), and on-field demonstrations are analysed as core mechanisms that enable farmers to move from awareness to sustained practice adoption and enterprise development. Survey indicators and qualitative evidence from FGDs and KIIs jointly capture this learning trajectory.

At the government and institutional level, learning is analysed as adaptive institutional learning, wherein frontline extension systems, implementing partners, and local institutions respond to field-level feedback. Monitoring insights, PG member responses, and implementation challenges inform course correction in training design, delivery mechanisms, and convergence strategies. This reflects BRLF's approach of strengthening institutional capacity through continuous learning loops, supervision, and evidence-based refinement.

Empirically, variables such as training intensity, access to extension services, institutional membership, and behavioural readiness—validated through regression analysis and qualitative triangulation—serve as measurable proxies for learning absorption and application. Together, these findings demonstrate that both farmer behaviour change and institutional effectiveness are outcomes of structured, iterative learning processes supported by enabling ecosystems, in line with BRLF's theory of change.

3.2.3 Thematic Analysis of Stakeholder Capacities and Institutional Systems

This section presents the qualitative insights generated through a Birmingham-style thematic analysis using secondary data, KIIs, FGDs and project documents. The analysis focuses on stakeholder capacities, training systems, market engagement, master-trainer availability, and the use of digital/technological solutions within the APC Project.

Table 28: Thematic Analysis

Theme / Focus Area	Key Findings	Supporting Evidence	Measurable Indicators (KPIs)	Recommendations
1. Stakeholder Capacities	Capacities vary widely among frontline workers, CRPs, farmers and FPG/FPC leaders. Training access limited (≈26%). Weak coordination	Only about one-fourth of stakeholders reported access to any formal training in the last two years. KIIs revealed that CRPs and frontline staff often rely on ad hoc guidance, with limited joint planning meetings	- Stakeholder training coverage (%) - CRP refresher training rate	Develop structured capacity enhancement plan; periodic refresher training; block-level coordination platforms.

Theme / Focus Area	Key Findings	Supporting Evidence	Measurable Indicators (KPIs)	Recommendations
	between CSOs and government.	between CSOs and block-level government functionaries.		
2. Production Scale & Aggregation Constraints	Small production volumes and lack of aggregation limit market participation and income realisation. Most households sell individually to local traders.	FGDs showed that small volumes and lack of aggregation force households to sell individually to local traders. Most FPGs reported no direct buyer contracts, and annual sales per household remain low due to distress selling and limited holding capacity.	• Avg. volume aggregated per FPG • % households participating in collective sales • Avg. annual sales per household	Promote aggregation at FPG/cluster level; develop collective storage and primary processing facilities; link aggregation with buyer contracts
3. Trades & Market Challenges	FPGs/FPCs engaged in vegetables, NTFPs, livestock; most households sell <₹5,000 annually. Market linkages weak and dependent on middlemen.	KIIs indicated that trainer availability varies sharply by block, with some blocks having multiple trainers and others none. Absence of a standard certification system leads to uneven training quality and duplication of ToTs.	• % FPG/FPCs with buyer linkages • Annual sales per household • Collective marketing initiatives	Introduce aggregation models, buyer linkages, business mentoring, and value chain interventions.
4. Master Trainer Pool	No centralized roster; inconsistent certification; uneven distribution across blocks.	Household survey data show that over half of households lack personal smartphones or reliable connectivity. FGDs highlighted strong acceptance of video-based group learning and facilitated sessions, even where individual phone access is low.	• Certified trainers by domain • Trainer performance evaluation % • CRP-to-trainer ratio	Create master trainer registry; annual ToTs; competency-based evaluation.
5. Digital & Technological Solutions	57% households lack mobile phones. Digital learning minimal. Potential for hybrid low-tech solutions (video, IVR, community screens).	Only 18% crop farmers and 3% livestock rearers reported insurance coverage. KIIs revealed that most FPGs lack awareness and handholding to access formal finance, relying instead on personal savings or informal credit.	• % trainings using digital aids • Household digital access • No. of hybrid learning pilots	Establish digital hubs; create vernacular content; deploy IVR/WhatsApp-based micro-learning.

Theme / Focus Area	Key Findings	Supporting Evidence	Measurable Indicators (KPIs)	Recommendations
6. Financial & Value Chain Support	Loan access moderate; insurance extremely low (crop 18%, livestock 3%). Enterprise financing limited.	Only about one-fourth of stakeholders reported access to any formal training in the last two years. KIIs revealed that CRPs and frontline staff often rely on ad hoc guidance, with limited joint planning meetings between CSOs and block-level government functionaries.	• Insurance coverage % • No. of FPGs linked to financial institutions • Value chain financing uptake	Promote bundled insurance; link FPGs with micro-finance; financial literacy drives.

Note: Themes present recurrent patterns across interviews and FGDs and do not imply uniform prevalence across all locations.

Summary of Key Qualitative Findings

The thematic analysis shows that although the APC project has a strong institutional presence through CSOs, frontline staff and community-based organizations, there are clear gaps in standardized training systems, digital learning infrastructure, and market integration for farmers and producer groups. The findings highlight the need for integrated capacity-building plans, digital inclusion models, and structured market linkage interventions to enhance livelihood outcomes.

Implications for Project Implementation

- Clear mapping of master trainers and CRPs will strengthen skill delivery.
- Standardized training modules will improve quality and comparability across blocks.
- Digital tools can significantly enhance outreach in remote geography.
- Market linkage interventions are essential to improve income outcomes for FPGs/FPCs.
- KPIs developed under this analysis can be integrated into PMU's monitoring system.

The findings presented in this chapter describe baseline conditions, observed associations, and institutional realities at the time of the study. Programme implications and recommendations are derived through synthesis of these findings with implementation experience, policy priorities, and operational considerations, and are presented separately in the subsequent sections.

4 Training Needs Assessments

The assessment identifies specific gaps and capacity-building requirements among different stakeholder groups engaged under the APC initiative. The analysis emphasizes skill enhancement, institutional strengthening, and inclusive learning mechanisms to ensure effective implementation and sustainability of the programme.

4.1 Gaps and requirements of Trainings for

4.1.1 PG Member

Farmers exhibited limited exposure to sustainable and climate-resilient agricultural practices, digital literacy, and record-keeping. Their training needs revolve around improving technical know-how on crop production, soil health management, and integrated farming systems. Capacity building should focus on practical demonstrations, peer learning, and locally adapted training modules to enhance productivity and livelihood diversification.

The study analyzed the training needs of farmers to determine priority areas for capacity building under the Green College Odisha project intervention. The findings reveal that farmers expressed interest in skill enhancement across multiple areas, particularly those linked to income generation and sustainable farming practices.

More training required for farmers

1. Training Needs in Agricultural Practices

The assessment shows that while farmers have basic awareness of sustainable agriculture practices, the depth of understanding and ability to apply them consistently remains low. Project farmers have received more training than control households, yet core technical gaps persist. Farmers need structured, hands-on modules in:

- **Improved agronomic practices** (line sowing/SRI, seed treatment, spacing, crop rotation).
- **Organic and Natural Farming (NPM)** techniques with practical demonstrations.
- **High-value crop cultivation** and package of practices suited to local agro-climatic zones.
- **Climate-smart agriculture**, drought-resilient practices, and risk-mitigating cropping patterns.
- **Farm mechanization**, including safe handling, small machinery operation, and maintenance.
- **Post-harvest management** (grading, sorting, storage, value addition) to reduce losses.

2. Training Needs in Soil Health Management

Despite good awareness of soil health concepts, actual adoption particularly soil testing remains weak. Farmers continue relying on traditional knowledge for fertilizer decisions. Key training needs include:

- **Soil testing literacy**: understanding soil reports, nutrient deficiency identification, and recommended corrective measures.
- **Organic matter management** including composting, vermicomposting, biofertilizer use, and mulching.
- **Balanced nutrient management**, safe chemical fertilizer application, and reduction of chemical overuse.

- **On-farm organic input preparation**, including botanical extracts and bio-pesticides.
- **Green manuring and crop rotation** for long-term soil fertility and moisture conservation.

Strengthening soil literacy is essential to shift farmers from perception-based to evidence-based nutrient practices.

3. Training Needs in Water Management

Water scarcity remains the biggest constraint across both project and control areas. Training needs are critical in this domain, especially given high dependence on rainfed agriculture. Farmers require capacity-building in:

- **Water-saving irrigation technologies** such as drip, sprinkler, and pitcher irrigation.
- **Rainwater harvesting**, farm ponds, and low-cost water storage structures.
- **Groundwater recharge and contour bunding** for hilly and tribal landscapes.
- **Efficient irrigation scheduling**, reducing water wastage and optimizing crop-water ratios.
- **Solar-powered and low-cost irrigation solutions** to reduce high diesel-related irrigation costs.
- **Command area and community irrigation management**, encouraging collective use of water resources.

Training should include demonstrations and practical exposure to make water-efficient farming replicable at the household level.

4. Training Needs in Livestock and Allied Practices

Farmers recognize the income and resilience benefits of integrating livestock with crop production but require deeper technical and enterprise-level skills. Based on the gaps identified:

- **Scientific rearing practices** for goatery, poultry, and cattle, including shed design and hygiene.
- **Improved breeding and nutrition management**, fodder planning, silage preparation, and low-cost feed formulation.
- **Preventive animal health**, vaccination schedules, common disease management, and first-aid.
- **Integrated livestock-crop systems**, including manure management, nutrient recycling, and fodder-manure balance.
- **Livestock enterprise development**, record-keeping, cost-benefit analysis, and market linkage.

These skills are necessary for transitioning farmers from traditional husbandry to more productive, commercially viable livestock enterprises.

5. Training Needs in Market Linkages and Value Chain Development

FGDs show persistent challenges in finding reliable markets, dealing with middlemen, and high transportation costs. Strengthening market capabilities requires training in:

- **Collective marketing systems** through PGs/PCs, aggregation models, and buyer negotiations.
- **Grading, sorting, and quality standards**, especially for high-value crops and organic produce.
- **Price discovery mechanisms**, understanding MSP, e-NAM, and local mandi operations.
- **Market intelligence**, demand forecasting, and linking enterprises to institutional buyers.

- **Cost reduction strategies** such as collective transport, bulk procurement of inputs, and shared logistics.
- **Enterprise development skills** for mushroom cultivation, nursery management, goatery, farm mechanization services, and agri-input/output business.

Strengthened market literacy will reduce exploitation by intermediaries, improve bargaining power, and enable farmers to capture higher value.

4.1.2 Agro- Ecopreneur's

Agro-Ecopreneurs require intensive support in enterprise management, business planning, and digital marketing. The assessment revealed gaps in understanding value chain development, financial management, and branding of agricultural produce. Training interventions should emphasize entrepreneurship development, market linkage creation, and use of ICT tools for business operations and sustainability.

Training required

The Baseline Study of Agro-Ecopreneurs identified several enterprise-specific and cross-cutting capacity gaps across agri-based and service-oriented trades. To strengthen rural entrepreneurship and improve market readiness, targeted capacity-building support is essential.

The following trade-wise training needs are recommended to equip Agro-Ecopreneurs with the technical and managerial skills required for sustainable enterprise growth:

1. Crop-Based and Agroecology Enterprises

- Training in business planning for crop enterprises, including costing, pricing, and profitability.
- Skills in sustainable production methods (organic farming, input preparation, soil and water management).
- Exposure to market standards for quality, grading, and packaging of fresh produce.

2. Livestock, Poultry, and Goatery Enterprises

- Training in scientific livestock management, disease prevention, and fodder planning.
- Enterprise-level skills in milk/meat value chains, record keeping, and financial planning.
- Guidance on market linkages for goatery, backyard poultry, and dairy products.

3. Mushroom, Nursery, and Horticulture Enterprises

- Practical training in mushroom production cycles, spawn use, hygiene, and low-cost units.
- Nursery enterprise skills: seedling production, potting mixtures, orchard planting material, and plant health care.
- Marketability training: branding, packaging, and connecting with florists, fruit traders, and institutional buyers.

4. Agri-Input & Output Supply Business

- Training in inventory management, GST basics, and procurement systems.
- Skills on input handling, safe storage, and advisory on seeds, fertilizers, and crop protection inputs.
- Strengthening vendor tie-ups and establishing linkages with FPOs/PCs for bulk supply.

5. Farm Mechanization & Service-Based Enterprises

- Technical hands-on training for operating and maintaining equipment (tillers, sprayers, threshers).
- Entrepreneurial skills for service pricing, record keeping, and customer management.
- Market linkage training for connecting with farmer groups and providing on-demand services.

6. Value Addition, Processing & Small Agribusiness Trades

- Training on basic processing techniques (millets, spices, pulses), food safety, and FSSAI basics.
- Skills in packaging, branding, and small-scale machinery handling.
- Market training for product marketing, shelf placement, and retailer linkages.

7. Digital & Online Marketing Enterprises

- Training on digital literacy, use of smartphones for business, digital payments, and online record keeping.
- Skills in social media promotion, WhatsApp sales, e-commerce basics, and product photography.
- Awareness on digital tools for input sourcing, price tracking, and customer engagement.

8. Financial Access, Credit Linkage & Enterprise Scaling

- Training on loan application processes, required documentation, and credit products for entrepreneurs.
- Guidance on preparing bankable business plans and maintaining financial records.
- Capacity building for scaling enterprises, managing cash flows, and sustainability planning.

4.1.3 PC and PG members

Producer Groups are **village-level farmer collectives** formed to organize small and marginal farmers, primarily for improving access to agricultural services such as inputs, training, and advisory support. PGs function as the **first institutional layer** where farmers come together to share knowledge, adopt best practices, and collectively address production-related challenges.

Table 29: Challenges faced by Producer Groups

Types of Challenge	Nature of Challenge (Reported)	Blocks Reporting the Challenge
Input Availability & Timeliness	1. Delayed supply of seeds/fertilisers 2. Limited access to quality inputs 3. Dependence on private dealers 4. Price variability of inputs 5. Weak last-mile distribution	Belpada, Semiliguda, Bisamkatak
Water Scarcity & Irrigation Gaps	1. High dependence on rainfall 2. Limited irrigation coverage 3. Inadequate water harvesting 4. Poor maintenance of structures 5. Seasonal water stress	Khaprakhol, Lanjigarh
Market Linkage & Price Volatility	1. Lack of organised buyers 2. Poor price discovery 3. Distress selling	Thakurmunda, Borigumma

Types of Challenge	Nature of Challenge (Reported)	Blocks Reporting the Challenge
	- Weak negotiation power - Absence of forward contracts	
Labour Shortage & Rising Costs	- Seasonal migration of youth - Shortage of skilled labour - Rising wage rates - Peak-season labour mismatch - Limited mechanisation	Kankadahad
Low Adoption of Improved Practices	- Limited exposure to new practices - Risk aversion - Weak extension follow-up - Knowledge-practice gap - Reliance on traditional methods	Bisamkatak, Kantamal
Transport & Logistics Constraints	- Poor road connectivity - High transport costs - No aggregation points - Small volumes per farmer - Irregular transport availability	Kolnara, Laikera
Financial Access Constraints	- Low formal credit access - Complex documentation - Low financial literacy - Limited working capital - Dependence on informal loans	Baliguda
Weak Extension & Training Outreach	- Irregular field visits - Low training awareness - Staff shortages - Limited local demonstrations - Poor feedback mechanisms	Kantamal, Khariar
Storage & Post-Harvest Infrastructure Gaps	- No village-level storage - Lack of cold chain - Quality deterioration - Immediate selling pressure - Post-harvest losses	Banspal, Laikera
Climate Variability & Weather Risks	- Erratic rainfall - Untimely monsoon - Increased crop stress - No local advisories - Limited adaptation practices	Harichandanpur
High Cost of Cultivation	- Rising input prices - High labour cost - Transport expenses - Low economies of scale - Reduced profit margins	Semiliguda
Soil Fertility & Nutrient Management Issues	- Limited soil testing - Imbalanced fertiliser use - Low organic matter - Poor micronutrient awareness - Yield decline	Lanjigarh

Types of Challenge	Nature of Challenge (Reported)	Blocks Reporting the Challenge
Low Scheme Awareness & Information Flow	1. Inadequate dissemination 2. Complex guidelines 3. Weak last-mile communication 4. Low trust/clarity 5. Missed benefits	Belpada, Khariar
Institutional Capacity Gaps (PG/PC Level)	1. Weak governance systems 2. Poor role clarity 3. Limited leadership skills 4. Inadequate SOPs 5. Weak coordination	Laikera, Kankadahad
Digital Access & Literacy Constraints	1. Limited smartphone access 2. Low digital skills 3. Poor network connectivity 4. App usability issues 5. Low adoption	Belpada, Kantamal
Risk Management & Crop Insurance Gaps	1. Low enrolment 2. Poor scheme awareness 3. Complex claim process 4. Delayed settlements 5. Low trust in insurance	Harichandanpur, Khariar

The capacity-building gaps shown in the table indicate that PG executive members currently possess limited knowledge across several functional areas. Covering these gaps in future few recommendations are given below:

Covering these
gaps
recommended
few actions in
future



Figure 26: Recommended action plan for PG executive participants

Producer Companies are **formal, registered farmer-owned business organizations**, established under the Companies Act to engage in commercial agricultural activities. PCs create **market-driven enterprise models**, enabling farmers to aggregate produce, gain bargaining power, and access wider value chains.

Table 30: Challenges faced by Producer Companies

Key Challenge	Define challenges	Responses received from blocks
Vendor-related Issues	1) Limited number of reliable buyers 2) Irregular procurement schedules 3) Price manipulation by vendors 4) Weak long-term contracts 5) High dependency on middlemen	Belpada, Borigumma, Lanjigarh
Weak Market Linkages	1) Absence of organised buyers 2) Limited access to distant mandis 3) Poor buyer networks 4) Low bargaining power 5) Distress selling	Belpada, Kolnara, Banspal, Harichandanpur
Marketing Skill Deficits	1) Poor price negotiation skills 2) Limited market intelligence 3) Weak branding/packaging knowledge 4) Inadequate sales planning 5) Low customer communication skills	Khaprakhol, Baliguda, Kantamal
Price Volatility	1) Seasonal price fluctuations 2) Lack of price forecasting 3) No minimum price assurance 4) Dependence on spot markets 5) Income instability	Thakurmunda
Infrastructure & Transport Constraints	1) Poor road connectivity 2) High transport costs 3) Lack of aggregation points 4) Delays in produce movement 5) Post-harvest losses	Khaprakhol
Compliance-related Issues	1) GST filing complexity 2) Statutory reporting burden 3) Limited regulatory awareness 4) Poor documentation systems 5) Risk of penalties	Bisamkatak, Laikera
Record-Keeping Challenges	1) Absence of standard formats 2) Manual and inconsistent records 3) Limited financial tracking 4) Low digital literacy 5) Weak audit readiness	Baliguda, Kantamal
Business Planning Gaps	1) No annual business plans 2) Poor cost-profit analysis 3) Weak sales projections 4) Short-term decision-making 5) Limited growth strategy	Banspal
Market Communication Bottlenecks	1) Delayed buyer communication 2) Inconsistent information flow 3) Lack of digital channels	Khariar, Lanjigarh

Key Challenge	Define challenges	Responses received from blocks
	4) Weak coordination among members 5) Missed sales opportunities	
Production Coordination Issues	1) Unplanned production volumes 2) Quality inconsistency 3) Weak farmer coordination 4) Mismatch between demand and supply 5) Lack of production calendars	Semiliguda, Laikera
Supply Chain & Logistics Gaps	1) Inefficient routing 2) No logistics SOPs 3) Limited transport partners 4) Storage gaps 5) High handling losses	Lanjigarh, Laikera
Capacity Building / Training Needs	1) Limited exposure to markets 2) Inadequate technical skills 3) Weak managerial capacity 4) Low confidence in operations 5) Dependence on external support	Kankadahad

Working Capital Scenario: Baseline Status

A review of working capital sources shows **very limited access to formal financial systems**:

Member Contributions – Primary Source

- Member contributions are the **most common and primary** source of working capital across most blocks. While own savings remain the primary source of working capital across most blocks, PCs also access **government-provided working capital** and **IB/CB funds**. However, access and timely utilisation of these funds vary across PCs due to compliance requirements and procedural delays, leading many to continue relying on internal resources
- This indicates strong internal mobilization and reliance on self-financing rather than external credit.

