Midline Study Report:

Sustainable Spices Programme – Gramodaya

A CSR Initiative of Synthite Industries Pvt Ltd

Sept 24-June 26

READ ASSOCIATES LLP

Ernakulam

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EXECUTIVE SUMMARY

The Midline Study Analysis Report evaluates the Gramodaya Turmeric Sustainability Program (2024–2027), a CSR initiative of Synthite Industries, implemented across 20 villages in Karnataka. The assessment, conducted between June-July 2026, employed a mixed-method approach—surveying 34 demo farmers and 30-32 non-demo farmers, conducting Focus Group Discussions across four clusters, and undertaking Key Informant Interviews.

Key Achievements

- 94.1% of farmers adopted ≥2 sustainable practices (against 50% target)
- 64.7% adopted soil testing (baseline: 6.5%)
- 100% reported improved market access and knowledge on sustainable farming
- 97.1% farmers reported being satisfied or highly satisfied with the project
- 97.1% shared project learnings with fellow farmers, demonstrating strong peer-to-peer diffusion
- 100% farmers now use drip irrigation (baseline: 83%)

Key Challenges

- Labour costs account for 35.8% of total cultivation cost, with 80% farmers reporting increased wages
- Climate vulnerability—failed pre-monsoon in 2026 and groundwater depletion beyond 500 feet pose serious risks
- Institutional fragility—BRCs largely function for self-consumption rather than commercial enterprises; FPO remains dependent on implementing agency
- Weak governance—delayed recruitment and ambiguous three-tier structure in Year 1 resulted in poor monitoring
- Limited women's participation—only 2 of 34 demo farmers were women

Recommendations

- Strengthen FPOs into self-sustaining farmer-owned enterprises
- Commercialise BRCs through market linkages and quality standards
- Promote mechanisation through custom hiring centres
- Institutionalise governance model with clear Terms of Reference
- Mainstream gender participation with measurable targets

The project has demonstrated strong grassroots efficacy with high farmer confidence. However, consolidating governance, strengthening institutions, and addressing labour and climate challenges remain critical for long-term sustainability and scalability.

CHAPTER 1

INTRODUCTION

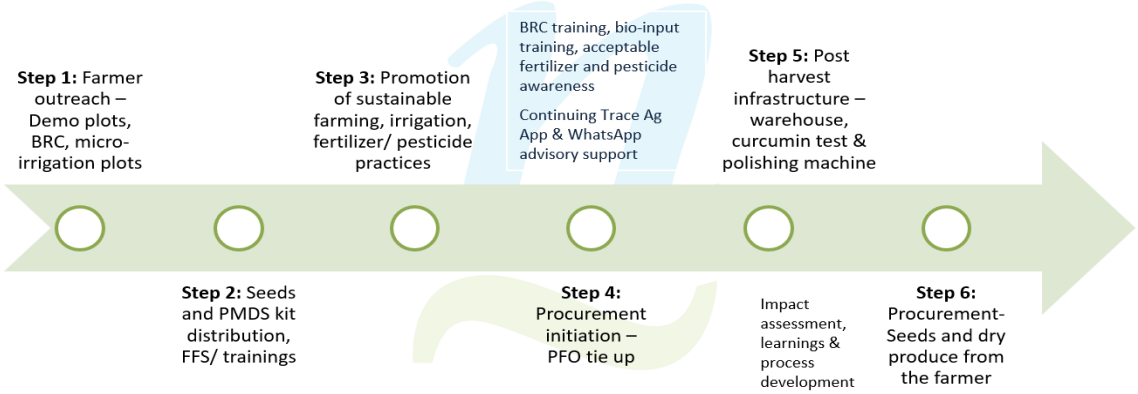
Synthite Industries, through its CSR initiative, is implementing the Gramodaya Turmeric Sustainability Program (2024–2027) in Kollegal and Hannur blocks, Karnataka. The program aims to promote climate-resilient, sustainable turmeric farming while improving farmer livelihoods and strengthening institutions. Gramodaya is the strategic CSR initiative to develop a scalable model that enhances farmers' livelihoods while promoting sustainable agriculture. The project focuses on improving farm productivity, profitability, and resilience through Good Agricultural Practices (GAP), soil and water management, innovative technologies, and community-based institutions.
The project covers 20 villages, 1,500 farmers, 1,000+ acres, 80 demo plots covering 550 acres. It focuses on Good Agricultural Practices (GAP), regenerative agriculture, water conservation, and Farmer Producer Organisations (FPOs) strengthening.

This the assignment analyzes the impact of the Sustainable Spices Programme implemented in 20 villages of Kollegal, targeting 1,500 turmeric farming households over three years. The analysis compares baseline findings (Dec 2024 - Feb 2025) with midline impact survey data (collected in June 2026) from 34 selected demo farmers and also farmers from the non-intervention villages in Kollegal Block in Chamarajanagar district in Karnataka.

Brief note on the Project Implementation

The project is implemented by Pasidi Panda Foundation (PPF). During its first year, implementation involved a three-tier structure comprising **Satvva Consulting/Vrutti**, PPF, and Synthite. In the second year, the governance model was streamlined, with PPF leading field implementation under the direct oversight of Synthite's CSR team, supported by **READ Associates** for CSR advisory and the Business Development team of Synthite. This transition enabled closer integration between CSR objectives and sector-specific technical support.