Government Support (Mission Shakti) – Secondary Source

- Mission Shakti or similar government support emerges as the **second most preferred** financing option.
- This demonstrates government interventions are effective but still not the dominant resource everywhere.

Low Dependence on Bank Loans

- Only four blocks reported access to or utilization of bank loans:
 - **Khaprakhol**
 - **Bisamkatak**
 - **Kantamal**
 - **Laikera**
- Indicates limited financial inclusion and access to formal institutions.

Very Limited Use of Grants

- Grant support is found in only two blocks:

- **Baliguda**
- **Lanjigarh**
- Suggests that developmental agencies or special funding initiatives are not widespread.

“PCs are still building markets. Until farmers see clear business returns, mobilization remains slow.” PC executive, KII, Kalahandi district

Blocks Using Multiple Capital Sources

Some blocks have diversified sources of working capital, which strengthens their financial sustainability:

Table 31: Block wise multiple sources for arranging fund

Block	Sources Used for arranging funds
Khaprakhol	Member Contributions + Bank Loan
Bisamkatak	Bank Loan + Mission Shakti
Kantamal	Member Contributions + Bank Loan
Laikera	Member Contributions + Bank Loan
Baliguda	Member Contributions + Grants

Across several project blocks, farmers and PG members face limited access to formal finance due to low financial literacy, weak documentation capacity, and lack of awareness about suitable government schemes. As reflected in Khaprakhol, Kantamal, Laikera, and Baliguda, most groups rely primarily on member contributions and small bank loans, while only a few, such as in Bisamkatak, are able to leverage Mission Shakti or grant-based support. These financing patterns indicate structural constraints such as cumbersome paperwork, low confidence in bank processes, and limited facilitation support for credit-linked schemes. Many other blocks also expressed the need for simple, low-documentation government funding options—such as subsidised credit, small enterprise grants, or revolving funds—so that farmers can access capital without procedural delays. Strengthening awareness and handholding support through CSOs, frontline functionaries, and PG/PC institutions will be essential for enabling farmers to access these schemes more easily and build financially resilient enterprises.

Table 32: Reported Challenges and Strategies from Stakeholder PG & PC Executive and PC Board Member

Capacity Gap	Reported Challenges	Blocks Where Observed	Response Strategy from Stakeholder
Marketing Skills	1) Poor price discovery 2) Weak negotiation capacity 3) Limited buyer awareness 4) Dependence on local traders 5) Lack of market intelligence	Belpada, Thakurmunda, Kolnara, Borigumma	1) Training in price trends and mandi systems 2) Negotiation skill workshops 3) Buyer mapping and directories 4) Exposure visits to mandis/processors 5) Weekly digital market updates
Financial Literacy & Access	1) Low awareness of credit products 2) Poor budgeting skills 3) Limited insurance uptake	Belpada, Baliguda, Khariar	1) Financial literacy training 2) Credit and working-capital planning sessions 3) Insurance awareness camps

Capacity Gap	Reported Challenges	Blocks Where Observed	Response Strategy from Stakeholder
	4) Documentation challenges 5) Dependence on informal loans		4) Documentation hand-holding 5) Bank/MFI interface meetings
Record Keeping & Documentation	1) No standard record formats 2) Irregular data entry 3) Low literacy constraints 4) Weak financial tracking 5) Poor use of records for decisions	Belpada	1) Introduce simple record templates 2) Practical bookkeeping sessions 3) Visual/low-text registers 4) Monthly record reviews 5) Link records to pricing and planning
Production – Climate & Water Efficiency	1) Rainfall dependence 2) Low adoption of water-saving practices 3) Poor crop planning 4) Limited climate awareness 5) Inadequate demonstrations	Khaprakhol, Harichandanpur	1) Climate-smart agriculture demos 2) Water-use efficiency training 3) Crop planning sessions 4) Climate advisory dissemination 5) Farmer field schools
Production – Mechanisation	1) Labour shortages 2) Low machinery skills 3) High hiring costs 4) Poor maintenance knowledge 5) Safety concerns	Kankadahad	1) Hands-on equipment training 2) Custom hiring centre exposure 3) Cost-benefit sessions 4) Maintenance demonstrations 5) Safety and operation training
Production – Pest & Disease Management	1) Late pest identification 2) Excessive pesticide use 3) Limited IPM awareness 4) Input unavailability 5) Health risks	Bisamkatak	1) Pest identification training 2) IPM modules 3) Safe pesticide handling sessions 4) Input planning guidance 5) Field-level demonstrations
Production – Input Optimisation	1) Overuse of inputs 2) Rising cultivation costs 3) Poor planning 4) Limited cost tracking 5) Low efficiency	Semiliguda	1) Input budgeting training 2) Cost-effective practice demos 3) Seasonal input calendars 4) Production planning tools 5) Peer learning sessions
Production – Soil Health Management	1) Low soil testing coverage 2) Imbalanced fertiliser use 3) Low organic matter 4) Micronutrient deficiency 5) Yield decline	Lanjigarh	1) Soil testing campaigns 2) Fertiliser application training 3) Organic input promotion 4) Micronutrient awareness sessions 5) Soil health monitoring
Business Planning	1) No seasonal plans 2) Weak enterprise vision 3) Poor cost-profit analysis 4) Short-term decision-making	Kantamal, Harichandanpur	1) Seasonal and annual planning workshops 2) Enterprise development modules

Capacity Gap	Reported Challenges	Blocks Where Observed	Response Strategy from Stakeholder
	5) Limited scalability		3) Costing and profitability training 4) Mentoring support 5) Simple business plan templates
Supply Chain & Logistics – Storage	1) No storage facilities 2) High post-harvest losses 3) Poor handling practices 4) Immediate selling pressure 5) Quality deterioration	Banspal, Laikera	1) Storage handling training 2) Loss-reduction techniques 3) Grading and packaging sessions 4) Collective storage models 5) Market-linked storage planning
Supply Chain & Logistics – Aggregation & FPO Linkages	1) Small fragmented volumes 2) Weak aggregation systems 3) Limited FPO exposure 4) Poor coordination 5) Low bargaining power	Kolnara, Borigumma, Laikera	1) Aggregation SOP training 2) Collective marketing models 3) FPO process orientation 4) Buyer–seller meets 5) Bulk sale facilitation

PC and PG Executive and PC Board members need strengthened capacities in governance, cooperative management, and financial literacy. Key training gaps include inadequate understanding of institutional processes, poor record maintenance, and weak leadership participation. Focused modules on governance structures, business planning, and digital reporting can empower these institutions to manage collective operations effectively and inclusively.

4.1.4 Frontline Functionaries

Frontline functionaries, including CRPs and field facilitators, demonstrated moderate technical and extension skills but required enhanced proficiency in participatory facilitation, digital data management, and communication. Training should focus on modern extension techniques, ICT integration, and inclusive facilitation methods to ensure efficient service delivery, data quality, and sustained farmer engagement.

Table 33: Key Reported Challenges and Strategies from Frontline Functionaries

Key Capacity Gap	Reported Challenges	Consolidated Blocks / Districts	Response Strategy from Stakeholder
Business & Enterprise Planning Gaps	1) Weak enterprise planning skills 2) Limited understanding of value chains 3) Poor cost–profit analysis 4) Inadequate market-oriented planning 5) Low scalability vision	Belpada, Kolnara, Laikera	Enterprise planning training; value-chain orientation; market-led planning tools
Market Linkage & Value	1) Poor buyer connections 2) Limited knowledge of value addition	Belpada, Kolnara, Lanjigarh	Market-connect platforms; processing

Key Capacity Gap	Reported Challenges	Consolidated Blocks / Districts	Response Strategy from Stakeholder
Addition Constraints	3) Weak B2B marketing skills 4) Low exposure to processors/markets 5) Dependence on local traders		exposure; B2B tie-ups
Digital & MIS Capacity Gaps	1) Low digital literacy 2) Weak MIS usage 3) Manual reporting systems 4) Delayed data flow 5) Limited data-based decision-making	Khaprakhol, Khariar	Digital literacy training; MIS tools; standard reporting formats
Financial Literacy & Credit Linkage Gaps	1) Poor understanding of credit products 2) Weak linkage with banks/SHGs 3) Limited risk management skills 4) Poor pricing and costing knowledge 5) Low confidence in financial facilitation	Khaprakhol, Borigumma	Financial literacy modules; SHG-bank linkage facilitation
Technical Knowledge Gaps – Crops & Horticulture	1) Limited exposure to improved practices 2) Weak NPM/organic knowledge transfer 3) Low understanding of high-value crops 4) Inadequate field demonstrations 5) Poor advisory confidence	Thakurmunda, Kantamal, Lanjigarh	Hands-on demos; soil health campaigns; high-value crop training
Water & Irrigation Management Gaps	1) Limited exposure to micro-irrigation 2) Weak advisory on water-use efficiency 3) Poor knowledge of subsidy schemes 4) Low adoption of tools 5) Inadequate demonstrations	Kankadahad	Exposure visits; promotion of drip/sprinkler systems
Livestock & Allied Sector Skill Gaps	1) Limited scientific livestock knowledge 2) Poor disease management skills 3) Weak advisory on poultry/goatery 4) Inadequate practical exposure 5) Low enterprise orientation	Bisamkatak, Laikera	Practical livestock training; enterprise-focused modules
Input & Supply Chain Coordination Issues	1) Weak linkage with input suppliers 2) Delayed input availability 3) Poor coordination with dealers 4) Lack of local depots 5) Inconsistent advisory support	Harichandanpur	Establish input depots; strengthen dealer-functionary linkage
Farmer Mobilisation & Social Constraints	1) Low farmer participation 2) Social and trust barriers 3) Weak group cohesion 4) Poor leadership at village level	Banspal	Community mobilisation activities; PG strengthening

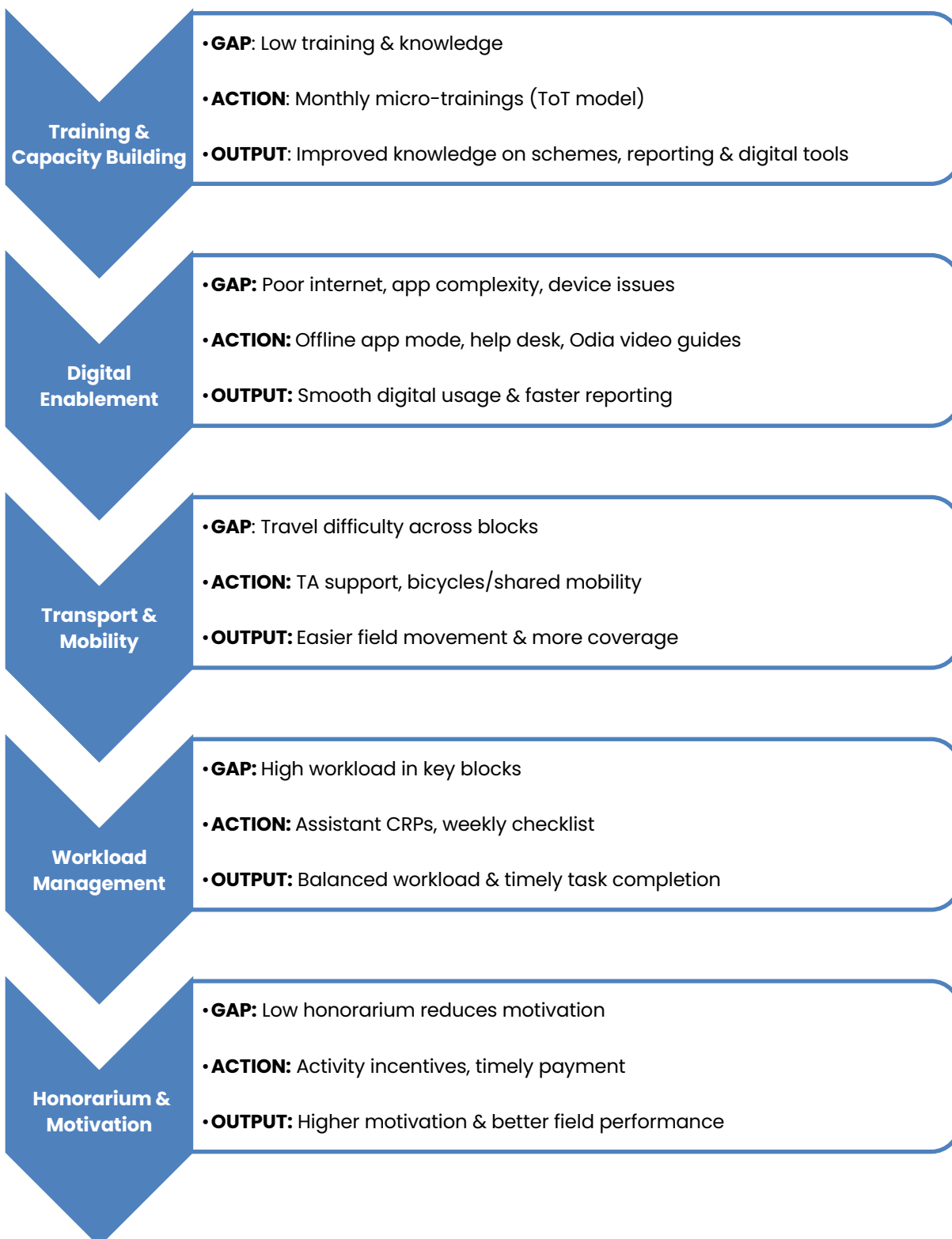
Key Capacity Gap	Reported Challenges	Consolidated Blocks / Districts	Response Strategy from Stakeholder
	5) Limited collective action		
Sustainable & Climate-smart Practice Adoption Gaps	1) Low adoption of organic/NPM practices 2) Limited demo plots 3) Weak climate risk understanding 4) Lack of local champions 5) Inadequate follow-up	Semiliguda	Organic/NPM training; demo plots; climate-smart advisories
Monitoring, Documentation & Reporting Gaps	1) Weak monitoring systems 2) Inconsistent reporting 3) Poor documentation formats 4) Limited review mechanisms 5) Low accountability	Khariar, Bisamkatak	MIS training; monthly review systems; simple documentation tools
Institutional Coordination & Convergence Gaps	1) Weak inter-departmental coordination 2) Poor scheme awareness dissemination 3) Irregular convergence meetings 4) Role ambiguity 5) Fragmented service delivery	Baliguda	Block-level convergence meetings; scheme awareness camps

frontline functionaries demonstrate strong community mobilization capacity. However, their operational efficiency is constrained by low digital literacy, weak business and market linkage knowledge, limited access to financial institutions, and logistical barriers in tribal and remote blocks. Strengthening technical skills, enterprise development training, and institutional convergence will be critical to enhancing service delivery and improving livelihood outcomes for farmer producer groups.

The overall frontline team is **strong in mobilization**, but needs **upskill in market, finance, and digital domains**.

- Most blocks show **limited capacity in enterprise management and sustainable agriculture**.
- Targeted training, exposure, and institutional linkages can significantly improve support to farmer/SHG PG members.

Thematic Diagram/Action Plan



4.2 Providers of Training

Training delivery under the APC framework is supported by both government departments and CSO partners, each contributing distinct strengths in technical expertise and community engagement.

4.2.1 Government Departments

Government frontline officials play an essential function as **link institutions** between development programs and community PG members. In the rural and tribal context of Odisha, they act as **facilitators, mobilizers, scheme navigators, and technical support providers via convergences**. Their support promotes:

- Access to government schemes
- Enterprise and livelihood development
- Formation and strengthening of farmer institutions (PGs/SHGs/FPOs)
- Delivery of training and capacity-building programs

Government departments like Agriculture, Horticulture, and Animal Husbandry provide structured, technology-based, and scheme-linked trainings through KVKs, ATMA, and SAUs. Their focus is on productivity enhancement, scientific practices, and convergence of government initiatives.

Table 34: Reported challenges and Strategies from Govt. Officials

Key Support / Challenge Reported	Blocks Affected	Response Strategy
Low Awareness & Need for Simple Communication	Belpada, Banspal, Harichandanpur, Laikera	Simple IEC materials, local-language communication, audio-visual and pictorial tools, awareness camps
Behaviour Change & Resistance to New Practices	Khaprakhol, Thakurmunda, Baliguda	Behaviour-change communication (BCC) training, demonstrations, repeated follow-ups, confidence building
Low Literacy & Comprehension Barriers	Kankadahad, Lanjigarh	Pictorial/visual materials, simplified technical concepts, literacy-friendly training formats
Need for Practical / Field-based Demonstrations	Thakurmunda, Bisamkatak, Khariar	On-field demonstrations, hands-on learning, practical exposure to technologies and practices
Livelihood Timing & Attendance Constraints	Bisamkatak, Borigumma	Flexible timing, half-day sessions, incentives, alignment with daily labour schedules
Language & Cultural Barriers (including tribal context)	Kolnara, Harichandanpur, Banspal	Use of local/tribal co-trainers, culturally sensitive communication, community engagement tools
Weak Motivation & Low Aspirations	Semiliguda, Laikera, Borigumma	Motivation strategies, exposure visits, regular follow-up, counselling and mentoring

Key Support / Challenge Reported	Blocks Affected	Response Strategy
Communication & Mobilisation Challenges	Baliguda, Kantamal, Harichandanpur	Improved communication tools, mobilisation support, addressing superstition and misinformation
Monitoring & Follow-up Gaps	Semiliguda, Laikera	Simple monitoring formats, follow-up tools, regular review meetings
Financial Constraints of Participants	Khariar, Borigumma	Information on financial support options, incentives, linkage with schemes and benefits
Safety & Context-specific Risks	Kolnara	Safety awareness during field activities (e.g., wild animals), secure training arrangements

Support needed from Government Officials

The analysis confirms that block-level government officials are fully involved in livelihood convergence activities across all clusters, yet their efficiency is constrained by communication, mobility, and community engagement barriers. Strengthening institutional capacity, outreach tools, and technical exposure is essential for reinforcing the last-mile delivery system and ensuring sustainable livelihood enhancement for rural households.

The specific types of support required from government departments and local officials across different project blocks. These insights reflect the practical challenges faced by communities and the kind of facilitation needed to strengthen adoption, communication, and access to schemes. The support needs range from improving Information, Education & Communication (IEC) tools, enhancing behaviour-change communication, and providing skill-based training to addressing language barriers, social biases, and logistical challenges. Each block requires a tailored approach based on its local context, community characteristics, and existing gaps in communication and outreach.

Action Plan for training support for Government Officials

Table 35: Action Plan for training support

Stakeholder Group	Observed Learning Behaviour (Evidence from TNA / FGDs / KIIs)	Most Effective Learning Pedagogy (Literature + Field Evidence)	Appropriate Learning Tools & Methods	Action Plan
Farmers (Small & Tribal)	• High awareness, low adoption • Learn by seeing results • Risk-averse to new practices	Experiential & Demonstration-based Learning (Farmer Field School, Kolb's Experiential Learning)	• Demonstration plots • Visual IEC kits • Field days • Peer farmer interaction	• Demo plots for crops/NTFP • IEC kits & videos in local language • Field-based trainings
Tribal Women Farmers	• Time-poor due to labour burden	Social & Peer Learning (IFAD/UN	• Village-level sessions	• Village-based trainings

Stakeholder Group	Observed Learning Behaviour (Evidence from TNA / FGDs / KIIs)	Most Effective Learning Pedagogy (Literature + Field Evidence)	Appropriate Learning Tools & Methods	Action Plan
	• Language & mobility constraints • Prefer trusted local facilitators	Women Gender Pedagogy)	• Tribal women co-trainers • Flexible timing	• Co-trainers from SHGs • Community mobilisation teams
Agro-Ecopreneurs / Youth	• Interested in income outcomes • Learn from real market exposure • Prefer practical enterprise examples	Problem-based & Enterprise Learning (Adult Learning Theory – Knowles)	• Business clinics • Market exposure visits • Costing & pricing exercises	• Market linkage focus • Enterprise demo units • Buyer coordination exposure
Producer Group (PG) Members	• Weak documentation skills • Learn through practice, not theory	Practice-Oriented Institutional Learning	• Mock record keeping • Simple templates • Guided practice	• Simple formats & checklists • On-site mentoring
Producer Company (PC) Board & Staff	• Governance gaps • Limited business planning capacity	Simulation & Applied Governance Learning	• Case studies • Role-play simulations • Board-level workshops	• Targeted capacity building • MIS & compliance support
Frontline Workers (CRPs, Mitras)	• High workload • Skill dilution over time • Need refresher inputs	Reinforcement & Mentoring-based Learning	• ToT modules • Refresher trainings • Mobile checklists	• ToT for officials • Monthly reviews • Mobile-based monitoring
Government Officials (Block/District)	• Strong technical knowledge • Weak community communication	Cascade Training & Communication Pedagogy	• ToT workshops • IEC facilitation tools	• Capacity building of officials • Communication toolkits
All Stakeholders (Cross-cutting)	• Smartphone access but limited effective use • Digital tools only useful when linked to livelihood	Embedded Digital Learning (Not standalone ICT training)	• Mobile checklists • Advisory apps • MIS linked to quality & pricing	• Digital MIS rollout • Mobile monitoring • Quality & parity awareness

The training needs and action plan outline a structured, time-bound roadmap to strengthen awareness, outreach, and technical capacity across project blocks. By combining simplified IEC materials, targeted ToTs, improved community mobilisation, culturally sensitive approaches, and practical livelihood demonstrations, the plan ensures stronger participation especially among tribal women—and more effective delivery of government schemes and Green College Odisha interventions.

4.2.2 CSO Partners

CSO partners focus on community mobilization, inclusive participation, and livelihood-based training. They ensure local customization, hands-on learning, and capacity building in entrepreneurship and social empowerment, complementing government efforts at the grassroots level.

Table 36: Reported Challenges from CSO

Block	Reported Challenges	Response Strategy
Belpada	Low mobilisation; weak market links	IEC (Info, Edu, Communication) drives; quick capacity trainings; market tie-ups
Khaprakhol	Tough terrain; weak documentation	Cluster-wise outreach; simple MIS formats
Thakurmunda	Remote tribal areas; low digital use	Vernacular IEC; doorstep trainings
Kankadahad	High migration; weak SHGs	Seasonal activity planning; SHG strengthening
Bisamkatak	Low trust	Work via local leaders; safe cluster meetings
Kolnara	Scattered villages; low women participation	Cluster meetings; women-friendly timing
Baliguda	Forest-dependent; data gaps	Promote NTFP value-addition; regular MIS
Kantamal	Poor irrigation; climate risk	Micro-irrigation; climate-resilient demos
Banspal	Difficult access; low inclusion	Local facilitators; mobile extension
Harichandanpur	Weak coordination; poor monitoring	Monthly convergence meets; digital tracking
Semiliguda	Wage dependence; low savings	Livelihood diversification; SHG savings push
Borigumma	Migration; weak PG capacity	Pre-migration planning; PG business support
Lanjigarh	High expectations; land/forest issues	Clear project messaging; LRM(Land & Resource Management) facilitation
Khariar	Drought; weak water management	Water structures; WMC training
Laikera	Low capacity; poor documentation	Basic staff training; simple reporting tools

Across the project blocks, the analysis highlights a diverse set of operational and livelihood challenges that hinder effective mobilisation, market access, documentation, and climate-resilient farming. The block-specific solutions outlined in the table offer a practical framework for strengthening institutional capacity, improving service delivery, and ensuring that interventions are tailored to the local socio-economic and geographic context, thereby enhancing the overall effectiveness of the program.

Table 37: Capacity Building Gaps with practical solution

Block	Capacity Building Gaps	Practical Solutions
Belpada	Low awareness; weak mobilisation skills	Targeted IEC drives; hands-on mobilisation workshops
Khaprakhol	Weak record-keeping; limited facilitation skills	Simple MIS formats; field facilitation training modules
Thakurmunda	Low digital literacy; limited training exposure	Basic digital training; periodic skill-development camps
Kankadahad	Weak SHG governance; poor planning capacity	SHG leadership training; structured micro-planning
Bisamkatak	Low trust-building skills; security-sensitive areas	Community engagement training; safe cluster-based sessions
Kolnara	Weak convergence skills; low women participation techniques	Cross-department convergence workshops; gender-inclusive training
Baliguda	Poor data skills; limited NTFP/value-addition knowledge	Data collection orientation; NTFP processing demonstrations
Kantamal	Low climate-resilient technical knowledge	Training on micro-irrigation, soil moisture, resilient crops
Banspal	Limited facilitation in remote areas; low inclusion skills	Local facilitator training; inclusion-focused approaches
Harichandanpur	Weak coordination & reporting	Coordination workshops; simple reporting templates
Semiliguda	Low financial literacy; limited livelihood skills	SHG finance training; livelihood skill camps
Borigumma	Weak PG/SHG business management	Business planning, bookkeeping & market linkage training
Lanjigarh	Limited land/forest rights understanding	Training on FRA processes; support to FRC and PRI members
Khariar	Poor water management & climate knowledge	Training on water harvesting, WMC roles, climate practices
Laikera	Poor documentation; weak follow-up	Field documentation training; structured field review cycles

The capacity-building review highlights key gaps in mobilisation, documentation, digital skills, climate-smart practices, and livelihood management across blocks. The proposed solutions provide focused, practical training pathways to strengthen community institutions and improve field-level implementation. Together, these interventions create an enabling environment for improved governance, stronger farmer participation, and more effective implementation of Green College and APC initiatives across diverse field contexts.

Table 38: Summary Of TNA Matrix for all Stakeholder

Stakeholder Category	Role Level	Core Role & Influence	Key Capacity Gaps Identified	Priority Training Requirements	Preferred Pedagogy	Key Outcome Indicators
PG Members (Farmers)	Leading Individual / Self	Primary producers contributing to productivity, sustainability, and adoption of improved practices	Limited exposure to sustainable agriculture, soil testing, digital tools, record keeping, and market linkage	• SRI/SRP and climate-resilient practices • Soil testing literacy and balanced nutrient management • Sustainable/organic/NPM practices • Basic record keeping and collective marketing	Field demonstrations, peer learning, visual and audio-visual tools; seasonal delivery	Yield per acre, adoption of improved practices, income diversification
Agro-Ecopreneurs	Leading Operations	Initiate and manage agri-enterprises; provide services and market linkages	Weak market analysis, financial planning, branding, and digital entrepreneurship skills	• Business planning and costing • Value-chain and market analysis • Digital marketing and enterprise scaling	Workshops, mentoring, exposure visits, incubation support (3–6 months)	Enterprise profitability, market access, enterprise registration
PG Executives	Leading Organisation	Manage PG operations, coordination, and basic financial processes	Weak governance literacy, record maintenance, and digital skills	• Group governance and financial literacy • Record keeping and reporting • Inclusive decision-making	Participatory training, role-play, simple ICT tools; periodic	Meeting regularity, quality of records, member participation
PC Executives & Board Members	Leading Organisation	Oversee governance, procurement, sales, and strategic decisions	Limited understanding of cooperative governance, auditing, MIS, and business planning	• PC governance and compliance • Business planning and financial management • Digital MIS and buyer negotiation	Leadership workshops, simulations, ICT-based modules; quarterly	PC turnover, audit completion, governance effectiveness

Stakeholder Category	Role Level	Core Role & Influence	Key Capacity Gaps Identified	Priority Training Requirements	Preferred Pedagogy	Key Outcome Indicators
Frontline Functionaries (CRPs, Mitras)	Leading Operations	Provide extension, facilitate schemes, collect data, and train farmers	Gaps in ICT use, participatory facilitation, monitoring, and documentation	• Advanced extension and facilitation skills • Digital data reporting and MIS • Participatory communication	Blended learning (digital + field mentoring); biannual refreshers	PG members covered, data quality, technology adoption rates
Government Officials	Leading Organisation & Operations	Act as training partners, scheme facilitators, technical supervisors, and monitors of APC implementation at district and block levels	Limited exposure to integrated convergence planning, ICT-based monitoring, participatory extension planning, and feedback systems	• Inter-departmental convergence planning • ICT-enabled MIS and digital reporting • Participatory extension and adaptive leadership • Community feedback and grievance response mechanisms	Periodic workshops on convergence and MIS (6-monthly); refresher field training, simulations, and community interface modules	Coordination effectiveness, accuracy and timeliness of digital reporting, scheme convergence outcomes, farmer outreach coverage
CSO Partners	Leading Organisation & Operations	Mobilise communities, implement livelihood interventions, support PGs/PCs, and facilitate government linkages	Limited capacity in enterprise management, value-chain planning, ICT systems, and structured impact documentation	• Livelihood value-chain development • Business planning and enterprise facilitation • ICT-enabled monitoring and reporting • Participatory learning and documentation	Modular training on value chains and impact monitoring (biannual); field-based mentoring, exposure visits, and hands-on ICT sessions	Reporting timeliness, enterprise support outcomes, community participation rates, adoption of digital monitoring tools

Digital Platforms and Tools for PG member Capacity Building and Market Linkages

A structured list of digital channels that can be used to deliver “capacity-building training”, “increased awareness about sustainable agricultural practices”, and “provide market linkages” for selling agricultural produce.

Table 39: Digital Platform and Tools for Agriculture Capacity building And Market Linkages

Category	Platform / Channel	What the Platform Does	Evidence from Quantitative & Qualitative Assessment	Strengths	Limitations	Integration Relevance for APC 2.0 & Green College
Capacity-Building (Video & Visual Learning)	YouTube (KVKs, Agri Universities)	Hosts free videos on crops, soil, livestock, IPM, water management	FGDs show farmers recall practices better when visually demonstrated ; literacy constraints limit text-heavy learning	Visual, low-cost, reusable; supports demonstration-based learning	Content not block-specific; no interaction or tracking	Curated playlists linked to Green College curriculum; used as pre/post-demo reinforcement
	Digital Green App	Community-made videos in local language	Qualitative findings show peer learning and local examples improve adoption	Local language, relatable, proven in low-literacy contexts	Requires facilitation; limited enterprise content	Core Green College digital tool for demonstration-led learning
Structured e-Learning (Officials & CRPs)	DIKSHA (Agri modules)	Govt-certified training modules	KIIs indicate frontline workers need refresher and standardised content	Authoritative, scalable, structured	Not farmer-friendly; low awareness	Used for ToT and refresher training of CRPs & officials
	MANAGE e-Learning	FPO/PC management, agri-entrepreneurship	Quantitative data show <30% farmers linked to PCs , indicating weak institutional capacity	Strong enterprise & governance focus	English-heavy; limited farmer relevance	Targeted use for PG/PC leaders under Green College
Mobile Advisory Apps	Kisan Suvidha / Rythu Bharosa	Weather, pest, scheme advisories	Survey shows ~80% smartphone ownership , but uneven effective use	Real-time alerts; official data	Information overload; low interpretation	Integrated as advisory layer linked to trainings

Category	Platform / Channel	What the Platform Does	Evidence from Quantitative & Qualitative Assessment	Strengths	Limitations	Integration Relevance for APC 2.0 & Green College
	mKRISHI	Crop practice advisories	Farmers seek quick, actionable guidance	Simple interface	Advisory only; limited feedback	Supplementary advisory post-training
Low-Literacy & Outreach Tools	WhatsApp Groups	Share videos, voice notes, photos	FGDs show WhatsApp is most commonly used digital channel	High adoption; peer interaction	Content clutter; no analytics	Primary engagement & follow-up platform for Green College cohorts
	IVR / Voice Systems	Voice advisories in local language	Qualitative evidence highlights language barriers among tribal farmers	Accessible to non-literate farmers	Costly; limited depth	Used for seasonal alerts and critical messages
Sustainable Practice Awareness	Soil Health Card Portal	Soil diagnostics & recommendations	Quantitative finding: <25% farmers use soil test results	Data-backed recommendations	Low interpretation capacity	Used during soil health demonstrations and literacy sessions
	NMSA Portal	Climate-smart agriculture content	Supports CSA focus identified in TNA	Policy-aligned content	Not farmer-facing	Reference material for trainers
Market Linkages (Government)	e-NAM	Price discovery, inter-mandi trade	Quantitative data show >60% farmers depend on local traders	Transparent pricing; scale	Requires aggregation & digital skills	Key platform for PCs/FPOs with Green College support
	State e-Mandi Apps	Local mandi prices & auctions	FGDs highlight price discovery gaps	Local relevance	Fragmented by state	Used where APC blocks are operational
Market Linkages (Private)	DeHaat, Ninjacart, AgriBazaar, Bijak	B2B trading, logistics, aggregation	Qualitative findings show need for buyer coordination & reduced intermediaries	End-to-end solutions	Geography & volume thresholds	Piloted with selected PCs under Green College
Direct-to-Consumer (D2C)	WhatsApp Commerce	Local buyer sales	Small producers prefer trusted local buyers	Low cost; flexible	Limited scale	Short value chains for vegetables & perishables

Category	Platform / Channel	What the Platform Does	Evidence from Quantitative & Qualitative Assessment	Strengths	Limitations	Integration Relevance for APC 2.0 & Green College
	ONDC	Open digital commerce network	Aligns with long-term market access needs	Policy-supported; scalable	Early-stage adoption	Medium-term integration for mature PCs
State Schemes & Dept. Apps	State Agri / Horticulture / Veterinary Apps	Schemes, advisories, training notices	KIIs indicate low scheme awareness & convergence gaps	Context-specific	Fragmented platforms	Information backbone for Green College
Monitoring & MIS	OLM/ATMA MIS	Track beneficiaries, training, schemes	Review comments stress need for monitoring & follow-up	Structured tracking	Not learner-facing	Integrated Green College monitoring system

The assessment indicates that although multiple digital platforms and applications are available for agricultural training, advisory services, and market access, their utilisation at the farmer level remains fragmented. Key constraints include limited awareness, inadequate localisation of content, weak follow-up mechanisms, and the absence of an integrated approach linking capacity building with advisory and market functions. Under APC 2.0, the Green College is well positioned to serve as an enabling integrator by curating relevant digital content, contextualising advisories to local agro-ecological conditions, strengthening digital literacy among Producer Group members, and systematically linking training outputs with digital market platforms. A blended delivery model combining WhatsApp-based learning, community-generated videos, government advisory services, and digital marketplaces emerges as the most practical and inclusive pathway for enhancing skills, improving adoption of sustainable practices, and increasing income opportunities across APC clusters.

5 LIMITATION OF THE STUDY

The study faced certain limitations that may have influenced the depth and scope of analysis. Limited availability of disaggregated and updated data from some departments and institutions.

Accessibility challenges in remote and tribal areas restrict the extent of field coverage.

- **Data Availability Constraints:** Limited access to disaggregated and updated data from some departments and institutions restricted the granularity of secondary analysis.
- **Geographical and Accessibility Challenges:** Field coverage in remote, hilly, and tribal areas was constrained due to accessibility issues, which may have limited representation from some hard-to-reach communities.
- **Time Constraints during Fieldwork:** Restricted fieldwork duration reduced the depth of engagement with certain stakeholder groups, particularly for qualitative methods, thereby limiting the richness of contextual insights.
- **Seasonality Risk:** Ongoing agricultural operations during peak seasons affected farmers' availability, influencing response consistency and completeness. Seasonal variation may also have shaped perceptions related to income, labour availability, and input use at the time of survey administration.
- **Enumerator Bias:** Despite structured training and supervision, the possibility of enumerator bias cannot be fully ruled out, particularly in subjective or perception-based responses.
- **Attribution Challenges:** The presence of multiple concurrent government schemes made it difficult to fully isolate APC-specific effects, limiting precise attribution of observed outcomes to the project alone.
- **Data Consistency across Districts:** Variations in record-keeping practices and digital reporting systems across districts introduced inconsistencies, affecting cross-block comparability.
- **Gender-Disaggregated Data Limitations:** Limited availability of gender-disaggregated data constrained detailed analysis of women's participation, leadership, and decision-making roles.
- **Recall Bias in Self-reported Data:** Dependence on self-reported information may have introduced recall bias, particularly for income, input use, and practice adoption variables.
- **Constraints on Women's Participation:** The lack of dedicated and safe meeting spaces for women Producer Group (PG) members constrained comfort, attendance, and open participation. Meetings held in open or temporary spaces especially during adverse weather further reduced engagement and limited effective mobilization.

Way Forward for Improved Attribution: Future midline and endline evaluations, with panel tracking of the same households and repeated seasonal observations, will help address attribution challenges by capturing changes over time and controlling for seasonal and programme overlap effects. Strengthened administrative data integration and improved gender disaggregated reporting will further enhance analytical precision and causal inference.

6 CONCLUSION

This baseline study provides a robust reference point for the Green College Odisha Project, systematically assessing the socio-economic and livelihood conditions of PG members across targeted regions. It presents a clear picture of participants' preparedness in knowledge, skills, attitude, and capacity (P-K-S-A-C framework). The survey design employing a mixed-method approach, multi-stage sampling, and CAPI-based data collection along with careful triangulation, ensured the reliability of findings. The Propensity Score Matching analysis further established balance between APC and control groups, creating a sound foundation for future impact assessment (Mean gap reduced: 0.0954 → 0.0004).

The baseline findings clearly establish that the Green College Odisha Project has been strategically positioned in **tribal-dominated, high-deprivation rural geographies**, where agriculture remains the primary livelihood backbone and dependence on wage labor persists for income supplementation. By prioritizing Scheduled Tribes, women, and marginalized youth, the project demonstrates a **strong social inclusion agenda** aligned with BRLF's mission to enable resilient livelihoods in backward regions.

Capacity development interventions under APC have already contributed to noticeable improvements in:

- **Skill acquisition** in sustainable agriculture and livestock practices
- **Adoption of high-value crops, NPM, and improved irrigation practices**
- **Formation and mobilization of Producer Groups** and their linkages with PCs
- **Early-stage entrepreneurship** through Agri-Ecopreneurs and business advisory support.

Higher adoption levels among project farmers compared to control groups clearly indicate the effectiveness of structured training and localized extension systems. These adoption behaviors reflect improved **perception-knowledge-skill-attitude-action (P-K-S-A-C)** progression, demonstrating strong behavioral shift pathways already emerging in early stages.

However, several **systemic bottlenecks** continue to limit the speed and scale of livelihood transformation:

- Digital divide still restricts access to information, MIS use, and e-commerce
- PCs require continuous governance mentoring and access to working capital
- Water access and PHM infrastructure remain insufficient for scaling
- Business management and market negotiation capacities remain weak
- Women's leadership, despite higher participation, is still emerging

Frontline functionaries and government convergence structures are operational but need strengthened **technical competencies, communication tools, mobility support, and monitoring systems** to ensure last-mile service delivery. Overall, the baseline confirms **strong institutional readiness and PG member motivation** to leverage skill-based livelihood models.

The baseline serves as a robust benchmark against which **midline and endline** can measure:

- Increased income and enterprise stability
- Strengthened producer institutions
- Expanded market integration
- Digital transformation and climate-resilient farming

Thus, the Green College Odisha initiative is well-positioned to drive significant economic, environmental, and social outcomes in the subsequent phases.