The **project implementation process** is as follows:



Although the project commenced in September 2024, field implementation was aligned with the turmeric cropping season, with major activities beginning during the **2025–26 cultivation cycle**. PPF mobilised a dedicated field team comprising an agronomist, field coordinator, and field executives, who established regular engagement with farmers through village visits, Farmer Field Schools (FFS), training programmes, exposure visits, and WhatsApp-based technical advisory services.

Assignment: Objectives and Key Evaluation Questions

The objectives of the midline assessment are:

1. Measure changes in farmer income, cost of cultivation, and productivity
2. Assess adoption and effectiveness of GAP, IPM, and bio-inputs
3. Evaluate improvements in soil health, water security, and resource use
4. Analyse institutional development (BRCs, FPOs, farmer collectives)
5. Assess technology adoption (Trace app, soil testing, advisory systems)
6. Evaluate cost-effectiveness and value-for-money
7. Identify gaps, risks, and scalability pathways

Key evaluation questions of the study are as follows:

- What changes have occurred in yield, income, and cost reduction?
- To what extent are sustainable practices adopted and sustained?
- Has water availability and soil health improved?
- How effective are BRCs and FPOs as local institutions?
- What is the impact of digital advisory and traceability systems?
- What is the cost per acre / farmer / outcome?
- Are outcomes scalable and replicable?

Methodology

The midline impact assessment adopted a mixed-method approach, combining quantitative surveys with qualitative enquiry to assess project outcomes, implementation processes, and farmers' experiences.

A structured household survey was administered to both project-supported demo farmers and non-participating turmeric farmers from the same geographical area to provide a comparative understanding of farming practices and outcomes. Of the 83 demo farmers, 34 farmers were selected using a simple random sampling approach. Since no sampling frame was available for non-participating farmers, they were identified through a snowball sampling technique.

To complement the survey findings, the study conducted four Focus Group Discussions (FGDs) across four project clusters, covering 32 farmers, including demo farmers as well as participants of the Farmer Field School (FFS) and WhatsApp advisory groups. The discussions were highly participatory and represented farmers with diverse educational backgrounds, ranging from basic literacy to graduates (B.Tech and B.Com), and across different age groups, from young farmers in their twenties to experienced farmers in their seventies. The FGDs followed a semi-structured discussion guide, allowing for both systematic enquiry and in-depth probing based on participants' responses.

A separate Focus Group Discussion was conducted with eight Bio-Resource Centre (BRC) farmers to understand the adoption, functionality, opportunities, and challenges associated with BRCs.

In addition, an FGD with the Gramodaya Project field team, including field executives and the agronomist, was undertaken to capture implementation experiences, operational challenges, and lessons from field engagement.

Key Informant Interviews (KIIs) were conducted with the leadership of the implementing partner, as well as the CSR and Business Development teams of Synthite Industries, to understand the project's strategic direction, implementation progress, institutional arrangements, and emerging priorities for the next phase.

The triangulation of quantitative evidence with qualitative insights enabled a comprehensive assessment of project performance, behavioural changes, implementation effectiveness, and areas requiring further strengthening.

During the field work the team reviewed infrastructure and also conducted a review of the Trace Ag App for further

Tool	**Target group**	**Nos**
Structured Survey	With beneficiary farmers particularly demo-plots	34 demo-plots
	With non-demo-plots farmers	30-32 non-demo
Focus group discussion	With farmers in the WhatsApp group – in each cluster	4 clusters
Key informant interview	With people involved in the implementation – CSR team, implementing agency team, local stakeholders, FPO team etc.	Total 4
Field observation: On the key research questions		
Review of the Trace Ag App		

The field study conducted between June 10-July 5 2026 in Kollegal.

CHAPTER 2

KEY FINDINGS

The study design has taken insights from the baseline, so that the direction of the project progression can be tracked/ assessed.

As per the baseline document, the project aims to:

Problem Statement	Intervention Strategy	Outcome Indicators
Lack of HYV seeds, excessive agrochemicals, low curcumin content	Capacity building, IPM practices, demo plots, BRCs	50% farmers adopt ≥2 sustainable practices
Severe drought, erratic rainfall, water depletion	Watershed activities, tank desilting, ponds	15% increase in groundwater table
Labor shortages, lack of access to technology	Introduce technologies for soil health, production efficiency	50% farmers access ≥1 new technology

Based on the baseline, the study has compiled some of the key impact areas, such as:

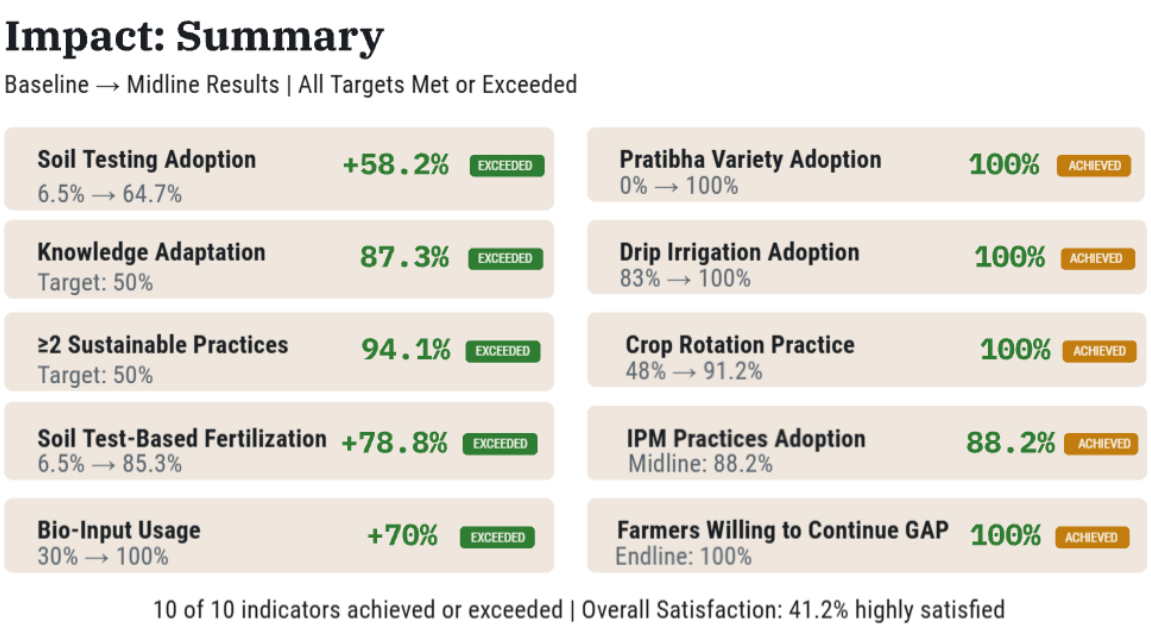
Baseline vs. Endline Comparison Project Focus Areas		
Parameter	Baseline Value	Midline Value
Average turmeric area	1.15 acres (36.5% of total land)	**1.6 acres** (31.2% of total land)
Soil testing awareness	98.7% aware, but only **6.5% tested**	100% aware and **64.7%** tested (100% followed recommendations)
Local variety usage	>80%	**30-50%** (shift to Pratibha variety)*
Peer-to-peer seed procurement	>90%	**40%** (Own harvest + other farmers) + **60%** from PPF/ Synthite)
Average seed rate	762–821 kg/acre	**680 kg/acre** (Pratibha variety)**
Banned pesticide usage	38% (Monophos, Ecalux Quinalphos)	**10%** still reported use of Quinalphos, but **70% farmers mentioned** Trichoderma, Jeevamrutha, agniastra application
Drip irrigation adoption	83%	**100%**
Average groundwater depth	412 feet	Not measured (94.1% reported reduced irrigation frequency)***
Average yield (dry)	2.5 MT/acre	**2.3 MT/acre** (dry)****
Post-harvest loss (soot deduction)	8% (₹27,000/acre loss)	4-5% (61.8% accessed boilers/ polishing units (loss reduction expected))
Bio-input usage	30%	**97.1%** (Compost & other bio inputs)

Demo farmers continue to cultivate 50–67% of the area with BSR Odisha/ Salem varieties, indicating a cautious transition to Prathibha.
*** Nine (27%) farmers who strictly followed the distancing and raised bed format as per the suggestions from the PPF team, reduced seed consumption to 600-65Kg/ acre based on their last years' experience. When rise bed and distancing has applied, seed quantity has been reduced in Prathibha and other varieties as well.*
****During the FGD & KII it is noted that the ground water is available beyond 500 feet. If there is no rain in this year, it will go beyond.*
***** Average yield of Prathibha variety is reported as 10.77 tons/ acre. Dry is calculated at 20% recovery rate. 2.5MT baseline is slightly questionable.*

Comparison: Baseline vs. Midline Review Outcomes

Outcome Indicator	Target	Baseline	Midline	Status
Farmers adopting ≥2 sustainable practices	50%	N/A	94.10%	☑ Exceeded
Soil testing adoption	50%	6.50%	64.70%	☑ Exceeded
Soil health index improvement*	50%	N/A	100%	☑ Exceeded
Yield improvement*	20%	N/A	88.20%	☑ Exceeded
Income increase from turmeric*	30%	N/A	82.40%	☑ Exceeded
Farmers with access to digital advisory	50%	N/A	100%	☑ Exceeded
Post-harvest loss reduction	10%	8%	4-5%	⏳ Pending
Groundwater table improvement	15%	412 ft	Not measured	⏳ Pending
Soil moisture improvement	10%	N/A	100%	⏳ Pending

* Self-reported



Profile of the Respondents

Profile of the Respondents (Midline) (n=34 farmers)

Characteristic	Distribution
Gender	97% Male, 3% Female
Average Age	47.3 years
Education	4th to Degree level
Farm Size	Marginal (8.8%), Small (52.9%), Medium (32.4%), Large (5.9%)
Average Total Land	5.2 acres
Average Turmeric Area	1.6 acres
Average Experience	16.8 years

Villages Covered

Village	No. of Farmers
Andipalya	2
Chikkinduvadi / Chikkindodi	5
Kandaiahnapalya	2
Doddamalapura	2
Ikkadahalli	6
Mathipura	6
Palya	2
Thelanur	2
Others (Sulemedu, Ajjipura, etc.)	7

CHAPTER 3

KNOWLEDGE AND CAPACITY BUILDING

Training is a major component of the project. According to farmers

- Nearly 44% of the farmers attended two GAP training sessions, making it the most common level of participation.
- About 29% attended only one training, while 27% attended three or more trainings.
- This includes FFS, and exposure visits.