Table 40: Evidence Based Training Matrix Aligned to Identified Capacity Gaps

Module No.	Training Module	Target Group	Key Sub-Modules / Topics	Quantitative Evidence (Survey-based)	Qualitative Evidence (FGDs / KIIs)	Identified Capacity Gap	Expected Training Outcome	Recommended Training Modality	Priority
1	Sustainable Agriculture & Agroecology	Farmers, CRPs, Master Trainers	SRI/SRP paddy; crop rotation; diversification; organic farming; NPM; IPM; climate-resilient practices	<50% farmers trained in advanced practices; low adoption of crop rotation & CSA	Partial understanding of organic/NPM; demand for demonstrations	Awareness without hands-on skills; weak follow-up	Higher adoption of sustainable practices; reduced input cost	Farmer Field Schools; plot demonstrations; season-long handholding	Very High
2	Soil Health & Nutrient Management	Farmers, PG members, CRPs	Soil testing literacy; soil card interpretation; composting; vermicomposting; green manuring; micronutrients	<25% practiced soil testing; poor yield-fertilizer linkage	Farmers unable to interpret soil reports; trainings seen as theoretical	Soil data not translated into farm decisions	Improved soil fertility management and productivity	Soil camps; compost pit demos; nutrient planning exercises	Very High
3	Water Management & Irrigation Efficiency	Farmers, PG leaders, CRPs	Micro-irrigation; rainwater harvesting; moisture conservation; crop-water budgeting	Avg. irrigated land only 0.6 acres; >75% rainfed	Water scarcity ranked top constraint	Low technical knowledge of irrigation options	Efficient water use and climate resilience	Demonstration units; convergence sessions; village water planning	High
4	Livestock Management & Allied Activities	Farmers, Agro-ecopreneurs, CRPs	Scientific rearing (cattle/goat/poultry); vaccination; disease control; fodder planning	Livestock ownership 3-4x higher; <30% trained	High mortality; reliance on traditional practices	Asset ownership without technical skills	Improved productivity and income buffering	Animal health camps; exposure visits; practical feeding models	High

Module No.	Training Module	Target Group	Key Sub-Modules / Topics	Quantitative Evidence (Survey-based)	Qualitative Evidence (FGDs / KIIs)	Identified Capacity Gap	Expected Training Outcome	Recommended Training Modality	Priority
5	Horticulture & Vegetable Production	Farmers, PGs, Agro-ecopreneurs	Nursery management; protected cultivation; seasonal planning; pest/disease control	Vegetables grown but low productivity	Poor nursery quality; high losses	Weak technical depth in horticulture	Increased yield and quality	Cluster-wise demos; nursery units; field practice	High
6	Market Linkage & Value Chain Development	Farmers, PGs, PCs, Agro-ecopreneurs	Market literacy; pricing; aggregation; buyer negotiation; value chains	High dependence on middlemen; low PC-led marketing	Price manipulation; transport constraints	Weak bargaining power	Improved price realization	Market simulations; buyer interactions; aggregation pilots	Very High
7	Enterprise Development & Agro-Ecopreneurship	Agro-ecopreneurs, Youth, PG/PC members	Business planning; costing; pricing; record-keeping; risk analysis	Limited profit tracking; informal enterprises	Lack of confidence to scale	Weak business & financial skills	Viable rural enterprises	Business clinics; mentoring; case-based learning	Very High
8	Post-Harvest Management & Value Addition	Farmers, Agro-ecopreneurs, PCs	Grading; storage; processing; packaging; quality standards	<25% trained in PHM	High post-harvest losses	Lack of PHM knowledge	Reduced losses; higher margins	Practical PHM demos; exposure visits	High
9	Institutional Strengthening – PGs	PG leaders, CRPs	Governance; meeting practices; records; financial literacy	90% PG membership but uneven performance	Weak documentation & planning	Low institutional maturity	Stronger PG governance	Role-based training; mock meetings	High
10	Institutional Strengthening – PCs	PC Board, Staff	Business planning; procurement; MIS; compliance; finance	Only ~30% farmers linked to PCs	Weak board oversight	Limited professional management	Sustainable PC operations	Board workshops; governance simulations	High

Module No.	Training Module	Target Group	Key Sub-Modules / Topics	Quantitative Evidence (Survey-based)	Qualitative Evidence (FGDs / KIIs)	Identified Capacity Gap	Expected Training Outcome	Recommended Training Modality	Priority
11	Digital Literacy & MIS	Farmers, CRPs, PG/PC staff	Smartphone use; advisory apps; MIS reporting	~13% APC households use basic phones	Low confidence in digital tools	Digital divide	Improved ICT adoption	Hands-on digital labs; peer learning	Medium
12	Gender & Youth Inclusion	Women farmers, Youth, CRPs	Leadership; enterprise roles; financial inclusion	Low women leadership despite high participation	Mobility & decision-making barriers	Social norms restrict participation	Enhanced inclusion & leadership	Participatory methods; women-led groups	High
13	Frontline Functionary Capacity Building	CRPs, Krushi/Prani/Udyog Mitras	Technical advisory; facilitation; documentation; monitoring	Inconsistent advisory quality	Need refresher & advanced training	Skill dilution over time	Improved last-mile service delivery	Refresher trainings; mentoring	High
14	Scheme Convergence & Policy Literacy	Farmers, PGs, PCs, CRPs	PMKSY, MIDH, NRLM, APICOL, ARD schemes	Low scheme uptake despite availability	Procedural complexity	Poor convergence awareness	Increased access to schemes	Convergence clinics; exposure sessions	Medium

7 RECOMMENDATIONS

The recommendations presented in this chapter are derived directly from patterns observed in the **quantitative baseline survey** and validated through **qualitative FGDs and KIIs**. Quantitative indicators highlighted **where adoption, performance, or participation remains weak**, while qualitative evidence explained **why these gaps persist despite earlier interventions**. For each stakeholder group, the top five learning needs were identified based on their **frequency across locations**, their **direct linkage to adoption, income, or institutional performance**, and their **amenability to improvement through structured capacity building**. These learning needs form the immediate basis for the recommendations proposed under the Green College model.

Farmers (Small, Marginal, and Tribal)

Baseline findings show that farmers remain highly dependent on agriculture, yet sustained adoption of improved practices remains limited. Although **over 70% of farmers reported having attended at least one training, less than 50% consistently apply improved agronomic, soil, or water management practices**. FGDs clarified that farmers struggle to convert advisory messages into field-level decisions, particularly under rainfed and low-input conditions. Market engagement is weak, with **around 60–65% of farmers selling primarily through local traders**, and limited understanding of quality standards or post-harvest requirements. In addition, **nearly one-third (≈30–35%) of respondents are illiterate**, constraining text-based learning.

Top learning needs identified from data:

- Practical adoption of **sustainable agriculture practices** (SRI/SRP, organic/NPM, soil and water management), given <50% consistent adoption.
- Ability to **interpret soil test results**, as fewer than **40% reported using soil test recommendations effectively**.
- **Water-use efficiency and climate-resilient practices**, with **over 70% cultivated area rainfed**.
- **Market literacy**, including price discovery, quality standards, and post-harvest handling, as **>60% depend on local traders**.
- Simple **production and sales record keeping**, reported by **less than 35–40% of farmers**.

These findings support a shift towards **demonstration-led, visual, and field-based learning**, combined with market and post-harvest exposure, rather than additional classroom training.

Agro-Ecopreneurs

The baseline indicates growing interest in agro-ecopreneurship, but most enterprises remain small and vulnerable. While **20–30% of surveyed households reported engagement in income-generating activities beyond primary farming**, only a small proportion operate at commercial scale. KIIs reveal gaps in **costing, pricing, and cash-flow management**, and FGDs show that **over 70% of agro-ecopreneurs rely on informal or local buyers** without negotiated contracts.

Top learning needs identified from data:

- **Enterprise planning, costing, and pricing**, as fewer than **30% could estimate profit margins accurately**.

- **Market linkage development and buyer negotiation**, given high dependence on informal markets.
- **Quality control, packaging, and branding**, particularly for mushroom, nursery, and livestock products.
- **Financial literacy and access to working capital**, cited as a constraint by **over 60% of agro-ecopreneurs**.
- Trade-specific technical refinement (mushroom, nursery, goatery, agri-input services).

This evidence justifies recommendations focused on **enterprise mentoring, incubation support, and market-facing capacity building**, rather than generic livelihood training.

Producer Group (PG) Members

Producer Group participation is high, with **over 90% (≈91.3%) of surveyed households affiliated with PGs**, indicating strong mobilisation. However, functional performance varies widely. FGDs reveal weaknesses in meeting quality, documentation, and financial discipline, while KIIs indicate that **less than 50% of PGs maintain regular records or updated financial books**.

Top learning needs identified from data:

- **Group governance and role clarity**, as inconsistent meeting practices were reported in **40–50% of PGs**.
- **Financial literacy and basic bookkeeping**, with record-keeping gaps in over half of PGs.
- **Collective input procurement and aggregation planning**, currently undertaken by **fewer than 40% of PGs**.
- **Scheme awareness and documentation**, with procedural knowledge uneven across villages.
- Coordination mechanisms with Producer Companies.

The findings support **practice-oriented governance training**, simple formats and tools, and strengthening of **PG–PC operational linkages**.

Producer Company (PC) Board Members and Staff

The data show that Producer Companies are at an early stage of institutional maturity. While PCs are formally constituted, KIIs indicate that **only 30–40% are actively engaged in structured procurement or sales operations**. Gaps are evident in accounting systems, compliance, and buyer engagement.

Top learning needs identified from data:

- **Business management and financial systems**, as fewer than **40% of PCs use standard accounting formats**.
- **Procurement planning and supply chain coordination**, limited to pilot or ad-hoc activities.
- **Quality control and buyer negotiation**, with most sales routed through intermediaries.
- **Statutory compliance and reporting**, identified as a challenge in a majority of PCs.
- Use of **digital MIS**, currently used effectively by **less than one-third of PCs**.

These findings directly inform recommendations for **governance mentoring, standardised business tools, and applied institutional learning**, rather than one-time leadership workshops.

Frontline Functionaries (CRPs, Krushi/Prani/Udyog Mitras)

Frontline functionaries are central to last-mile delivery, yet the assessment shows variability in technical accuracy and follow-up quality. KIIs indicate that **only around 50–60% of frontline staff feel confident in providing technical guidance without supervision**. Digital documentation and monitoring remain weak, with **less than 40% regularly using digital tools for reporting**.

Top learning needs identified from data:

- Updated **technical knowledge** on sustainable agriculture and livestock practices.
- **Facilitation and communication skills**, especially in tribal contexts.
- **Digital documentation and reporting**, given low regular usage (<40%).
- Understanding of **scheme convergence and referral mechanisms**.
- Monitoring adoption and outcomes at field level.

This evidence supports recommendations for **regular ToT and refresher training**, mobile-based checklists, and mentoring support.

Government Officials (Block and District Level)

Government officials demonstrate strong technical knowledge of schemes, but KIIs highlight weak last-mile communication and limited use of field-level data for decision-making. Officials rely heavily on frontline workers for mobilisation and monitoring, with **over 70% of officials indicating dependence on CRPs and Mitras for community engagement**.

Top learning needs identified from data:

- **Convergence planning** across agriculture, livestock, and market schemes.
- **Communication strategies** for tribal and remote communities.
- Use of **simple digital/MIS tools**, currently underutilised.
- Interpretation of field data for programme decisions.
- Coordination with CSOs and producer institutions.

This underpins recommendations on **cascade ToT models, communication toolkits, and simplified MIS use**.

CSO Partners

CSOs play a critical facilitation role, but the assessment identifies gaps in enterprise mentoring, market linkage facilitation, and systematic documentation. KIIs note that **only around 40–50% of CSOs have prior experience in enterprise or value chain support**, and documentation practices vary widely.

Top learning needs identified from data:

- Advanced **community facilitation methods**.
- **Enterprise mentoring and market linkage facilitation**.
- **Value chain understanding**, beyond mobilisation roles.
- **Evidence-based documentation and monitoring**.

- Coordination with government and producer institutions.

This supports recommendations to strengthen CSOs as **technical and mentoring partners**, not only mobilisation agents.

Strategic Recommendations for Strengthening the Green College Model:

Based on the baseline findings of the Green College Project in Odisha, several strategic recommendations have been outlined to strengthen farmer capacities, institutional systems, market integration, and program delivery. The evidence highlights early adoption of sustainable practices, high PG participation, emerging enterprise potential, and existing gaps in digital literacy, market readiness, and governance. To address these gaps and enhance the overall effectiveness of the Green College model, the following thematic recommendations are proposed across curriculum design, institutional strengthening, entrepreneurship development, digital integration, gender inclusion, monitoring systems, and field-level operational resilience.

Program & Curriculum Design

Baseline shows strong farmer dependence on agriculture and early adoption of sustainable practices but low digital skills and limited practical exposure

- Localize curriculum by agro-ecological zones, focusing on NPM, HVC, livestock intensification, PHM
- Ensure 70% practical-based learning – demo plots, model farms, exposure visits
- Short-term micro-courses for quick income (mushroom, nursery, goatery)
- Develop Odia + tribal language low-literacy IEC kits for women/tribal farmers

Institutional Strengthening & Governance

PG participation is high (91.3%) but PCs are early stage and need business support

- Quarterly Governance Mentoring Clinics for PC boards
- Standardized business plan templates, accounting formats and audit coaching
- Promote women and youth leadership pipelines in PC governance
- Strengthen PG–PC service contracts (input supply, aggregation rights)

Entrepreneurship & Market Linkages

AE pipelines exist but weak working capital and limited value chain integration

- Setup Green College Incubation Cells focused on mentoring, packaging, pricing
- Facilitate bank/Mission Shakti financing for AE working capital
- Incorporate digital marketing + branding modules
- Promote NTFP/livestock/horticulture-based microenterprises

Market & Value Chain Integration

Baseline shows low PHM access and low commercial scale despite HVC potential

- Block-level value chain action plans for ginger, goatery, vegetables, millets
- Establish village collection centers, grading units, mini-packhouses
- Farmer exposure to quality standards → better price realization
- Formal buyer–seller agreements with wholesalers/retailers

Digital Integration & MIS

Digital access is weak among farmers and frontline staff, affecting monitoring and markets

- Offline-enabled mobile advisory & MIS apps for PG/PC + farmers
- Mandatory smartphone training modules in all courses
- District WhatsApp advisory groups for daily decision support

Gender & Social Inclusion

Women participation high in PGs, but leadership & digital use remain low

- Reserve 50% seats for women in advanced modules
- Women-focused enterprise models (poultry, nursery, NTFP, processing)
- Gender-sensitive training timing, childcare, and female field trainers
- Track gender-segregated KPIs (income shift, leadership roles)

Monitoring, Evaluation & Learning

Baseline has established P-K-S-A-C as key metrics — needs to be institutionalized

- Quarterly Learning & Reflection Reviews with BRLF & PRADAN
- Adoption tracking for: soil health, NPM, market sales, irrigation use
- Develop success case libraries of early adopters and AEs

Capacity Building for CSOs & Field Staff

Frontline functionaries show medium technical skill, weak documentation and digital adoption

- ToT programs every quarter: communication + MIS + scheme linkage
- Provide mobile kits (audio-visual + IEC + MIS app)
- Incentivize performance-based adoption tracking

Risk Mitigation & Operational Resilience

Baseline highlights terrain, tribal remoteness, migration seasonality as challenges

- Prepare seasonal training calendars avoiding migration months
- Implement cluster micro-centers for remote habitations
- Backup offline survey/reporting systems during connectivity failures
- Safety protocols for travel and forest zones

Establish Women-Friendly Meeting and Training Spaces

A significant proportion of farmers expressed the need for fixed, dedicated structures for training and meetings. Given that nearly one-third of the participants are illiterate, many also emphasised the preference for visual and video-based training modules, which require appropriate infrastructure and screen-based facilities

- Build dedicated, safe training spaces for women PG members.
- Construct weather-resistant community structures to ensure uninterrupted sessions.
- Equip spaces with seating, lighting, sanitation, and audio-visual training facilities.
- Engage local institutions (GPs, SHGs, CSOs) to maintain and manage these structure.

Secondary Research: Curriculum Design and Learning Pedagogies

Secondary research strongly reinforces the findings. Adult learning theory emphasises that learners acquire skills more effectively when learning is **problem-centred, experiential, and immediately applicable**. Agricultural extension literature demonstrates that **demonstration plots and Farmer Field School approaches** significantly improve adoption of sustainable practices. Research in tribal and low-literacy contexts highlights the effectiveness of **visual, peer-led, and local-language learning**, while gender studies underline the importance of **trusted facilitators, flexible timing, and safe learning spaces**. Institutional capacity literature shows that **case-based learning and mentoring** outperform one-time trainings, and digital agriculture research cautions that digital tools are most effective when **embedded within extension and market systems**.

Table 41: Stakeholder-wise Learning Needs and Pedagogical Alignment

Stakeholder Group	Learning Needs Identified	Pedagogy Supported by Evidence
Farmers	Adoption of agronomy, soil, water practices	Demonstration-based, experiential learning
Agro-Ecopreneurs	Enterprise viability, pricing, market linkage	Problem-based, mentoring-led learning
PG Members	Governance, records, scheme processes	Practice-oriented, repeated application
PC Board & Staff	Business systems, compliance, supply chains	Case-based learning and mentoring
Frontline Staff	Technical accuracy, documentation	Refresher training and digital reinforcement
Government Officials	Convergence and mobilisation	Cascade ToT and communication pedagogy
Women Farmers	Leadership, enterprise, digital confidence	Peer-led, safe-space, flexible learning

Annexure

8.1 Annexure I: Complete table of Indicators related study for Green College Project

Indicator	Target Group	Unit/ Description	Findings / Value	Data Source / Remarks
No. of context-specific training modules developed for: (a) agroecology, (b) livestock, (c) food processing, (d) digital literacy, (e) value-addition	Farmers, CRPs, Ecopreneurs	Number of Modules/Curricula	10	Modular curricula including business planning and NPM.
No. of institutional partnerships established for training and resource access	Farmers, CRPs, PGs/PCs, Ecopreneurs	Number	12	Partnerships with KVKs, ICAR centres, 4 NGOs and 3 state departments.
% of farmers and ecopreneurs accessing inputs (e.g., bio-pesticides, seeds) through institutional collaborations	Farmers, Ecopreneurs	Percentage	48%	Survey and distribution records: seeds, bio-inputs provided via partners.
No. of joint initiatives with institutions for PGS certification and sustainable practice adoption	Producer Companies (PCs), Farmers	Number	6	Joint PGS drives, trainings and organic cluster formation.
Amount of funds leveraged from government schemes for PGs/PCs	Government, PGs/PCs	In Lakhs	42.5	Funds mobilized from NRLM, MIDH and state horticulture schemes.
No. of awards received for inclusive and sustainable project governance	Project	Number	3	Regional recognition for gender inclusion and sustainable practices.
% of farmers accessing training on high-value crop cultivation	Farmers	Percentage	63%	Attendance records from high-value crop modules.

Indicator	Target Group	Unit/ Description	Findings / Value	Data Source / Remarks
% of CRPs accessing training on NPM, SIFS, micro-irrigation, and digital tools	CRPs	Percentage	72%	CRP training logs and certificates.
% of women and marginalized farmers accessing digital literacy training	Women, Marginalized Farmers	Percentage	38%	Gender-disaggregated attendance records.
No. of farmers accessing bio-resource centers for inputs and training	Farmers, Households	Number	1240	Cumulative PG members from resource center registers.
% of ecopreneurs accessing training on business plan development and market strategies	Ecopreneurs	Percentage	62%	Entrepreneurship training attendance.
No. of PGs/PCs accessing credit via government or institutional schemes	PGs, PCs	Number	14	Credit linkages and sanction letters recorded.
% of farmers with access to smartphones and internet for digital tools	Farmers, Ecopreneurs	Percentage	Device ownership - 92% / Internet user - 78%	Device ownership and active internet usage surveys.
% of trained CRPs/farmers applying NPM practices within 6 months	CRPs, Farmers	Percentage	57%	Follow-up adoption surveys
% of farmers applying high-value crop cultivation techniques	Farmers	Percentage	46%	Adoption tracking through field visits.
% of ecopreneurs applying value-addition and market analysis skills	Ecopreneurs	Percentage	51%	Business follow-up assessments.
% of Master Trainers scoring $\geq 80\%$ in post-training	Master Trainers	Percentage	84%	Training evaluation scores.

Indicator	Target Group	Unit/ Description	Findings / Value	Data Source / Remarks
technical assessments				
% of CRPs using digital tools (e.g., apps, MIS) for crop advisories	CRPs	Percentage	69%	MIS usage logs and reports.
% of PG/PC leaders demonstrating improved business management skills	PG/PC Leaders	Percentage	58%	Performance review and meeting minutes.
% of farmers adopting micro-irrigation practices post-training	Farmers	Percentage	41%	Post-training monitoring and subsidy uptake.
% reduction in training gaps identified in annual assessments	CRPs, Farmers	Percentage	28%	Baseline vs. follow-up skill gap analysis.
% of PCs with PGS certification for organic production	Producer Companies (PCs)	Percentage	22%	Certification records from PGS registries.
% of farmers reporting sustained income increase from training (≥6 months)	Farmers	Percentage	54%	Income tracking surveys indicating sustained increases.
% of women-led PGs/PCs achieving documented business plans	Women-led PGs/PCs	Percentage	36%	Plan submission and documentation review.
No. of peer-to-peer learning networks formed post-training	Farmers, CRPs	Number	18	Registered peer groups and learning circles.
% of Master Trainers using interactive tools (PRA, role-plays)	Master Trainers	Percentage	77%	Training delivery observations.
No. of bio-resource centers established for sustainable inputs	Farmers, CRPs	Number	5	Centres established at block level with seed and compost stocks.
% of farmers adopting ≥1 sustainable practice	Farmers	Percentage	63%	Adoption surveys showing at least

Indicator	Target Group	Unit/ Description	Findings / Value	Data Source / Remarks
(e.g., NPM, soil health)				one sustainable practice.
No. of farms adopting CRP-recommended practices (e.g., crop diversification, bio-pesticides)	Farmers	Number	320	Field monitoring records across clusters.
No. of demo units replicated by trainees	Farmers, CRPs	Number	42	Replication of demo plots and farmer-hosted sites.
No. of water-saving structures (e.g., micro-irrigation) replicated	Farmers	Number	58	Installation records and subsidy utilization.
Reduction in chemical input use (kg/ha) in PGS clusters	Farmers	Kilograms per Hectare	12 kg/ha	Comparative input usage data pre/post intervention.
% of farmers adopting integrated livestock rearing practices	Farmers	Percentage	48%	Adoption tracking via household surveys.
No. of acres under high-value crop cultivation	Farmers	Number	185 acres	Area aggregation from PG member plots.
% of farmers/ecopreneurs using MIS platform for advisories, input sourcing, fund tracking	Farmers, Ecopreneurs	Percentage	44%	Platform user logs and registrations.
% of farmers using apps for real-time weather/market advisories	Farmers	Percentage	39%	App usage and survey data.
% of CRPs using collaborative digital tools (e.g., WhatsApp) for business processes	CRPs	Percentage	71%	Group activity logs.
No. of Agri-Entrepreneurs groomed	Agri-Entrepreneurs	Number	46	Entrepreneurship cohort graduated from the program.

Indicator	Target Group	Unit/ Description	Findings / Value	Data Source / Remarks
% of ecopreneurs accessing e-commerce platforms for market linkages	Ecopreneurs	Percentage	8%	E-commerce seller records and surveys.
% of PCs with diversified buyer portfolios (≥3 channels)	Producer Companies (PCs)	Percentage	33%	Buyer contracts and sales records.
% increase in average income of PC members from market linkages (Baseline: ₹5,112/month)	PC Members	Percentage	38%	Income surveys comparing baseline and current.
Total turnover of PCs through collective marketing	Producer Companies (PCs)	In Lakhs	78.4	Annual turnover aggregated from PC accounts.
No. of post-harvest management structures established	Farmers, PGs	Number	24	Storage/packhouse and small processing units established.
% of produce sold through collective marketing	Farmers, PCs	Percentage	29%	Sales logs showing collective marketing share.
% of ecopreneurs with registered businesses using digital tools	Ecopreneurs	Percentage	54%	Business registration and digital tool adoption.
No. of PGs certified as producer groups	Producer Groups (PGs)	Number	11	PG registrations and certification records.
% of PCs with elected boards and documented business plans	Producer Companies (PCs)	Percentage	68%	Governance documents and board records.
No. of PGs/PCs accessing institutional credit	PGs, PCs	Number	14	Credit access records (repeat of earlier for consistency).
% of PC boards holding quarterly meetings with action plans	PC Boards	Percentage	62%	Meeting minutes and action plan evidence.

Indicator	Target Group	Unit/ Description	Findings / Value	Data Source / Remarks
No. of leaders mentoring ≥5 peers/farmers	PG/PC Leaders	Number	27	Mentorship logs and peer referrals.
% of women farmers accessing schemes via CRPs	Women Farmers	Percentage	44%	Scheme access records and CRP facilitation logs.
% of women in leadership roles (master trainers, FPC boards, CRPs)	Women Farmers, Youth	Percentage	31%	Role-based participation records.
No. of women-led collectives accessing institutional credit	Women-led Collectives	Number	6	Credit sanction records for women-led groups.
% of marginalized caste/ethnicity members in PC leadership	Marginalized Groups	Percentage	29%	Leadership rosters and member profiles.
% of farmers from tribal regions engaged in training and market linkages	Farmers	Percentage	36%	Training attendance and linkage logs for tribal districts.
No. of Prani Mitra trained in livestock management	Prani Mitra	Number	18	Prani Mitra cadre trained under the livestock module.
No. of Krushi Mitra trained in sustainable crop practices	Krushi Mitra	Number	20	Krushi Mitra trained in NPM and SIFS methods.
No. of Udyog Mitra trained in value-addition and market strategies	Udyog Mitra	Number	15	Udyog Mitra trained for value-addition enterprises.
No. of visitors to demonstration units adopting sustainable practices	Farmers, Ecopreneurs	Number	210	Demo visitors tracked; adoption follow-ups show uptake.

8.2 Annexure II: Sampling Frame: District wise stakeholders Coverage

Stakeholders	CSOs	PC Board Member	PC Executive	PG Executive	CRPs	Frontline functionaries	Govt. officials	Agri– Ecopreneur	FGD (PG member)
Similiguda	1	1	1	1	1	2	2	3	1
Boriguma	1	1	1	1	1	2	2	3	1
Lanjigarh	1	1	1	1	1	2	2	3	1
Khariar	1	1	1	1	1	2	1	3	1
Laikera	1	1	1	1	1	2	2	3	1
Belpara	1	1	1	1	1	2	1	3	1
Khaprakhol	1	1	1	1	1	2	2	3	1
Thakurmunda	1	1	1	1	1	2	2	3	1
Kankahada	1	1	1	1	1	2	2	3	1
Bisamkatak	1	1	1	1	1	2	2	3	1
Kolnara	1	1	1	1	1	2	2	3	1
Baliguda	1	1	1	1	1	2	2	3	1
Kantamal	1	1	1	1	1	2	2	3	1
Bansapal	1	1	1	1	1	2	2	4	1
Harichandanpur	1	1	1	1	1	2	2	3	1

8.3 Annexure III: Crop-wise Seasonality, Production Capacity, and Cluster Relevance

Vegetable	Avg. Area (Acre)	Avg. Production (kg)	Avg. Farm Gate Price (₹/kg)	Primary Season	Typical Cluster*	Production Capacity Implication
Beans	0.4	252	38	Rabi / Summer	Inland vegetable clusters	Small-scale, quick-return crop suitable for homestead and short-cycle production
Bitter Gourd	0.4	210	37.5	Summer	Inland & peri-urban clusters	Limited volume, high-value seasonal diversification
Brinjal	0.8	2,315	30	Kharif–Rabi	Peri-urban market-linked clusters	High and steady production; suitable for regular market supply
Cabbage	0.6	1,300	32	Rabi	Highland & plateau clusters	Bulk production potential; suited for aggregation
Cauliflower	0.6	600	40	Rabi	Highland clusters	Medium volume, higher price; requires cold-season planning
Chilli (Green)	0.52	990	78	Kharif / Summer	Market-oriented clusters	High-value crop with strong income potential
Ginger	0.7	822	57	Kharif (long duration)	Tribal highland clusters	High-cost, high-value enterprise crop
Ladyfinger	0.6	567	33	Summer	Inland clusters	Short-duration crop, suitable for staggered harvesting
Onion	0.8	832	25	Rabi	Inland & storage-linked clusters	Price-sensitive crop; requires market timing
Pointed Gourd	1	2,750	47	Summer / Perennial	Riverine & irrigated clusters	High productivity; strong aggregation potential
Potato	0.6	1,674	18	Rabi	Highland clusters	High volume but low price; margin depends on cost control
Pumpkin	3.75	1,275	23	Kharif / Summer	Rainfed clusters	Large area, moderate returns; suitable for risk diversification
Spinach	0.2	150	20	All seasons	Homestead clusters	Low input, nutrition-oriented crop

Spine Gourd	0.4	475	38	Summer	Tribal clusters	Niche crop with good local demand
Tomato	1.7	4,745	33	Kharif–Rabi	Peri-urban & aggregation clusters	Very high production; sensitive to price fluctuations

8.4 Annexure IV: Farmer and KIs questionnaire

Questionnaire for Participating Farmers Baseline study for the Project "Green College Odisha: Creating Green Value Webs for Tribal Women Farmers"

Enumerator Detail

Name	
Phone number	
Education level	

Briefing to the Farmer and Proceed after his/her Consent

- ☐ This survey is a part of BRLF project to map the current capacity of different stakeholders to effectively implement Green College Odisha project with the aim to enhance sustainable livelihoods of tribal women in selected blocks of Odisha state.
- ☐ I would like to reassure you that the information you provide will be strictly confidential and used only for research purposes. Your participation is voluntary. There are no right or wrong answers, and your responses will not be attributed to you individually but pooled with other participants' responses to give aggregated insights. For quality control and training purposes, this interview may be monitored or recorded.
- ☐ You have option to withdraw from participation without any repercussions
- ☐ Do you consent to participate in the study? if yes, then proceed?
- ☐ You will also be engaged in the subsequent evaluation exercises, including participation in the midline and endline surveys

General Information

1. Name of respondent				
2. Location of the respondent	States Name	District Name	Block Name	Village Name
3. Social category	☐ General ☐ SC ☐ ST ☐ OBC ☐ Other, specify			
4. Mobile Number				
5. Age (in Years)				
6. Gender	☐ Male ☐ Female			
7. Educational Status	☐ Illiterate ☐ Primary ☐ Secondary ☐ Higher Secondary ☐ Graduation and above			
8. Please provide details of household members.	Member	Less than or equal to 18	Above 18	Total

	Male			
	Female			
9. What is your income source of livelihood?	Source	Primary(1)	Secondary(2)	
	☐ Crop Farming			
	☐ Livestock			
	☐ Wage (farm) laborer			
	☐ Employment			
	☐ Other specify			
10. Are you a participant of BRLF/PRADHAN project?	☐ Yes ☐ No			
11. Are you a member of any group/ committee/ Society	☐ PG (Producer Group) ☐ PC (Producer Company) ☐ SHG (Self-Help Group) ☐ None ☐ Other than specify			
11.1. If Yes, then post details	☐ Member ☐ Executive Member ☐ Board Member			

12. Detail	Area (Acre)
Land	Own:
	Leased in:
	Leased out:
	Total:
Cultivated land	
Irrigated land	
Rainfed land	

Sl. No.	Major crop name (Kharif)	Area (Acre)	Total Production (kg)	Straw yield (kg)	Cost of cultivation (Rs. per acre)	Quantity sold (kg)	Price (INR/kg)
1							
2							
3							

Sl. No.	Major crop name (Rabi)	Area (Acre)	Total Production (kg)	Straw yield (kg)	Cost of cultivation (Rs. per acre)	Quantity sold (kg)	Price (INR/kg)
1							
2							
3							

Sl. No.	Major Summer Crop name	Area (Acre)	Total Production (kg)	Straw yield (kg)	Cost of cultivation (Rs. per acre)	Quantity sold (kg)	Price (INR/kg)
1							
2							
3							

13. Livestock Assets	If Yes, number
☐ Cow ☐ Buffalow ☐ Goat/Sheep ☐ Pig ☐ Poultry	

Knowledge & Perception

14. Do you know about sustainable practices? (Multiple choice)	☐ NPM/IPM ☐ Line sowing/SRI ☐ Drip/Micro-irrigation ☐ Integrated livestock rearing ☐ Organic farming/PGS certification ☐ Don't know
15. What benefit do you associate with these practices?	☐ Higher yield ☐ Lower costs ☐ Better soil & water health ☐ Higher market price ☐ Don't know
16. Do you think integrating livestock with farming improves income and soil fertility?	☐ Yes ☐ No ☐ Not sure
17. What benefits do you associate with improved livestock management?	☐ Higher milk/meat yield ☐ Increased household income ☐ Manure for soil fertility ☐ Risk reduction (alternative income) ☐ None
18. Do you believe soil testing is necessary for better crop productivity?	☐ Yes ☐ No ☐ Not sure
19. What practices do you think improve soil fertility?	☐ Use of manure/compost ☐ Crop rotation/green manures ☐ Reduced chemical use ☐ Don't know
20. Do you think efficient water use (drip/sprinkler/mulching) improves productivity?	☐ Yes ☐ No ☐ Not sure
21. What are the biggest challenges in water use for farming?	☐ Water scarcity ☐ High cost of irrigation ☐ Inefficient irrigation methods ☐ Don't know

Training and Capacity Building

22. Who provided you training in the past?	☐ Government extension officer / KVK ☐ NGO / Project staff ☐ Farmer Producer Company (FPC) / Cooperative ☐ BRLF Green College trainer / CRP ☐ Fellow farmers / Peer learning ☐ Private company / Input dealer ☐ Others (please specify):
23. Which training programs you have attended during last one year?	☐ Agriculture ☐ High-value crops ☐ Improved crop production practices (seed treatment, line sowing, SRI method) ☐ Crop diversification ☐ Crop rotation (e.g., cereals followed by pulses) ☐ Cover cropping (e.g., planting green manure crops like sun hemp) ☐ sustainable/Climate-smart farming ☐ Plantation and Orchards ☐ Exposure visits/demonstration-based learning ☐ Organic/Natural farming practices ☐ Farm mechanization ☐ Post-harvest management ☐ Nursery Management ☐ Value addition and food processing ☐ Agri Input-Output Business ☐ Mushroom Cultivation ☐ Soil Health ☐ Organic/NPM farming ☐ Bio- pesticides/fertilizer ☐ Application of cow dung or farmyard manure or compost or bio char or other carbon-rich materials in soil ☐ Use of soil test based chemical fertilizers (e.g. NPK, micro nutrients) ☐ Minimum tillage or no-tillage methods ☐ Mulching (using straw/leaves/plant waste to cover soil) ☐ Use of Bio-fertilizer ☐ Safe and judicious use of chemical fertilizers/pesticides ☐ Other (please specify) ☐ Water Management ☐ Efficient irrigation methods (drip, sprinkler, micro-irrigation) ☐ Rainwater harvesting and farm pond construction ☐ Groundwater recharge techniques ☐ Canal/command area water management ☐ Integrated water and nutrient management ☐ Reuse of greywater and wastewater in agriculture

	☐ Community-based irrigation management (shared borewells/pipes) ☐ Water budgeting and scheduling of irrigation ☐ Animal Husbandry ☐ Improved breeding practices (Artificial Insemination, use of improved breeds) ☐ Livestock housing and shed management (low-cost housing, hygiene, ventilation) ☐ Balanced feeding, fodder cultivation, and silage preparation ☐ Use of crop residues and farm by-products for animal feed ☐ Animal health management (vaccination, deworming, first aid) ☐ Disease prevention and control (FMD, HS, PPR, poultry diseases) ☐ Dairy management (milking hygiene, milk handling, storage, value addition) ☐ Goat and sheep rearing practices (breeding, housing, marketing) ☐ Poultry rearing (backyard, improved breeds, feed management) ☐ Integrated livestock-crop farming for manure and soil fertility ☐ Value addition in livestock products (milk products, meat processing, poultry products) ☐ Market linkages and collective marketing of livestock produce ☐ Insurance and credit linkages for livestock ☐ Others ☐ Use of mobile/internet for farming ☐ Selling/marketing of produce ☐ Value addition and food processing ☐ Financial literacy ☐ Entrepreneurship and business planning ☐ Formation/strengthening of Farmer Producer Groups/SHGs/FPOs ☐ Gender and youth empowerment in agriculture ☐ Exposure visits/demonstration-based learning ☐ Other, specify
24. How satisfied with the training	☐ High ☐ Medium ☐ Low ☐ Not satisfied
25. Did you face any problem in attending training?	☐ Distance ☐ Cost ☐ Language ☐ Time ☐ No problems

Access to Farm Inputs and Services

26. Where do you usually get farm inputs? (multiple response)	☐ FPO ☐ PG/PC ☐ SHG ☐ Fellow Farmers ☐ NGO ☐ Govt. Department/KVK ☐ Input Dealer/Private Agent ☐ Others (Specify)
26.1 If selected FPO or SHG (multiple response)	☐ Seed ☐ Fertilizer ☐ Pesticides ☐ Animal feed ☐ Farm tools/machinery ☐ Vaccines/medicines ☐ Others (specify):
26.2 If selected PG/PC (multiple response)	☐ Seed ☐ Fertilizer ☐ Pesticides ☐ Animal feed ☐ Farm tools/machinery ☐ Vaccines/medicines ☐ Breeding services (AI, improved breeds) ☐ Others (specify): _____
26.3 If selected NGO/Development Project (multiple response)	☐ Seed ☐ Bio-fertilizers/Bio-pesticides ☐ Organic inputs/compost ☐ Vaccines/medicines ☐ Training & demonstrations ☐ Animal feed supplements ☐ Small equipment support ☐ Others (specify):
26.4 If selected Government Department/KVK (multiple response)	☐ Seed (foundation/minikit) ☐ Fertilizer subsidy ☐ Pesticides for demonstrations ☐ Soil health cards / soil testing services ☐ Animal vaccines & medicines ☐ Breeding services (AI, improved breeds) ☐ Others (specify)
26.5 If selected Input Dealer/Private Agent (multiple response)	☐ Seed ☐ Fertilizer ☐ Pesticides ☐ Animal feed ☐ Veterinary medicines ☐ Farm machinery on hire/EMI ☐ Others (specify):
26.6 If selected Fellow Farmers / Community Exchange (multiple response)	☐ Seed (local/traditional) ☐ Manure/organic inputs ☐ Animal feed/forage ☐ Shared tools/equipment ☐ Others (specify):
27. Do you know, where is the nearest Bio-Resource Center?	☐ Yes ☐ No

Adoption

28. Which agricultural practices do you currently adopt on your farm? (Multiple select)	☐ Micro-irrigation (drip/sprinkler) ☐ High-value crop cultivation (vegetables/fruits/spices/flowers) ☐ Seed treatment before sowing ☐ Crop diversification / rotation ☐ NPM (Non-Pesticide Management) ☐ Integrated livestock rearing (dairy/goat/poultry with farming) ☐ Organic / natural farming methods ☐ None
28.1 If Yes, specify crop name	

29. Has your farm soil been tested in the last 5 years?	☐ Yes ☐ No
30. If yes, who conducted the soil test? (If 29, answer is Yes)	☐ Government agency ☐ NGO/project staff ☐ Private lab
31. Have you noticed any changes in soil quality or crop productivity over the past 5 years? (If 29, answer is Yes)	☐ Improved ☐ No change ☐ Deteriorated
32. If you do not use Soil Health Card recommendations, how do you decide fertilizer use? (If 29. Answer is No)	☐ Own experience/traditional knowledge ☐ Input dealer / shopkeeper ☐ Neighbour / other farmers ☐ Government extension officer ☐ NGO/project staff
33. How important are chemical fertilizers/pesticides for achieving higher yields in your view?	☐ Very important ☐ Important ☐ Neutral ☐ Less important ☐ Not important
34. Are you aware of the recommended doses and safe use of chemical fertilizers/pesticides?	☐ Yes ☐ No
35. Do you know about the environmental and health impacts of excessive chemical use?	☐ Yes ☐ No
36. How frequently do you apply chemical fertilizers/pesticides?	☐ Rarely ☐ Sometimes ☐ Often ☐ Always
37. What percentage of chemical fertilizer reduction have you implemented on your farm?	☐ Less than 25% ☐ 25–50% ☐ 51–75% ☐ 76% and above
38. What percentage of chemical pesticide reduction have you implemented on your farm?	☐ Less than 25% ☐ 25–50% ☐ 51–75% ☐ 76% and above
39. Can you prepare and use organic inputs effectively?	☐ Yes ☐ No
40. Which organic inputs do you currently use? (Multiple select)	☐ Compost ☐ Vermicompost