On average, farmers attended 2.3 GAP training sessions, indicating moderate exposure to the project's capacity-building activities.

Though all respondents say that they adopted the insights from the trainings, three respondents said, they only adopted it partially as they were not ready to take any risk in altering their farming practices. They also said, they are on the process to implement it more intensely in the upcoming farming season. Whereas, most of the farmers mentioned that they have adopted the insights from the training sessions into other crops. Now, they realised that any tuber crops, a raise bed with proper mulching can increase the yield as the plant get better breathing space and hence, soil moisture retains for longer period.

Utility Rank	Frequency	Percentage (%)
1	4	11.8
2	6	17.6
3	8	23.5
4	9	26.5
5	7	20.6
Total	**34**	**100.00**

- Rank 4 was the most frequently assigned rating (26.5%), indicating that most farmers found the GAP training highly useful.
- 20.6% rated the training as very useful (Rank 5).
- The average utility score of 3.06 out of 5 suggests that farmers generally perceived the GAP training to be moderately to highly useful, with scope for further strengthening its effectiveness.

Farmer Field School (FFS) and Soil Testing trainings:

- Half of the farmers (50%) attended two Farmers Field School (FFS) sessions, making it the most common level of participation.
- 8.8% of the respondents had not attended any FFS session.
- On average, farmers attended 2 FFS sessions, indicating a moderate level of participation in field-based learning activities.
- The most common ratings were 2 and 4, each reported by 32.4% of respondents, indicating mixed perceptions of the usefulness of the Farmers Field School.
- 14.7% rated the FFS as very useful (Rank 5), while only 5.9% gave the lowest rating (Rank 1).

- The average utility score of 3.18 out of 5 suggests that farmers generally perceived the FFS to be moderately to highly useful, with varying experiences across participants.

Training to Adaptation

Project Component	Participation	Knowledge Adoption	Utility & Key Insights	Improvement Areas
PMDS Training	38.2% attended two sessions; 14.7% attended none.	79.4% adopted new knowledge; 17.6% partially.	Mean utility 3.18 (Rank 4 most common). Farmers noted rise in soil fertility & moisture retention due to PMDS crop cover.*	Strengthen field demonstrations and climate-adaptive planning.
Soil Testing	70.6% attended one or two sessions; 8.8% attended none.	97.1% adopted new knowledge **	Mean utility 3.12/5 (Rank 4 highest). Strong knowledge uptake but moderate perceived usefulness.	Increase follow-up on adoption of soil test recommendations.
Bio-Resource Centre (BRC)	38.2% attended two sessions; 29.4% one session; 14.7% none.	79.4% adopted; 14.7% partially; 5.9% no adoption.	Mean utility 3.00/5. Moderate usefulness, indicates the need for stronger practical sessions and follow-up support.	More hands-on demonstrations and post-training mentoring.
WhatsApp Advisory Group	52.9% attended one session; 29.4% did not participate.	82.4% adopted; 2.9% partially; 14.7% no adoption.	Mean utility 3.24/5 (Rank 4 highest). Effective platform for timely advisory & knowledge dissemination.***	Improve coverage and farmer engagement.
Water Conservation	32.4% attended two sessions; 23.5% attended none.	88.2% adopted; 2.9% partial; 8.8% no adoption.	Mean utility 3.10/5 (Rank 4 highest). Improved awareness adoption of water conservation practices.	Increase practical demonstrations and field support.
Pratibha Variety Seed	Highest participation: 32.4% attended four sessions; average 3.35 trainings/ farmer.	100% adopted new knowledge.	Highest-rated intervention (mean 3.91/5). Over 76% rated it 4–5, reflecting its strong relevance and practical value.	Scale up seed availability and on-field demonstrations.
Micro-Irrigation	41.2% attended two trainings; 8.8% attended none.	91.2% adopted; 8.8% partially.	Mean utility 3.24/5 (Rank 4 highest). Well received, though field demonstrations could further improve effectiveness.	Strengthen practical demonstrations and adoption support.
Exposure Visits	Most attended two visits (44.1%), followed by three visits (20.6%).****	94.1% adopted; 5.9% partially.	Mean utility 3.26/5. Farmers valued experiential learning and peer-to-peer exposure.	Increase peer learning and exposure to successful farms

** Success depended on timely pre-monsoon rainfall, with poor germination reported in low-rainfall areas.*

*** All those conducted soil testing reported following the recommendations, while three were unaware of the recommendations and two people did not follow them.*

**** Most of the farmers (25 respondents) received digital advisory support from the project team through WhatsApp or phone calls. It was highly valued by farmers as 80% rated it as Very Useful or Useful. Emphasised the importance of continuous advisory services in reinforcing training, addressing field-level issues, and supporting timely decision-making. Only 11.8% considered it to have limited usefulness.*

*****Two attended the Gulbarga Session.*

Based on the training data across all interventions, the project has generated strong knowledge transfer and moderate-to-high perceived usefulness among farmers. The overall findings are:

Area	Overall Impact
Participation	Farmers actively participated across multiple interventions. Attendance was highest for Pratibha variety seed training, followed by Exposure Visits, Micro-irrigation, and PMDS/BRC demonstrations, indicating sustained engagement with the project.
Knowledge Adoption	Knowledge uptake was consistently high across interventions, ranging from 79.4% to 100%. The highest adoption was reported for Pratibha seed training (100%), Soil Testing (97.1%), Exposure Visits (94.1%), and Micro-irrigation (91.2%), demonstrating that most farmers translated training into practice.
Perceived Usefulness	Utility scores ranged between 3.0 and 3.9 (out of 5), suggesting that farmers generally considered the interventions useful. Pratibha seed training (3.91) received the highest rating, followed by Exposure Visits (3.26), Micro-irrigation (3.24), WhatsApp Advisory (3.24), PMDS (3.18), Soil Testing (3.12), Water Conservation (3.10), and Bio-Resource Centre (3.00).
Behavioural Change	FGDs and field observations indicate that farmers are adopting improved agronomic practices such as intercropping, bio-input preparation, soil testing, water conservation, and micro-irrigation. Many also reported increased confidences in cultivating the Pratibha turmeric variety.
Experiential Learning	Practical interventions—including demonstrations, exposure visits, and field-based learning—were rated more favourably than classroom-style trainings, highlighting the importance of hands-on learning in promoting behavioural change.
Areas for Improvement	The relatively lower utility ratings for the Bio-Resource Centre, PMDS, and Water Conservation trainings suggest a need for more practical demonstrations, regular follow-up, and location-specific technical support. Climatic factors, particularly the availability of timely pre-monsoon rainfall, also influenced the effectiveness of PMDS demonstrations.

Overall, the Gramodaya project's capacity-building strategy has been highly effective in improving farmers' knowledge and encouraging the adoption of better agricultural practices. Nearly all interventions achieved over 80% knowledge adoption, demonstrating that the training package is relevant and technically sound.

The strongest impacts were observed in interventions that combined practical demonstrations, field exposure, and continuous advisory support, particularly the Pratibha variety seed training and Exposure Visits. Going forward, strengthening follow-up mentoring, increasing field demonstrations, and tailoring technical support to local agro-climatic conditions will further enhance adoption and sustain long-term behavioural change.

Knowledge Adaptation: Before vs. After

Practice	Was doing before	After the training	Attended, but didn't adapt	Will do next season	Not planning to adapt
Raised Bed Planting	11 (32.4%)	23 (67.6%)	0	0	0
PMDS	16 (47.1%)	17 (50.0%)	0	0	1 (2.9%)
Drip Irrigation	21 (61.8%)	13 (38.2%)	0	0	0
Mulching	18 (52.9%)	11 (32.4%)	0	0	5 (14.7%)
Intercropping	25 (73.5%)	9 (26.5%)	0	0	0
Bio-inputs	16 (47.1%)	18 (52.9%)	0	0	0
IPM Practices	11 (32.4%)	19 (55.9%)	0	0	4 (11.8%)
Soil Test-based Fertilizer Application	10 (29.4%)	21 (61.8%)	0	1 (2.9%)	2 (5.9%)
Seed Treatment	11 (32.4%)	19 (55.9%)	1 (2.9%)	2 (5.9%)	1 (2.9%)

- Highest behaviour change was observed in raised bed planting (67.6%), soil test-based fertilizer application (61.8%), IPM practices (55.9%), seed treatment (55.9%), bio-inputs (52.9%), and PMDS (50.0%).
- Intercropping (73.5%), raised bed planting (67.6%), and drip irrigation (61.8%) were already widely practised before the project.
- Mulching had the highest proportion (14.7%) of farmers not planning to adopt.
- Only one respondent reported attending the seed treatment training but not adopting the practice, while a small number planned to adopt soil test-based fertilizer application and seed treatment in the next season.

Impact: Perception of the Farmer

Indicator	Improved	Better	Reduced	No Change	Deteriorated
Soil Moisture	32 (94.1%)	0	1 (2.9%)	0	0
Crop Vigour	32 (94.1%)	2 (5.9%)	0	0	0
Root Growth	28 (82.4%)	2 (5.9%)	0	4 (11.8%)	0
Overall Change in Farming	30 (88.2%)	3 (8.8%)	0	1 (2.9%)	0
	Declined Significantly	**Declined**	**No change**	**Increased**	**Increased drastically**
Pest Attack	2 (5.9%)*	29 (85.3%)	3 (8.8%)	0	0
Irrigation Frequency	29 (85.3%)	1 (2.9%)	3 (8.8%)	0	1 (2.9%)
Fertilizer Need	0	30 (88.2%)*	2 (5.9%)	1 (2.9%)	1 (2.9%)
Weeding Days	1 (2.9%)	29 (85.3%)	2 (5.9%)	0	2 (5.9%)

**Not drastic requirement, there is a 10-20% decline. It is mainly reported by those who adopted PMDS during last crop season. As well as the use of soluble fertiliser helped to reduce the quantity applied and hence reflected significantly in the fertiliser cost.*

- Farmers reported substantial improvements across all agronomic indicators, with 82–94% indicating improvement in most parameters.
- The strongest improvements were observed in Crop Vigour (94.1%) and Soil Moisture (94.1%), followed by Overall Farming Practices (88.2%) and Fertilizer Requirement (88.2%) and decline in irrigation frequency (85.3%). Decline in irrigation frequency is mainly due to increased soil moisture, and better mulching in the initial days. Data also shows now, all farmers adopted drip irrigation against 83% in the baseline. While 90% use ground water, 7% depends on ponds and 3% on well water for irrigation.
- Pest attacks were reduced for 5.9% of farmers, while 85.3% also perceived overall improvement in pest management, however the overall pest attacks are less in tuber crops.
- Root growth showed the highest proportion reporting no change (11.8%), suggesting that improvements in below-ground crop performance may take longer to become visible.
- Only one respondent (2.9%) reported deterioration in weeding days, indicating minimal change.