	☐ Biofertilizers ☐ Botanical / organic pesticides ☐ Other (please specify): _____
40.1 if Yes, then what	☐ Limited Availability of Quality Inputs ☐ High Cost and Affordability Issues ☐ Supply Chain Gaps ☐ Awareness and Knowledge Gaps ☐ Low Local Production Capacity ☐ Storage and Shelf-life Issues ☐ Policy and Certification Barriers ☐ Market Linkage Uncertainty ☐ Behavioral Resistance ☐ Other, specify
41. Do you face challenges in sourcing organic inputs?	☐ Yes ☐ No
42. Are you able to sell your organic produce at a premium price?	☐ Yes ☐ No
43. Which water-saving practices do you currently adopt? (Multiple select)	☐ Drip irrigation ☐ Sprinkler irrigation ☐ Mulching ☐ Water harvesting structures (farm ponds, bunds, etc.) ☐ None
44. Do you practice irrigation scheduling (based on crop stage / soil moisture)?	☐ Yes ☐ No
45. What are the main problems you face in water management? (Multiple select)	☐ High irrigation cost ☐ Irregular rainfall ☐ Lack of irrigation equipment ☐ Poor water storage ☐ Other (please specify)
46. Do you currently keep livestock along with farming (mixed farming system)?	☐ Yes ☐ No
47. Which improved livestock management practices do you currently adopt? (Multiple select)	☐ Vaccination of animals ☐ Balanced feeding / fodder management ☐ Housing improvements (ventilation, hygiene, low-cost sheds) ☐ Breeding techniques (AI, improved breeds) ☐ Other (please specify)
48. Have you faced any animal health issues in the last year?	☐ Yes ☐ No If yes, please specify

49. What challenges do you face in livestock rearing? (Multiple select)	☐ Disease outbreak ☐ High feed cost ☐ Lack of veterinary support ☐ Poor breeds ☐ Market issues ☐ Other (please specify):
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Attitude

50. What is your plan for this season regarding the new practice?	☐ Will not try ☐ Try on a small patch ☐ Try on the full plot ☐ Continue and improve
51. What is your main motivation for adopting this practice?	☐ Increase income ☐ Ensure yield stability ☐ Reduce risk ☐ Improve soil health ☐ Save water ☐ Achieve quality premium ☐ Other (please specify):
52. What is your main concern about adopting this practice?	☐ Cost ☐ Time or labor required ☐ Water or power availability ☐ Buyer or price uncertainty ☐ Lack of family support ☐ Not confident to try ☐ No concerns ☐ Other (please specify):
53. Will you share or teach this practice to your group or neighbours?	☐ Yes ☐ No

Capability to Act

54. Do you have, or can you quickly arrange, the necessary inputs or tools for?	Crop Farming practice ☐ Yes ☐ No Animal Husbandry practices ☐ Yes ☐ No
55. If funds are required, what is your likely source of credit?	☐ No need for credit ☐ Have cash ☐ Family ☐ Producer Company (PC) ☐ Self-Help Group (SHG) ☐ Bank ☐ Microfinance Institution (MFI) ☐ Other (please specify): _____
56. Is water or power adequate for crop farming or animal	☐ Yes ☐ No ☐ Not applicable

husbandry practices, if required?		
57. Who is the main buyer or channel for your produce?	☐ Producer Company (PC) ☐ Local trader ☐ Processor ☐ Retailer ☐ Self-consumption ☐ None yet	
58. What is your phone/access status?	☐ Smartphone with data ☐ Basic phone ☐ No phone	
59. From which digital or online sources do you usually get advice about farming practices?	☐ WhatsApp group ☐ Mobile app or MIS platform ☐ YouTube / Online videos ☐ Social media (Facebook, Telegram, Instagram, etc.) ☐ Online forums / Farmer networks ☐ None	
60. What kind of farming information do you usually access through mobile? (Multiple select)	☐ Weather forecast (rainfall, temperature, etc.) ☐ Market prices of crops/livestock ☐ Government schemes/subsidy information ☐ Pest and disease control advisories ☐ Training videos / expert talks ☐ Input availability (seed, fertilizer, feed, etc.) ☐ Others (specify)	
61. Have you/your family accessed any govt scheme or subsidy through CRP/PC in the last year?	☐ Yes ☐ No	
62. After adopting training /practices, What changes have you observed in your productivity and income over the last 6 months?	i. Crop production	☐ Increased ☐ Stable ☐ Decreased
	ii. Livestock production	☐ Increased ☐ Stable ☐ Decreased
	iii. Income from crop	☐ Increased ☐ Stable ☐ Decreased
	iv. Income from livestock	☐ Increased ☐ Stable ☐ Decreased
	v. Income from other source	☐ Increased ☐ Stable ☐ Decreased
63. What activity/practice contributed most to the increase in income?	☐ High-value crops ☐ Livestock integration ☐ Organic practices ☐ Value addition ☐ Market linkage ☐ Others:	

Market linkages

64. Access to credit:	☐ Bank ☐ MFI ☐ SHG ☐ No
65. Access to buyers/collection centers:	☐ Yes ☐ No
66. Did you sell your produce through collective marketing in the last season?	☐ Yes, all produce ☐ Yes, partly ☐ No If Yes, then what (%)
67. Which channel do you use most for selling produce?	☐ Local market ☐ Middleman/trader ☐ PG/PC collective ☐ Directly to consumers (e.g., doorstep, farmgate) ☐ Government procurement centers (e.g., PACS, mandi) ☐ Online platforms or agri apps (e.g., eNAM, AgriBazaar) ☐ Value chain/processing units (food processing companies, dairy, etc.) ☐ Export channels ☐ Other

Social Inclusion

68. Are women in your household involved in farming decisions?	☐ Yes, actively ☐ Yes, partly ☐ No
69. Are women/youth in your household part of leadership roles (SHG, PG, PC board)?	☐ Yes ☐ No
70. Who makes decisions on adopting new practices in your household?	☐ Self ☐ Jointly with spouse/family ☐ Elders/others
71. Do you participate in peer-to-peer learning or exposure visits?	☐ Yes ☐ No

Benefits & Gaps

72. Which training was most helpful?	☐ Crop ☐ Livestock ☐ Water/Soil ☐ Digital/Business ☐ Processing ☐ None ☐ Other
73. Which training was least helpful?	☐ Crop ☐ Livestock ☐ Water/Soil ☐ Digital/Business ☐ Processing ☐ None ☐ Other
74. What is still missing for you?	☐ Technical ☐ Market ☐ Digital ☐ Finance ☐ Nothing ☐ Other
75. Which training will help you earn more?	☐ Crop ☐ Livestock ☐ Processing ☐ Digital ☐ Business ☐ Other
76. What extra support do you need from groups/government?	☐ Inputs ☐ Loan ☐ Training ☐ Market linkages ☐ Other

77. Have you faced barriers in training?	☐ Distance ☐ Cost ☐ Language ☐ Time ☐ None ☐ Other
78. Has training improved your decision-making in farming?	☐ No ☐ Somewhat ☐ Yes
79. Plan to adopt new practices in next season	☐ Yes ☐ Partially ☐ No

Future Needs

80. Do you want more training on	☐ High-value crops ☐ Plantation & Orchids ☐ Organic/NPM farming ☐ Nursery Management ☐ Use of mobile/internet for farming ☐ Mushroom Cultivation ☐ Farm Mechanisation ☐ Selling/marketing of produce ☐ Sustainable/Climate-smart farming ☐ Livestock/Goatery/Poultry/Fisheries management ☐ Value addition and food processing ☐ Financial literacy ☐ Entrepreneurship and business planning ☐ Gender and youth empowerment in agriculture ☐ Exposure visits/demonstration-based learning
81. What training is most needed in future?	☐ Crop ☐ Livestock ☐ Business ☐ Digital ☐ Processing ☐ Other
82. Do you want to become an Agri-entrepreneur (ecopreneur)?	☐ Yes ☐ No ☐ Maybe
83. What market support will help you most?	☐ Storage ☐ Processing ☐ Buyer ☐ Online market ☐ Other
84. What role should groups /government play in next 5 years?	☐ Training ☐ Finance ☐ Marketing ☐ Technology
85. Willingness to recommend training to other farmers?	☐ Yes ☐ No ☐ Maybe
86. Any suggestions	

FGD: Women Farmers

A. Background

1. Briefly introduction (name, age, landholding, main crops/livestock)?
2. What are your main sources of livelihood?

B. Perceptions & Awareness

3. What do you know about Green College/BRLF interventions in your village?
4. How relevant do you think these activities are to your needs as women farmers?
5. Have you noticed any change in farming practices due to these programs?

C. Knowledge & Practices

6. What new farming practices, inputs, or technologies have you learned recently?
7. Who do you usually take advice from for agriculture/livestock? (family, Mitra/CRP, govt officer, digital sources)
8. How aware are you of government schemes (KCC, PMKSY, NLDM, MGNREGA, etc.)?

D. Skills & Adoption

9. Have you received any training? If yes, what topics (farming, livestock, digital literacy, market linkages)?
10. Which of these trainings have you actually applied in your fields/homes?
11. What skills do you still feel you need more support in?

E. Inclusion & Agency

12. Do you feel women farmers are equally included in farmer trainings and schemes?
13. What challenges do women face in accessing schemes/markets/inputs compared to men?
14. Has your role in household or farming decisions changed in the last 2–3 years?

F. Challenges & Suggestions

15. What are the main barriers you face in farming (land, inputs, credit, water, market, mobility)?
16. How could Green College/BRLF improve support for women farmers

Questionnaire for Agro – Ecopreneur

Project: BRLF

Enumerator Name:

Mobile:

Date:

Section A: Respondent & Demographic Details

Q1. Name of respondent	
Q2. Phone number	
Q3. Age (in years)	
Q4. Gender	☐ Male ☐ Female ☐ Other
Q5. Social category	☐ General ☐ SC ☐ ST ☐ OBC ☐ Other
Q6. Education level	☐ Illiterate ☐ Primary ☐ Secondary ☐ Higher Secondary ☐ Graduate & above ☐ Other
Q7. Location	State: ___ District: ___ Block: ___ Village: ___
Q8. Are you a member of any SHG/ Producer Group/FPO?	☐ Yes ☐ No
8.1. If Yes, Name:	1. 2. 3.

Section B: Enterprise Profile

Q9. Are you currently operating any eco or Agri-based business?	☐ Yes, registered business ☐ Yes, not registered ☐ Planning to start ☐ No
Q9.1. If registered, specify type:	☐ MSME ☐ SHG/Society ☐ Partnership ☐ Proprietorship ☐ Other
Q10. Key service:	☐ Production ☐ Processing ☐ Marketing ☐ Agri-tourism ☐ Finance ☐ Others: _____
Q11. Does your enterprise focus on green/sustainable practices	☐ Yes, NPM practices ☐ Yes, high-value crops ☐ Yes, women-focused value networks ☐ Other (specify): _____ ☐ No
Q12. How many people are involved in your enterprise (excluding you)?	_____ persons
Influence over APC outcomes	☐ High ☐ Moderate ☐ Low

Q13. Alignment with APC goals (income, sustainability, collective action):	☐ Strongly aligned ☐ Partially aligned ☐ Not aligned
Q14. Are you recognized as an Agri-Entrepreneur under any government or project scheme?	☐ Yes ☐ No
14.1 If yes, Name of Scheme/Program:	

Section C: Training, Knowledge & Capacity Building

Q15. Have you received any previous training/support through institutional partnerships (e.g., Krishi Vigyan Kendra, Agriculture University, NGOs, Govt. Departments)?	☐ Yes ☐ No
Q16. In the past 12 months, have you attended any of the following trainings?	☐ Agroecology ☐ Livestock Management ☐ Food Processing ☐ Business plan development ☐ Digital literacy/use of apps ☐ Value addition ☐ Market strategies ☐ Other, specify ☐ None
16.1 If trained, who conducted the training?	☐ Krishi Vigyan Kendra ☐ Agriculture University ☐ NGOs ☐ Govt. Departments ☐ Other, than specify
Q16.2. Did you find the training(s) useful for your enterprise?	☐ Very useful ☐ Somewhat useful ☐ Not useful ☐ Did not attend
Q16.3. Any gap from you having in trainings	☐ Business planning ☐ Digital literacy ☐ Market linkage ☐ Finance/credit access ☐ Value addition ☐ Others:
Q17. Have you prepared a written business plan for your enterprise?	☐ Yes, with support ☐ Yes, self-prepared ☐ In process ☐ No
Q18. Do you need a further capacity building programs?	☐ Agroecology ☐ Livestock Management ☐ Food Processing ☐ Business plan development ☐ Digital literacy/use of apps ☐ Value addition ☐ Market strategies ☐ Other, specify ☐ None

Q.19 Have you used or participated in demonstration cum learning sites for training or showcasing practices?	☐ Yes, as a participant ☐ Yes, as a host/organizer ☐ No
Q.20. Do you apply any value addition techniques (e.g., processing, grading, packaging) to your farm produce?	☐ Yes, regularly ☐ Sometimes ☐ Rarely ☐ Never

Section D: Digital & Technological Practices

Q21. Do you use digital tools (smartphones, business apps, MIS, social media) for your business?	☐ Business/finance record-keeping ☐ Marketing/sales ☐ Sourcing inputs ☐ None
Q22. Access to technology:	☐ Smartphone & internet ☐ Only smartphone ☐ Only internet ☐ Neither
Q23. Have you participated in online/digital selling (e-commerce) for your products or services (e.g., Amazon, Flipkart, ONDC, local agri-portals) to sell your products?	☐ Yes, regularly ☐ Yes, occasionally ☐ No, but interested ☐ No, not interested
Q23.1 If yes, Name of platform:	
Q24. Member of any digital entrepreneur group (e.g., WhatsApp, Facebook)?	☐ Yes, regular participant ☐ Yes, occasional ☐ No ☐ Not aware

Section E: Access to Finance & Schemes

Q25. Have you received or applied for credit/financial support from any of these sources?	☐ MUDRA loan ☐ PMEGP ☐ Cooperative/SHG ☐ Commercial bank ☐ NGO/government program ☐ Not applied
Q26. Was your application successful?	☐ Yes, received funds ☐ Applied, not received ☐ Did not apply ☐ Not aware of any scheme
Q27. Main use of funds (if received):	☐ Business establishment ☐ Machinery/equipment ☐ Working capital ☐ Market expansion ☐ Others: -----

Section F: Markets & Linkages

Q28. Where do you primarily sell your products/services?	☐ Local market ☐ Cooperative/farmer group ☐ Retail/vendor ☐ Online/e-commerce ☐ Direct to consumer ☐ Other
Q29. Have you accessed new market channels or partnerships in the last 12 months?	☐ Yes, multiple new channels ☐ Yes, one new channel ☐ No change ☐ Not applicable

Q30. Has your enterprise income changed in the last year due to project support or training?	☐ Increased a lot ☐ Increased a little ☐ No change ☐ Decreased
Q31. Do you use e-commerce platforms (e.g., Amazon, Flipkart, ONDC, local agri-portals) to sell your products?	☐ Yes ☐ No
Q32. Is your business officially registered?	☐ Yes ☐ No
Q33. How often do you assess market demand or prices before selling your produce?	☐ Always ☐ Often ☐ Sometimes ☐ Never
Q34. Approximately what percentage of your farming activities involve both value addition and market planning?	☐ 0–20% ☐ 21–40% ☐ 41–60% ☐ 61–80% ☐ 81–100%

Section G: Institutional Support & Networks

Q35. Are you linked with any training institution, government agency, KVK, NGO, or entrepreneurial network?	☐ Yes, regular contact ☐ Yes, occasional ☐ No, but interested ☐ No
35.1 In last year number of training attended by you	-----
Q35.1 If Yes, then which organization	☐ Government Agency ☐ CSO/CBO ☐ Training Institutions ☐ NGO ☐ Other, specify
Q36. Are you part of any peer-to-peer or entrepreneur learning group?	☐ Yes, formal group ☐ Yes, informal ☐ No ☐ Not aware
Q37. Have you accessed any of the following inputs through institutional collaborations?	☐ Seeds ☐ Bio-pesticides ☐ Organic fertilizers ☐ Machinery ☐ Others (please specify):
Q38. Approximate % of your annual input requirement met through institutional collaborations:	☐ <25% ☐ 25–50% ☐ 51–75% ☐ >75%

Section H: Social Inclusion

Q39. Which of the following describes you best ?	☐ Woman ☐ Youth (18–35) ☐ Tribal community ☐ None
Q39.1 Do you work with or support indigenous women farmers in your enterprise (e.g., through green value networks)?	☐ Yes ☐ No

Section I: Open Suggestions

Q40. Have you received training or support from Green College in the following areas?	☐ Capacity building in APC 2.0 (production, processing, marketing) ☐ Agri-ecopreneur promotion & mentoring ☐ Training module/material development ☐ Digitization support (apps, ICT tools, record keeping) ☐ Training through practical field demonstrations ☐ Skill development as digital/non-digital promoter ☐ Other (specify): _____ ☐ None
Q41. What support would help you most as an ecopreneur? (Tick all that apply)	☐ Training ☐ Digital tools ☐ Credit ☐ Market linkages ☐ Peer group ☐ Mentoring ☐ Other
Q41.1 If select any, than specify...	

APC PMU(PRADHAN/ BRLF–Odisha) Stakeholder Questionnaire

Project: BRLF/APC Odisha

Enumerator Name:

Mobile:

Date:

District/ Block/Village:

Section A: Respondent & PMU Profile

Q No.	Question	Response
1	Name of PMU/Technical Agency Official	
2	Designation/Role	
3	Office location (State/District/Block)	
4	Years associated with APC Project/Green College	
5	Are you the nodal person for institutional linkages?	☐ Yes ☐ No

Section B: Institutional Collaboration & Partnerships

6	Has the PMU/Agency established formal partnerships with institutions/NGOs/government?	☐ Yes ☐ No
7	Number of institutional partnerships set up to date	_____ (number)
8	Types of partner institutions (tick all that apply):	☐ Agri Univ ☐ KVKs ☐ NGO ☐ Govt Dept ☐ Cert. body ☐ FIs ☐ Private ☐ Other: _____
9	Number of joint initiatives (training, PGS, certification, etc.) conducted with partners in last 3 years	_____ (number)
10	Does the PMU support access to government schemes/funds for collectives?	☐ Yes ☐ No
11	Approximate value of public/Govt funds leveraged for collectives/groups last year (Lakhs)	_____ (Lakhs)

Section C: Training, Capacity Building & Digital

12	PMU has developed or coordinated training/capacity building modules?	☐ Yes ☐ No
----	--	--

13	If Yes, number of distinct modules/events held in last year	----- (number)
13.1	Please provide name of these modules	1. 2. 3. 4. 5.
14	Has the PMU supported adoption of digital platforms/tech tools?	☐ Yes ☐ No

Section D: Monitoring, Certification & Outcomes

15	Does the PMU monitor the formation of elected boards or business plans?	☐ Yes ☐ No
16	Does the PMU track the % or number of groups/PCs certified (PGS/organic)?	☐ Yes ☐ No
17	Number of groups/PCs supported for certification in last 3 years	----- (number)
18	PMU tracking collective turnover or income increase of groups	☐ Yes ☐ No
19	Number of master trainer trained by PMU	

Section E: Social Inclusion

20	PMU guidelines or criteria for supporting women-led/marginalized groups?	☐ Yes ☐ No
21	Approximate % of project-supported groups led by women/marginalized	----- %
22	Mention any specific PMU policy or innovation for inclusion	-----

Section F: Planning, Coordination & Challenges

23	Plans to scale up PMU support/collaborations?	☐ Yes ☐ No ☐ Not sure
24	Main challenges for PMU in supporting/monitoring groups	
25	Suggestions to improve PMU's effectiveness	

Key Informant Interview (KII) Questionnaire for Civil Society Organization

Project: BRLF

Enumerator Name:

Mobile:

Date:

District/Block:

Village:

Section A: General Information

1. Name of CSO:	
2. Name of respondent & designation:	
3. State/District/Block covered:	
4. Duration of BRLF partnership:	☐ <1 year ☐ 1–3 years ☐ >3 years
5. Primary areas of intervention under BRLF:	☐ Agriculture ☐ Livestock ☐ Enterprise ☐ NRM ☐ Others:

Section B: Institutional Collaboration & Partnerships

6. Has your organization established any institutional partnerships for training, inputs, or resource support?	☐ Yes ☐ No
6.1. If yes, indicate type and number:	
○ Agricultural universities:	
○ Government departments:	
○ NGOs/private partners:	
7. How have these partnerships added value to your field-level interventions? (Probe for training quality, input access, credibility, etc.)	