Awareness on the fertiliser/ pesticide label

From land preparation farmers apply fertilizer to enrich soil quality. DAP/ NPK are the main components they apply as turmeric is a tuber crop. Compared to last crop cycle, farmers already experiencing doubling of price of the fertilizer in 2026. In the case of pesticide, turmeric experiences less pest attack, but bacterial and fungal infections occur, mostly due to water, soil/ manure contamination and related issues.

Fertilizer Application

Fertilizer Type	Farmers Using	Average Quantity
DAP	55.9%	3.4 sacks
Complex/NPK	35.3%	3.3 sacks
Potash/Potassium	29.4%	3.0 sacks

Nearly two-thirds (64.7%) of farmers reported checking fertilizer or pesticide labels before use. However, 17.6% did not check labels, while 17.6% either had no knowledge of labels or did not respond, indicating the need for greater awareness on safe agrochemical use.

Among respondents, 38.2% generally used Green Label products, while 29.4% used Yellow Label products. However, 32.4% reported that they had never checked the label, highlighting the need for continued awareness on pesticide classification and safe input selection.

Bio-Input Application

97.1% of farmers use cow dung and farm yard manure (FYM), indicating widespread adoption of organic inputs. Only a few farmers produce FYM in a scientific manner as vermicompost for better yield and plant protection. Although the project promotes only 20 BRCs, the use of bio-inputs is extensive. However, farmers need greater awareness on the scientific preparation and application of bio-inputs to minimize the risk of bacterial and viral contamination associated with improper use of cow dung, urine, and farmyard manure. The role of BRC is reinstate in providing guidance to produce bio inputs properly.

Access to Equipment and Infrastructure

Near one third of the respondents (62%) mentioned that they have accessed boilers/ polishing units. It was available on time for 77% of the respondents and half of them accessed it from Rithi Vedika FPO (FPO which was working with Pasidi Panda Foundation under Gramodaya Project), one fifth have own facilities and rest rented it from the local market.

Sales and Marketing

Farmers prefer to sell their harvest immediately after harvest to secure a good price. Delayed sales increase storage costs and weaken their bargaining power, particularly for those without access to proper storage and warehousing facilities. Local agents remain the primary buyers, followed by company representatives, while two FPOs also procure turmeric from farmers. Larger farmers occasionally transport dry turmeric directly to mandis, including the Salem–Erode market, to sell to companies, but this requires sufficient financial capacity and production volume. Smallholders, however, largely depend on farm-gate buyers for timely sales and immediate cash flow.

Sales Channels

Channel	Farmers Using
Dry turmeric to Agent	32.4%
Dry turmeric to Company	29.4%
Dry turmeric to FPO	23.5%
Wet turmeric to FPO	14.7%
Wet turmeric to Company	11.8%
Channel	Farmers Using

Diversification of sales channels compared to baseline (100% through middlemen). Still, agents remain a significant channel.

Marketing Changes

- Three-fourths (76.5%) of the farmers used a storage facility after harvest, indicating good adoption of post-harvest storage practices.
- PPF/Synthite was the primary storage provider (61.8%), demonstrating the project's important role in supporting post-harvest management.
- About 38.2% of farmers relied on their own storage facilities, indicating that a section of farmers already had storage infrastructure.
- Only 14.7% of farmers did not use any storage facility, while 8.8% did not respond.
- Improved access to storage enables farmers to avoid distress sales, maintain produce quality, and sell when market prices are more favourable, thereby enhancing farm income.

100% farmers reported improved market access, knowledge, and willingness to continue GAP practices.

CHAPTER 4

ECONOMICS OF TURMERIC CULTIVATION

The average cost of turmeric cultivation among the sampled farmers is ₹1,39,813 per acre. Labour (35.8%), fertilizer (19.2%), and seed (17.1%) together account for 72.1% of the total production cost, making them the key cost drivers. Findings from the FGDs and KIIs corroborate the survey results, with farmers consistently identifying labour and fertilizer as the most volatile and expensive inputs.

Labour demand is particularly high for raised-bed preparation, sowing, weeding, irrigation management, and harvesting, while only land preparation is largely mechanised. Most farmers depend on labourers from villages 20–30 km away, increasing costs through higher seasonal wages, transport, and food. Daily wages typically rise from ₹250–300 to ₹350–400 for women and ₹400–500 to ₹600–700 for men during peak season. Family labour, particularly women's involvement, remains limited as most households own 2–3 acres and women primarily engage in livestock management.

Several farmers highlighted mechanisation as a long-term solution, especially for raised-bed making, sowing, weeding, and harvesting. However, small landholdings make individual investment uneconomical. Farmers suggested that FPO-led custom hiring centres or rental services could improve access to suitable machinery, reduce labour shortages, lower cultivation costs, and shorten critical farm operations. One farmer planning to purchase a tractor also highlighted the lack of appropriate implements for turmeric cultivation.

Farmers reported that the adoption of Trichoderma, Pseudomonas, and other bio-inputs has already reduced fertilizer consumption by nearly one-third. However, the use of soluble fertilizers remains limited due to concerns about clogging micro-irrigation systems. Addressing this technical constraint could further improve nutrient-use efficiency and reduce fertilizer costs.

Pesticide expenditure remains relatively low (3.6%), reflecting increased use of bio-inputs and IPM practices, although some farmers had adopted IPM even before the project. Overall, the project interventions—soil test-based nutrient management, BRCs, PMDS, micro-irrigation, and the Pratibha seed variety—directly address the major cost components and have strong potential to improve profitability by reducing input costs and enhancing productivity.

Average Cost of Cultivation per Farmer (N = 34)

Cost Component	Total Cost (₹)	Average per Farmer (₹)	Share of Total Cost (%)
Labour/Coolie	24,00,000	50,000	**35.8**
Fertilizer	12,87,000	26,813	**19.2**
Seed	11,48,000	23,917	**17.1**
Land Preparation	6,17,000	12,854	9.2
Other Costs	5,27,000	10,979	7.9
Irrigation	4,90,000	10,208	7.3
Pesticides	2,42,000	5,042	3.6
Total	**67,11,000**	**1,39,813**	**100.0**

* Costs are approximate and based on farmers' recall during the survey.

Perceived Changes in Cultivation Costs

The survey also assessed farmers' perception of changes in individual cost components following project interventions.

- Overall cultivation cost: About 50% of farmers reported a reduction in total cultivation cost, while 30% observed no change and 20% reported an increase.
- Labour cost: Despite project interventions, nearly 80% of farmers reported increased labour costs, primarily due to labour shortages and rising market wages.
- Land preparation: Around 37% of farmers reported a significant reduction, reflecting improved farm operations and greater mechanisation.
- Irrigation cost: Nearly 60% reported a significant reduction, indicating benefits from micro-irrigation and improved water management.
- Fertilizer cost: About 50% experienced a significant reduction through soil test-based nutrient management and increased use of bio-inputs.
- Pesticide cost: Approximately 50% reported substantial reductions, reflecting greater adoption of IPM and biological pest management.
- Seed cost: Around 65% reported increased seed costs, largely due to the use of improved planting material, while 20% observed no change.
- Other operational costs: Responses were mixed, with 35.3% reporting significant reductions and 20.6% reporting increases.

The findings indicate that the project has been effective in reducing irrigation, fertilizer, and pesticide costs through improved agronomic practices. Therefore, this also indicate that labour, fertilizer, and seed costs offer the greatest opportunity for improving farm profitability. However, labour costs remain the single largest constraint, driven largely by external market conditions rather than project interventions. Consequently, promoting mechanisation through FPOs and custom hiring centres offers significant potential to further improve farm profitability. The project's interventions—including soil test-based nutrient management, bio-input production through BRCs, PMDS, micro-irrigation, and improved seed varieties (Pratibha)—are directly aligned with these major cost components. Over time, effective adoption of these practices is expected to optimize input use, reduce production costs, and improve farmers' net returns.

Yield and Income Analysis (Per Acre)

The estimated yield data indicate that farmers achieved an average fresh turmeric yield of around 10.14 tons per acre, equivalent to an average dry yield of about 1.9-2.6 tons per acre (assuming a conversion ratio of around 19%). Yield varied considerably across farmers, reflects differences in farm management, irrigation, soil fertility, and adoption of improved practices.

For income estimation, it is assumed that:

- 10–15% of fresh turmeric is retained as seed for the next season,
- Rest (minimum 5% is considered as soot) is in general sold as fresh produce at an average price of ₹30/kg, at an average price of ₹140/kg.

Estimated Yield and Income per Acre

For the estimation, we follow a very conservative approach. Farmers gave only a rough estimation of their yield. The cost of the produce is collected through the focus group discussions and interviews.

Indicator	Estimated Value
Average fresh yield	12.1 tons/acre
Average dry yield	2.2 tons/acre
Dry turmeric price @	₹140/kg*
Seed retained	10–15% of fresh yield (around 1.5-2.5 ton fresh)
Dry turmeric sold	75–80% of fresh yield (around 2.3 ton dry)

*Market price of dry was in a range of ₹135-155

Estimated Gross Income (Average Scenario)

Using a mid-range marketing pattern (15% retained as seed, 35% sold fresh and 45% processed into dry turmeric of 12.1 tons/ acre turmeric):

Source	Estimated Income (₹/acre)
Sale of dry turmeric	**₹3.00 lakh**
Total estimated gross income	**₹2.80-3.00 lakh/acre**
Total estimated net income	**₹2.8 or 3 – 1.4= 1.4 to 1.6 lakhs**

- Dry turmeric commands a much higher price (around five times that of fresh turmeric), but processing involves boiling, drying, storage, and transport costs. Several farmers reported that selling fresh turmeric as seed was more profitable, with two farmers said they earned around ₹3 lakh per acre after expenses.
- Retaining 10–15% of the harvest as seed reduces immediate cash income but lowers seed costs in the following season.
- Selling both fresh and dry turmeric helps diversify income, balancing immediate cash flow with higher-value processed sales.
- With an average cultivation cost of ₹1.4 lakh per acre, turmeric cultivation remains just rear profitable, although net returns depend on yield, market prices, processing costs, and farm size. Larger farms generally generate higher profits but also face greater financial risk.
- Intercropping with onion, garlic and chilly provides an additional income source. Farmers reported that income from these short-duration crops often covers labour costs, improving overall profitability from turmeric. However, returns depend heavily on market prices, and in low-price years, some farmers leave the crop unharvested**.**
- While most farmers experienced improved turmeric yield and income, their expansion plans remain cautious. They intend to dedicate only 30–50% of their farmland to turmeric, citing uncertainties around climate variability and future price volatility.