Section C: Training & Capacity Building

8. Has your CSO been involved in developing context-specific training modules?	☐ Yes ☐ No
8.1. If yes, for which domains:	☐ Training Farmers ☐ Facilitating FPOs ☐ Market linkages ☐ Policy Advocacy ☐ Value Addition ☐ Others
9. What % of your CRPs have received training on the following: (%)	☐ NPM (Non-Pesticide Management): ☐ SIFS (Sustainable Integrated Farming Systems): ☐ Micro-irrigation: ☐ Digital tools (apps/MIS):
10. What % of trained CRPs/farmers apply these practices within 6 months of training?	

11. CSO has developed training/capacity building modules?	☐ Yes ☐ No
12. If Yes, please provide developed module name	1. 2. 3. 4. 5.
11. Have you observed a reduction in training gaps over time (through assessments or feedback)?	☐ Yes ☐ No
11.1. If 'Yes', then estimate reduction: (%)	
12. Are you facilitating or part of peer learning networks among CRPs or farmers?	☐ Yes ☐ No
12.1. If yes, No. of networks:	
13. Is there any bio-resource center set up by your CSO or in partnership?	☐ Yes ☐ No
13.1. If yes, how many:	

Section D: Monitoring, Adoption & Use of Digital Tools

14. How do you track the adoption and scalability of promoted practices (e.g., demo replication)?	
15. What % of CRPs are using digital platforms/tools (e.g., WhatsApp, MIS apps) for fieldwork and communication?	
16. Are CSO staff trained in participatory methods (e.g., PRA, FGD facilitation)?	☐ Yes ☐ No
16.1 If yes, what % apply these skills regularly?	

Section E: Challenges and Suggestions

17. What are the major challenges faced in implementing BRLF-supported interventions in your region?	
18. What support (from BRLF, government, or others) would strengthen your organization's field performance?	
19. Any innovative practices your CSO has introduced under BRLF that could be scaled up?	

Key Informant Interview (KII) Questionnaire for Frontline functionaries (Prani/Udyog/Krusha Mitras/CRPs)

Project: BRLF

Enumerator Name:

Mobile:

Date:

District/Block:

Village:

Section A: General & Background Information

Field	Response
Name of Mitra	
Gender	☐ Male ☐ Female ☐ Other
Age (in years)	
Phone Number	
Highest Educational Qualification	☐ No formal ☐ Primary ☐ Secondary ☐ Higher Secondary ☐ Graduation and above
Designation/Role	☐ Prani Mitra ☐ Krushi Mitra ☐ Udyog Mitra ☐ CRP
Duration in role	☐ <6 months ☐ 6–12 months ☐ 1–3 years ☐ >3 years
Appointing Agency/Organization	
Total Villages Covered	
Total Households Supported	
Avg. Households Engaged Monthly	
No. of PGs Supported	
Selected based on	☐ Agri knowledge ☐ Livestock expertise ☐ Business skills ☐ Community trust ☐ Past experience ☐ Other: _____
Part of SHG/Youth Club earlier?	☐ Yes ☐ No
Receive monthly honorarium?	☐ Yes ☐ No

Section B: Role & Community Engagement

1. Main Responsibilities (tick applicable):

Domain	Services/Tasks
Livestock (Prani Mitra)	i. ☐ Animal health support (vaccination, deworming) ii. ☐ Fodder cultivation guidance iii. ☐ Linking to veterinary services iv. ☐ Breed improvement awareness v. ☐ Promoting backyard poultry/goatery vi. ☐ Record keeping and reporting livestock issues
Agriculture (Krusha Mitra)	i. ☐ Demonstration of improved farming practices ii. ☐ Seed/fertilizer distribution support iii. ☐ Guidance on soil health & testing iv. ☐ Organizing farmer trainings v. ☐ Promotion of organic/natural farming vi. ☐ Pest & disease management awareness

Enterprise (Udyog Mitra)	i. ☐ Facilitating SHG/enterprise formation ii. ☐ Skill training support iii. ☐ Market linkage & product branding iv. ☐ Financial literacy awareness v. ☐ Linking to govt schemes/loans vi. ☐ Monitoring enterprise progress
CRP	i. ☐ Community Mobilization ii. ☐ Capacity Building iii. ☐ Livelihood Planning and Support iv. ☐ Monitoring and Documentation v. ☐ Input Linkage vi. ☐ Institutional Development vii. ☐ Government Coverages viii. ☐ Market Linkages ix. ☐ Conflict Resolution and Grievance Support

2. Frequency of community engagement:

☐ Daily ☐ Weekly ☐ Monthly ☐ Occasionally

3. Trust-building methods used:

☐ Door-to-door visits ☐ Village meetings ☐ Demo plots ☐ Transparent pricing ☐ Peer referrals ☐ Others: _____

4. Do you feel your responsibilities are clearly defined?

☐ Yes ☐ No ☐ Partially

5. How does the community respond to your services?

☐ Highly Positive ☐ Moderate ☐ Indifferent ☐ Negative

Section C: Training, Skills & Capacity

1. Have you received formal training? ☐ Yes ☐ No

Conducted by: ☐ CSO ☐ Government ☐ Both

Duration: _____ days

2. Topics Covered: ☐ Agroecology ☐ Livestock ☐ Food Processing ☐ Digital Literacy

☐ Value Addition ☐ NPM ☐ SIFS ☐ Micro-irrigation ☐ MIS/Digital tools

3. Do you receive refresher training? ☐ Yes ☐ No Frequency: _____

4. Approximate % of CRPs in your cluster who have accessed the above trainings:

_____ %

5. Do CSO staff or trainers in your area apply participatory training methods in the field?

☐ Yes ☐ No ☐ Don't Know

6. Confidence in technical advisory (For each scheme or services provided - rate your knowledge):

For Krushi Mitra (1 = Low; 5 = High)	1	2	3	4	5
1. Soil test-based nutrient application & fertilizer schedule	☐	☐	☐	☐	☐
2. Type of Macro and micronutrients in the market	☐	☐	☐	☐	☐
3. Climate-resilient/high-yielding crops or varieties	☐	☐	☐	☐	☐
4. Nursery raising / sowing techniques	☐	☐	☐	☐	☐
5. Weed control & use of weedicides	☐	☐	☐	☐	☐
6. Insect identification & control measures	☐	☐	☐	☐	☐
7. Disease identification & control measures	☐	☐	☐	☐	☐
8. Irrigation scheduling (by crop stage)	☐	☐	☐	☐	☐
9. Micro Irrigation practices and water saving techniques (Sprinkler/drip system)	☐	☐	☐	☐	☐
10. Fertigation techniques	☐	☐	☐	☐	☐
11. Use of sprayers and power tillers	☐	☐	☐	☐	☐
12. Post-harvest handling and storage	☐	☐	☐	☐	☐
13. Cultivation of post-rainy fallows	☐	☐	☐	☐	☐
14. Diversification to vegetables / high-value crops	☐	☐	☐	☐	☐
15. Compost and organic input preparation	☐	☐	☐	☐	☐
Can you understand and explain a soil health card to farmers?	☐ Yes ☐ No ☐ Partially				

For Prani Mitra (1 = Low; 5 = High)	1	2	3	4	5
1. Animal vaccination	☐	☐	☐	☐	☐
2. Deworming doses and schedules	☐	☐	☐	☐	☐
3. First aid for common livestock illnesses	☐	☐	☐	☐	☐
4. Breed selection and reproductive advice	☐	☐	☐	☐	☐
5. Feed formulation and feed making from local material	☐	☐	☐	☐	☐
6. Common zoonotic diseases and farmer protection	☐	☐	☐	☐	☐
7. Housing & hygiene (e.g., shed ventilation, cleaning)	☐	☐	☐	☐	☐
8. Record-keeping for animal health and production	☐	☐	☐	☐	☐
9. Nutrition guidance, Feed Supplements and their importance	☐	☐	☐	☐	☐

For Udyog Mitra (1 = Low; 5 = High)	1	2	3	4	5
1. MSME registration & entrepreneurship (e.g. Udyam, FSSAI)	☐	☐	☐	☐	☐
2. Loan Facilitation	☐	☐	☐	☐	☐
3. No. of entrepreneurs supported	☐	☐	☐	☐	☐
4. No. of Business trainings facilitated	☐	☐	☐	☐	☐
5. No. of marketing trainings facilitated	☐	☐	☐	☐	☐
6. Commodities supported for collective sale	☐	☐	☐	☐	☐
7. No. of Units supported	☐	☐	☐	☐	☐
8. Financial linkages/loans facilitation	☐	☐	☐	☐	☐

9. Govt. schemes linked	☐	☐	☐	☐	☐
10. Agriculture (e.g. PMKSY, KCC)	☐	☐	☐	☐	☐
11. Livestock (e.g. vaccination subsidy, NLDM)	☐	☐	☐	☐	☐
12. Social security (e.g. MGNREGA, PMAY, AAY)	☐	☐	☐	☐	☐

For Community Resource Person (1 = Low; 5 = High)	1	2	3	4	5
1. Community Mobilization	☐	☐	☐	☐	☐
2. Capacity Building	☐	☐	☐	☐	☐
3. Livelihood Planning and Support	☐	☐	☐	☐	☐
4. Monitoring and Documentation	☐	☐	☐	☐	☐
5. Input Linkage	☐	☐	☐	☐	☐
6. Institutional Development	☐	☐	☐	☐	☐
7. Government Convergence	☐	☐	☐	☐	☐
8. Market Linkages	☐	☐	☐	☐	☐
9. Conflict Resolution and Grievance Support	☐	☐	☐	☐	☐

7. Do you need more support or training? ☐ Yes ☐ No

If yes, 2–3 priority topics:

i.

ii.

iii.

8. Frequency of community engagement:

☐ Daily ☐ Weekly ☐ Monthly ☐ Occasionally

6. **Do you maintain service records?**

☐ Yes ☐ No

If yes, method: ☐ Paper register ☐ Mobile app ☐ SMS records ☐ Others: _____

Section D: Digital Use & Advisory

1. Do you use mobile/digital tools for advisory?	☐ Yes ☐ No
2. If yes, platforms used	☐ WhatsApp ☐ Mobile apps (specify): ☐ MIS platforms ☐ Others: _____
3. Content accessed	☐ Crop tips ☐ Pest alerts ☐ Weather ☐ Fertilizer schedule ☐ Market prices ☐ Govt schemes ☐ Demo videos ☐ Other: _____
4. Confidence in using digital tools (1 = Low; 5 = High)	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
5. Challenges in using digital platforms	☐ Poor internet ☐ Language barrier ☐ App complexity ☐ Device issues ☐ Farmers not interested ☐ Others: _____
6. Approximate % of CRPs in your block/cluster using such digital tools:	

Section E: Domain-Specific Functional Questions

A. Agriculture/Krushhi Mitra Only

- No. of crop demos facilitated:
- Crops promoted: ☐ Paddy ☐ Pulses ☐ Vegetables ☐ Millets ☐ Fruits
- No. of farmers adopting improved practices: Men- , Women-
- Inputs facilitated:
- Market linkage or FPO support provided: ☐ Yes ☐ No

B. Livestock/Prani Mitra Only

- Livestock supported: ☐ Cattle ☐ Goat ☐ Poultry ☐ Others:
- Last 12-month vaccinations:
- Deworming campaigns:
- Animal husbandry demonstrations:
- Type of services: ☐ Vaccination ☐ Health advice ☐ Feed sales ☐ AI ☐ First aid
- Schemes facilitated (e.g., NLDM):

C. Enterprise/Udyog Mitra Only

- No. of entrepreneurs supported:
- Training facilitated: i). Business: ii). Marketing:
- Financial linkages/loans supported: ☐ Yes ☐ No
- Schemes facilitated: ☐ Udyam ☐ PMEGP ☐ KCC ☐ FSSAI ☐ Others:
- Use of portals: ☐ Udyam ☐ MGNREGA ☐ Dept. apps ☐ Others:

D. CRPs member Only

- No. of crop demos facilitated:
- Crops promoted: ☐ Paddy ☐ Pulses ☐ Vegetables ☐ Millets ☐ Fruits
- No. of farmers adopting improved practices (Agri/Livestock): Men- , Women-
- Inputs facilitated (seeds, feed, raw materials, etc.):
- Livestock supported: ☐ Cattle ☐ Goat ☐ Poultry ☐ Others:
- Vaccination & deworming conducted (No. of animals):
- No. of entrepreneurs supported:
- Training facilitated (any domain):
- Financial or market linkage support provided: ☐ Yes ☐ No
- Schemes/portals facilitated: ☐ KCC ☐ PMEGP ☐ Udyam ☐ NLDM ☐ Others:

Section F: Institutional Partnerships & Access to Resources

1. Have you been involved in any partnerships between your organization and external institutions for training or resources?	☐ Yes ☐ No
2. If yes, please list the type of institutions:	☐ Agricultural Universities ☐ KVKs

	☐ NGOs ☐ Government Departments ☐ PGs/ PCs ☐ Others: _____
3. How many such institutional partnerships were established in the past 2 years for training or resource access?	 Number of partnerships
4. What kind of support was received through these partnerships?	☐ Training modules ☐ Resource materials ☐ Demonstration support ☐ Market linkage support ☐ Others: _____
5. Which schemes or sources were mainly used?	☐ NABARD ☐ NRLM ☐ State Government ☐ Banks ☐ Other: _____

Section G: Institutional Strengthening and Learning

1. Do you consciously ensure inclusion of women, SC/ST, and vulnerable households in your work?	☐ Always ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
2. Are you part of any peer-to-peer learning network formed after training sessions?	☐ Yes ☐ No
If yes, how many such networks are active?	
3. Do you regularly interact or share experiences with other CRPs or farmer trainers?	☐ Always ☐ Sometimes ☐ Rarely ☐ Never
4. Have any bio-resource centers been established in your region to provide sustainable agricultural inputs?	☐ Yes ☐ No
If yes, how many?	
5. Are you aware of any demo units (e.g., compost units, model farms) replicated by trainees' post-training?	☐ Yes ☐ No
If yes, approximate number	
6. Have you observed CSO (Civil Society Organization) staff using participatory methods (e.g., PRA, FGDs) in the field?	☐ Yes ☐ No
If yes, estimate % of trained staff applying these methods	

Section G: Impact, Challenges, and Suggestions

1. Observed Community Impact (✓ observed):

Area	✓	Remarks
Improved practices	☐	_____

Area	✓	Remarks
Income/livelihood improvement	☐	-----
Market access improved	☐	-----
Awareness of schemes	☐	-----
Inclusion (Women, SC/ST)	☐	-----

2. Do you have access to budgets, staff support, or devices to deliver your responsibilities effectively?

☐ Always ☐ Sometimes ☐ Rarely ☐ Never

3. Community response to your services:

☐ Highly Positive ☐ Moderate ☐ Indifferent ☐ Negative

Briefly explain: -----

4. What are the biggest challenges you face in delivering your role (tick all):

☐ Transport ☐ Inadequate training ☐ Low honorarium ☐ Digital barriers

☐ Farmer engagement ☐ Heavy workload ☐ Coordination issues ☐ Other:

5. Top 3 barriers farmers face in accessing schemes:

☐ Lack of awareness ☐ Travel constraints ☐ Complex paperwork

☐ Digital illiteracy ☐ Eligibility criteria ☐ Delays ☐ Other: -----

6. Suggestions for improving your role and project effectiveness:

a.

b.

Questionnaire for Government Department Representatives

Project: BRLF/APC Odisha

Enumerator Name:

Mobile:

Date:

State/District/Block:

Section A: Respondent Profile

1. Name of Respondent:	
2. Designation:	
3. Department/Agency Name:	
4. District and Block:	
5. Contact no.	
6. Years of experience in this role:	

Section B: Convergence and Collaboration

7. Are there existing convergences between your department and CSOs	Yes No
7.1 If yes, specify number and name	
8. Convergence areas:	Training Partner: Scheme Facilitation: local institution setup: capital support:
9. Has your department signed any MoUs or developed joint action plans for farmer capacity-building with BRLF?	Yes No
9.1. If yes, briefly describe:	
10. What support does your department provide for such collaborations?	☐ Technical support ☐ Financial assistance or subsidies ☐ Infrastructure or resource sharing (e.g., use of facilities, equipment) ☐ Policy or regulatory support ☐ Capacity building and skill development programs ☐ Market linkage or promotional support ☐ Research and data sharing ☐ Monitoring and evaluation support ☐ Coordination with other departments/agencies ☐ No direct support provided ☐ Other (please specify):

Section C: Training and Institutional Support

11. Are standardized government training modules or ToTs available for CSO trainers or extension workers?	1. ☐ Yes ☐ No ☐ Don't know
---	---

12. Does your department integrate climate-resilient practices in the training curriculum?	
13. Does your department integrate gender-responsive practices in the training curriculum?	
14. Is there a plan to scale the master trainer approach under government programs (NRLM, Agriculture, Horticulture, etc.)?	☐ Yes ☐ No ☐ Don't know
14.1. If yes, how?	

Section D: Digital Integration and Tools

15. Does your department promote or use any digital/mobile applications for	
Training delivery	☐ Yes ☐ No ☐ Don't know
Farmer advisories	☐ Yes ☐ No ☐ Don't know
Monitoring & reporting	☐ Yes ☐ No ☐ Don't know
16. Are CSO trainers oriented or supported to use these digital tools?	☐ Yes ☐ No

Section E: Monitoring and Evaluation

17. How does your department track training participation?	☐ Attendance sheets ☐ Mobile applications ☐ Reports from CSOs/Field officers ☐ Others:
18. Are training attendance and participation disaggregated by gender, age, and community (e.g., ST, SC)?	1. ☐ Yes ☐ No ☐ Don't know
19. What methods are used to assess training effectiveness?	
20. What methods are used to track outcomes?	
21. Are training calendars, rosters, and materials regularly shared with trainers/partner organizations?	

Section F: Challenges and Opportunities

22. What key challenges do you face in engaging tribal women in government-led training programs?	
23. What are the main logistical/resource constraints in conducting training programs?	
24. In your view, what improvements are needed in the following	○ Training content: ○ Delivery model: ○ Institutional support: ○ Other:

Producer Group Executives Questionnaire

Project: BRLF

Enumerator Name:

Mobile:

Date:

District/Block:

Section A: Executive Profile and Producer Group (PG) Overview

Question	Response
1. Executive Name	
2. Designation/Role	
3. PG Name	
4. Location (State/District/Block/Village)	
5. Age	
6. Years associated with this PG	
7. Is the PG majority-led by women (over 50% leadership)?	☐ Yes ☐ No
8. Does the PG have a formally elected Board of Directors?	☐ Yes ☐ No
9. How often does the Board meet?	☐ Monthly ☐ Quarterly ☐ Half-yearly ☐ Annually ☐ Other: _____

Section B: Institutional Collaboration and Support

Question	Response
10. Has your group partnered with any institutions (NGOs, government departments, KVKs, etc.) for training, input supply, or market access?	☐ Yes ☐ No
10.1 If yes, which types of institutions and for what purposes?	
10.2 What kind of support have these partnerships provided	
11. How helpful have these partnerships been for your group's functioning?	

Section D: Training, Capacity Building & Technology Use

12. What training have group leaders or members received in the past year? (e.g., sustainable farming, marketing, business, digital literacy)	
13. Have members applied these skills in practice?	☐ Yes ☐ No
13.1. If yes, to what extent?	
14. Are digital tools (like WhatsApp, apps, MIS) used by the group for communication or record-keeping?	☐ Yes ☐ No
14.1. If yes, which tools?	
15. Are any peer-to-peer learning networks formed between group members or with other groups?	☐ Yes ☐ No
15.1. If yes, describe briefly	
16. No. of post-harvest management structure established in last two year	

Section E: Financial Access and Market Linkages

Question	Response
17. Has your group been able to sell collectively?	☐ Yes ☐ No
17.1. If yes, what products and where?	
18. What challenges do you face in accessing markets or better prices	
19. Have group members accessed credit, input, or support through schemes or CSOs?	☐ Yes ☐ No
19.1. If yes, give details.	

Section F: Governance, Leadership & Group Functioning

20. Rate the following aspects related to the PG's governance and operations	Response (1=Poor to 5=Excellent):
1. Member participation and engagement	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
2. Transparency in decision-making	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
3. Board/leadership effectiveness	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
4. Quality of record-keeping	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5. Business and market operations efficiency	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
6. Access to credit/finance	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
7. Skill development and training access	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
8. Innovation and adoption of new practices	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
9. Collaboration with government/NGO/CSR	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section G: Inclusion & Social Impact

Question	Response
21. What percentage of group leaders are women or from marginalized communities?	
22. Has your group supported or initiated any women-led activities or businesses	☐ Yes ☐ No
22.1. If yes, provide examples.	
23. What change have you observed in livelihoods, skills, or confidence among group members since formation?	

Section H: Future Plans and Feedback

Question	Response
24. Are there plans to expand institutional collaborations or training programs?	☐ Yes ☐ No ☐ Not sure
24.1. If 'Yes', than explain	
25. What challenges do PG executives face in market linkages, finance access, or capacity building?	
26. Suggestions to improve PG executive training and business support	

Producer Company Executives Questionnaire

Project: BRLF

Enumerator Name:

Mobile:

Date:

District/Block:

Section A: Executive Profile and Producer Company (PC) Overview

Question	Response
1. Executive Name	
2. Designation/Role	
3. PC Name	
4. Location (State/District/Block/Village)	
5. Age	
6. Years associated with this PC	
7. Is the PC majority-led by women (over 50% leadership)?	☐ Yes ☐ No
8. Does the PC have a formally elected Board of Directors?	☐ Yes ☐ No
9. How often does the Board meet?	☐ Monthly ☐ Quarterly ☐ Half-yearly ☐ Annually ☐ Other: _____
10. Does your PC have a documented business plan?	☐ Yes ☐ No

Section B: Institutional Collaboration and Resources

Question	Response
11. Has your PC established institutional partnerships for training, input supply, or market linkages?	☐ Yes ☐ No
11.1 If yes, which type of institutions are partnered with? (Check all that apply)	☐ Agricultural Universities ☐ KVKs ☐ NGOs ☐ Government Departments ☐ Financial Institutions ☐ Certification Bodies ☐ Private Companies ☐ Others: _____
11.2 Number of institutional partnerships established to date:	_____ (number)

11.3 What purposes do these partnerships serve? (Check all that apply)	☐ Skill development/training ☐ Input supply ☐ Market linkages ☐ Credit & finance ☐ Technology transfer ☐ Sustainable practice promotion ☐ Infrastructure sharing ☐ PGS certification support ☐ Others: _____
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Section C: Certification and Compliance

12. Is your PC certified under PGS/ organic or any sustainable agriculture certification?	☐ Yes ☐ No
12.1 If yes, year of certification:	
13. Has your PC collaborated with institutions for PGS certification or sustainable agriculture promotion?	☐ Yes ☐ No
13.1 Number of joint initiatives in the last 3 years: (in numbers)	

Section D: Training, Capacity Building & Technology Adoption

14. What training programs or skill development initiatives are PC executives exposed to? (e.g., business management, digital tools)	
15. % of PC executives applying newly learned business, digital, or market strategies within 6 months	
16. % of PC executives using digital tools for business processes (apps, MIS platforms)	
17. Does your PC provide training support to members on high-value crop cultivation or sustainable practices?	☐ Yes ☐ No

Section E: Financial Access and Market Linkages

Question	Response
18. Main sources of working capital for your PC (Check all that apply)	☐ Member contributions ☐ Bank loans ☐ Grants ☐ Others: _____

19. Number of PC members accessing credit via government or institutional schemes:	_____ (number)
20. Has your average monthly income of PC members increased after joining the PC?	☐ Yes ☐ No ☐ Not sure
21. Total turnover of PC through collective marketing (in lakhs):	_____ (in Lakhs)
22. % of PCs with diversified buyer portfolios (≥ 3 channels)	_____ %

Section F: Governance, Leadership & Group Functioning

23. Rate the following aspects related to the PC's governance and operations	Response (1=Poor to 5=Excellent):
1. Member participation and engagement	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
2. Transparency in decision-making	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
3. Board/leadership effectiveness	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
4. Quality of record-keeping	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
5. Business and market operations efficiency	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
6. Access to credit/finance	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
7. Skill development and training access	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
8. Innovation and adoption of new practices	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
9. Collaboration with government/NGO/CSR	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section G: Inclusion & Social Impact

Question	Response
24. % of women in leadership roles within the PC	
25. % of marginalized caste/ethnic groups in PC leadership	
26. Has the PC facilitated women-led business plans or collectives?	☐ Yes ☐ No

Section H: Future Plans and Feedback

Question	Response
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27. Are there plans to expand institutional collaborations or training programs?	☐ Yes ☐ No ☐ Not sure
28. What challenges do PC executives face in market linkages, finance access, or capacity building?	
29. Suggestions to improve PC executive training and business support	

Producer Company Board Member Questionnaire

Project: BRLF

Enumerator Name:

Mobile:

Date:

District/Block:

Section A: Board Member Profile and Producer Company (PC) Overview

Question	Response
1. Name	
2. Designation/Role on Board	☐ Chairperson ☐ Secretary ☐ Treasurer ☐ Director (specify portfolio): _____ ☐ Other:
3. PC Name	
4. Location (State/District/Block/Village)	
5. Age	
6. Gender:	☐ Male ☐ Female ☐ Other
7. Caste/Social Group:	☐ ST ☐ SC ☐ OBC ☐ General
8. Educational Qualification:	☐ Non-literate ☐ Primary ☐ Secondary ☐ Higher
9. Number of years as Board Member:	
10. Years associated with the PC	

Section B. Roles, Meetings & Participation

11. How often does the Board meet?	☐ Monthly ☐ Quarterly ☐ Bi-annually ☐ Annually
12. How many Board meetings have you attended in the last 12 months?	☐ All ☐ Most ☐ Few ☐ None
13. Rate the effectiveness of board meetings in decision-making:	1 (Not effective) – 5 (Highly effective) ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
14. What is your primary responsibility as Board member?	☐ Strategic decisions ☐ Financial oversight ☐ Marketing ☐ Member relations ☐ Compliance/legal ☐ Other:
15. How would you rate overall Board effectiveness?	☐ Excellent ☐ Good ☐ Average ☐ Poor
16. Top challenges faced by the Board	☐ Low participation ☐ Lack of training ☐ Limited market access ☐ Poor financial performance ☐ Staff/management coordination ☐ Policy/legal compliance ☐ Other:

17. Have regular audits (internal/external) been conducted in the last year?	☐ Yes, both internal and external ☐ Only internal ☐ Only external ☐ No
18. What do you think should be improved in how the PC Board functions?	

Section C. Operations/PHM (Procurement, Handling & Marketing)

19. Are quality control standards clearly defined and implemented?	☐ Yes ☐ Partially ☐ No
20. Rate the timeliness and reliability of logistics and supply chain operations:	1 (Poor) – 5 (Excellent) ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
21. Are there operational bottlenecks that affect production or delivery?	☐ Yes ☐ No If Yes, please specify:

Section D. Markets

22. How does the company identify and secure buyers for products?	☐ Long-term contracts ☐ Spot sales ☐ Market intermediaries ☐ Others:
23. Are contracts with buyers formalized and monitored effectively?	☐ Yes ☐ Partially ☐ No
24. How would you rate the company's price forecasting and planning ability?	1 (Poor) – 5 (Excellent) ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
25. Are payments from buyers received timely?	☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely
26. Suggestions to improve market access:	

Section E. Finance / P&L

27. Are accounts maintained in a transparent and up-to-date manner?	☐ Yes ☐ Partially ☐ No
28. Rate the adequacy of working capital management:	1 (Poor) – 5 (Excellent) ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
29. Are profit margins monitored and optimized regularly?	☐ Yes ☐ Partially ☐ No
30. Are statutory filings (tax, company, regulatory) completed on time?	☐ Yes ☐ Partially ☐ No

31. Key financial challenges faced by the company:	
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Section F. System/MIS

32. Are records of production, sales, and finances digitized?	☐ Fully ☐ Partially ☐ Not at all
33. Are dashboards available for board-level decision-making?	☐ Yes ☐ Partially ☐ No
34. Can products be traced effectively from procurement to sale?	☐ Yes ☐ Partially ☐ No
35. Suggestions to improve MIS / data systems	

Section G. Credit/Compliance

36. Does the company have access to bank lines of credit or loans?	☐ Yes, sufficient ☐ Yes, but insufficient ☐ No
37. Are all regulatory compliances (labor, environment, safety) adhered to?	☐ Fully ☐ Partially ☐ No
38. Are there delays or issues in obtaining credit or regulatory approvals?	☐ Yes ☐ No If Yes, please describe:
39. Key compliance challenges	

Section H. Overall Assessment

40. Overall, how would you rate the company's performance in the last year?	1 (Poor) – 5 (Excellent) ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
41. What are the top three priorities the board should focus on in the next year?	1. 2. 3.
42. What is your vision for the Producer Company over the next 2–3 years?	
43. Are there plans for diversifying into new products, markets, or value chains?	☐ Yes ☐ No ☐ In Process
43.i. If yes, specify:	
44. How do you plan to enhance member participation and ownership in the future?	

8.5 Annexure V: Training Agenda

Training Program Agenda – BRLF Project

Day 1: 18th September 2025

Venue: Kushabhadra Conference Hall (YVDSS)

Time	Session	Details
11:50 AM – 12:15 PM	Introduction & Welcome	Participant introduction and opening
12:15 – 01:15 PM	Session I: Classroom Training	- Introduction to BRLF Project - Objectives & scope - Types of project questionnaires (PG members, stakeholders, functionaries, etc.) - Roles & responsibilities of survey team
01:15 – 02:00 PM	Lunch	
02:00 – 04:00 PM	Session II: Questionnaire discussion (Farmer Questionnaire, Agro-Ecopreneur)	Discussion on CAPI-designed questionnaires
04:00 – 04:30 PM	Tea	
04:30 – 06:00 PM	Session III (A): Questionnaire discussion (Farmer Questionnaire, Agro-Ecopreneur)	Continuing Session II, all enumerators will discuss the CAPI-based questionnaire, followed by hands-on practice with the CAPI module to become familiar with the questionnaire.
04:30 – 06:00 PM	Session III (B): KII Questionnaire (PC/PG Board member, Executives, Mitra's, Master trainer etc.)	Parallely, a discussion will be held with supervisors to review the KII questionnaires and the FGD format for women farmers.
06:00 PM	Closing Remarks	End of Day 1

Day 2: 19th September 2025

Venue: Dhenkanal District (Village details provide by BRLF office)

Time	Session	Details
8:00 AM – 6:00 PM	Field training and pilot training	- Orientation on field protocols and team roles - Practical demonstration of CAPI-based data collection - Mock interviews with farmers and community members - Pilot testing of questionnaires (PG members, KII) - Review of challenges and corrective measures - Feedback and final readiness for actual survey

Day 3: 20th September 2025

Venue: Kushabhadra Conference Hall (YVDSS)

Time	Session	Details
09:30 AM – 01:00 PM	Classroom de-briefing/ Finalisation of tools post-pilot	- Addressing doubts & FAQs - If any suggestions or corrections are received during the survey team discussion, the questions in the questionnaire will be edited or deleted accordingly. - Final instructions for field survey - Distribution of survey materials & team-wise planning
01:00 – 02:00 PM	Lunch	
After lunch, the enumerators and supervisors will travel to their allotted districts to commence work the following day.		

8.6 Annexure VI: Survey timeline in two phases

A: Sample was completed in selected Blocks in phase 1

Phase 1				
Team	District	Block	Enumerator cover Village	Date
Team-1	Koraput	Similiguda (2 enumerators, 1 supervisor)	Renga	21.09.2025
			Dudhari*	21.09.2025
			Marla	22.09.2025
				23.09.2025 travel day
		Boriguma (2 enumerators, 1 supervisor)	Janiguda	24.09.2025
			Anchala*	24.09.2025
			Bijapur*	25.09.2025
Team-2	Kalahandi	Lanjigarh (2 enumerators, 1 supervisor)	Kumkhal	21.09.2025
			Dukriguda	21.09.2025
			Asurguda	22.09.2025
			23.09.2025 travel day	
	Nuapada	Khariar (2 enumerators, 1 supervisor)	Pakhansara	24.09.2025
			Mahulkot	24.09.2025
			Kudal dungari	25.09.2025
Team-3	Jharsuguda	Laikera (2 enumerators, 1 supervisor)	Patrapali	21.09.2025
			Odiapali*	21.09.2025
			Beldunguri*	22.09.2025
			23.09.2025 travel day	
	Bolangir	Belpara (2 enumerators, 1 supervisor)	Dunguri Guda	24.09.2025
			Mandadara	24.09.2025
			Khalkhali	25.09.2025 half day work
				25.09.2025 half day travel
		Khaprakhol (2 enumerators, 1 supervisor)	Jhankarpali	26.09.2025
			Matiaabahal*	26.09.2025
			Budhibahal	27.09.2025
Team-4	Myurbhanj	Thakurmunda (2 enumerators, 1 supervisor)	Sarubil*	21.09.2025
			Akhapalani*	21.09.2025
			Jamunalia	22.09.2025
			23.09.2025	
	Dhenkanal	Kankahada (2 enumerators, 1 supervisor)	Rodang	24.09.2025
			Phulajhari	24.09.2025
			Jarada	25.09.2025
*Village changed due to non-availability of the farmers group by the CSO partner.				

B: Remaining sample was collected in Phase 2

Phase 2				
Team	District	Block	Enumerator cover Village	Date
Team 1	Rayagada	Bisamkatak (1 enumerators, 1 supervisor)	Talebarangpada	04.10.2025
			Hikiri	05.10.2025
			Pichiliguda	06.10.2025
		Kolnara (1 enumerator, 1 supervisor)	Patraput	07.10.2025
			Sorada	08.10.2025
			Erukiti	09.10.2025
Team 2	Kandhmal	Baliguda (1 enumerators, 1 supervisor)	Sudra	04.10.2025
			Rutungia	05.10.2025
			Bandespanga	06.10.2025
Team 3	Boudh	Kantamal (1 enumerator, 1 supervisor)	Pratipal	04.10.2025
			Keutipali	05.10.2025
			Landapadar	06.10.2025
Team 4	Keonjhar	Bansapal (1 enumerators, 1 supervisor)	Rugudi	04.10.2025
			Kendughati	05.10.2025
			Talachampe	06.10.2025
		Harichandanpur (1 enumerator, 1 supervisor)	Rohi	07.10.2025
			Kamalangi	08.10.2025
			Tangiriapal	09.10.2025

8.7 Annexure VII: Propensity Score Matching Analysis

A. PSM Model Specification

Item	Description
Treatment group	APC households (PG members)
Control group	Non-APC households (Control farmers)
Outcome purpose	Improve comparability for baseline analysis
Estimation method	Binary logistic regression
Matching algorithm	1:1 Nearest Neighbour Matching
Replacement	Without replacement
Common support	Enforced
Standard errors	Robust
Total observations (pre-matching)	365
Matched sample size	276 APC + 89 Control (matched pairs)

B. Covariates Used in Propensity Score Estimation (BRLF Indicator Wording)

- Landholding size (acres)
- Access to irrigation (Yes=1/No=0)
- Livestock ownership (Yes=1/No=0)
- Household size (number of members)
- Social category (ST / SC / Others)
- Baseline annual average household income category
- Prior exposure to agriculture-related training (Yes=1/No=0)
- Primary occupation: agriculture & allied (Yes=1/No=0)

C. Covariate Balance Diagnostics (Before and After Matching)

Covariates	Unmatched Mean (PG)	Unmatched Mean (Control)	Unmatched SMD	Matched Mean (PG)	Matched Mean (Control)	Matched SMD
landholding size (acres)	2.60	2.10	0.42	2.35	2.32	0.03
Access to irrigation (%)	34.8	27.5	0.31	31.6	30.9	0.02
Households with livestock (%)	43.0	24.7	0.38	36.8	35.9	0.02
Household size	5.2	5.0	0.12	5.1	5.1	0.01
Scheduled Tribe households (%)	52.0	59.5	-0.30	55.8	56.2	-0.01
Scheduled Caste households (%)	15.9	13.5	0.14	14.7	14.9	-0.01
Baseline annual average income (₹)	69,400	57,600	0.45	62,800	62,100	0.02
Prior training exposure (%)	71.0	29.2	0.78	48.5	47.9	0.01
Primary occupation: agriculture (%)	93.5	88.8	0.20	91.2	90.8	0.01

SMD: Standardized Mean Difference

D. Overall Balance Statistics

Indicator	Before Matching	After Matching
Mean standardized bias	0.35	0.02
Maximum standardized bias	0.78	0.03
Covariates with	SMD	> 0.10
Mean propensity score difference	0.0954	0.0004

8.8 Annexure VIII: Statistical Analysis Regarding Adoption of Sustainable Practices on Different factors

Dependent Variable:

Variable	Values
Adoption of Agriculture Improved Practices	1 = Yes, 0 = No

Independent Variable:

Variable	Values
Age	In years
Education	ordinal (0=Illiterate, 1=Primary, 2=Secondary, 3=Higher Secondary, 4=Graduation and above)
Own land	In acres
Having Livestock	1 = household keeps livestock, 0 = No
Received training	1 = Yes, 0 = No
Received Input	1 = Yes, 0 = No

Model specification (fitted)

$$\log \frac{P(\text{Adopt} = 1)}{1 - P(\text{Adopt} = 1)} = \beta_0 + \beta_1 \text{Age} + \beta_2 \text{Education} + \beta_3 \text{Own land} + \beta_4 \text{Having}$$

Constant = β_0 , Received Agriculture Training = β_2 , Received inputs

Model Fit Summary:

Observation (n)	276
Pseudo R²	0.032
AIC	320.26
Model p-value (LLR)	0.447

Logistic Regression Table:

Variable	Coef.	Std. Err	z	p-value	95% CI (Lower)	95% CI (Upper)
Constant	0.1038	1.9072	0.054	0.956	-3.634	3.842
Age	-0.0246	0.0165	-1.492	0.136	-0.0570	0.0077
Own land (Per Acre)	0.2127	0.0997	2.132	0.033*	0.0172	0.4081
Having Livestock	0.3256	0.3833	0.849	0.396	-0.4256	1.0767
Received Training	0.1210	0.3489	0.347	0.729	-0.5628	0.8048
Received Inputs	0.7615	0.5717	1.332	0.183	-0.3591	1.8821
Education	0.1643	0.1114	1.475	0.140	1.1786	0.9475

* Represent Significant Value (which is less than 0.05)

Odds Ratio Table (with 95% CI)

Variable	Odds Ratio	CI Low	CI High	p-value
Own land (Per Acre)	1.237	1.017	1.504	0.033
Received Inputs	2.141	0.698	6.567	0.183
Education	3.187	0.487	20.863	0.227
Having Livestock	1.385	0.653	2.935	0.396
Received Training	1.129	0.570	2.236	0.729
Age	0.976	0.945	1.008	0.136

8.9 Annexure IX: Photographs and field visit documentation