CHAPTER 5

INSTITUTION DEVELOPMENT: BRCS AND FPO

Sustainability of any intervention is ensured through promoting institutions and giving it a purpose for the community to take it forward. Under Gramodaya, two institutions are promoted – Bio-Resource Centre (BRCs) and Farmer Producer Organisations (FPOs). While BRC are promoted through intense training and handholding support during the formation, FPO is not promoted, it is identified and collaborated for post-harvest activities.

Bio-Resource Centres (BRCs)

The Gramodaya Project has established 20 Bio-Resource Centres (BRCs) to promote the production and use of bio-inputs for sustainable turmeric cultivation. As part of the midline assessment, the evaluation team visited four BRCs and conducted Focus Group Discussions (FGDs) with BRC farmers to understand their functionality, adoption, and future potential.

The field assessment indicates that the BRCs have successfully enhanced farmers' knowledge and confidence in producing bio-inputs. One farmer, who participated in the project's first exposure visit to Gulbarga, explained that the visit transformed his understanding of on-farm bio-input production. The technical training and material support provided by the project enabled him to establish a BRC and gradually reduce dependence on chemical fertilizers.

The assessment found that most BRC owners are cattle farmers, enabling them to effectively utilise locally available farm residues such as maize stalks, sugarcane trash, coconut waste, and turmeric residues for compost preparation. BRCs primarily produce vermicompost, Jeevamrutha, Agniastra, and other bio-inputs, which are used not only in turmeric cultivation but also in coconut, sugarcane, and vegetable farming. Farmers reported noticeable improvements in soil quality, plant vigour, and reduced dependence on chemical fertilizers.

Survey findings further show that 94% of respondents were aware of the Bio-Resource Centres, indicating strong outreach of the intervention. However, production remains largely need-based and for self-consumption rather than commercial sale. BRC owners explained that production is usually undertaken only when required, and any surplus is informally shared with neighbouring farmers or relatives. Although several farmers expressed willingness to commercialise bio-input production, products such as Jeevamrutha and Agniastra have a short shelf life, limiting their marketability without appropriate preservation or organised marketing systems.

A notable finding from the FGDs was the growing interest in bio-inputs due to the sharp increase in chemical fertilizer prices during the current season. Farmers repeatedly stated that they intend to expand the production of vermicompost and Jeevamrutha to reduce cultivation costs. In one village, farmers without BRCs had already begun purchasing vermicompost from local suppliers as an alternative to chemical fertilizers. The assessment team also observed newly displayed advertisements for commercial vermicompost suppliers in several villages, suggesting an emerging local market for bio-inputs.

Despite these positive developments, the assessment identified several operational challenges:

- Some BRCs were not fully functional due to the lack of microbial inoculants and regular technical support.

- Bio-input preparation was perceived as labour-intensive and time-consuming, discouraging continuous production.
- Production remains largely household-based, with limited involvement of women and other family members, constraining the scale and sustainability of the enterprise.
- The absence of organised demand, quality standards, and marketing channels has limited the commercial potential of BRCs.

Overall, the midline assessment suggests that the Bio-Resource Centre is one of the project's most promising interventions, with significant potential to reduce fertilizer costs, improve soil health, and strengthen climate-resilient farming. However, this potential remains only partially realised. Strengthening technical handholding, ensuring regular access to inoculants, promoting greater family participation—particularly women—and developing local market linkages or FPO-led business models could transform BRCs from a subsistence activity into a sustainable rural enterprise while further reducing farmers' dependence on external agricultural inputs.

Farmer Producer Organisation (FPO)

Strengthening the FPO was introduced in Year 2 to improve aggregation, post-harvest management, and market linkages. An MoU was signed with an existing FPO to facilitate procurement, grading, storage, and marketing of turmeric. The midline assessment indicates that while the FPO has strong potential, it remains at an early stage of institutional development and requires significant capacity strengthening.

Key insights from the qualitative study

- The FPO currently functions more as a legal entity than a farmer-owned institution, with operations largely driven by a single individual.
- The implementing agency provided extensive handholding during procurement and post-harvest activities, indicating limited independent operational capacity.
- Inadequate working capital constrained timely procurement and payments, affecting farmer confidence.
- Farmers continue to associate project activities with the implementing agency rather than the FPO, reflecting weak leadership visibility and member engagement.
- While farmers recognise the need for a collective institution, their participation depends largely on visible economic benefits.
- The FPO lacks a young entrepreneurial leadership team despite the presence of progressive young farmers in the project.
- A multi-commodity business model is appropriate for long-term commercial viability, with turmeric serving as the flagship value chain.

Overall, the project has successfully integrated the FPO into procurement and marketing, but it has yet to evolve into a self-sustaining farmer-owned enterprise. The current challenges reflect capacity gaps rather than lack of relevance. Based on these observations, to improve any engagement such as FPO for the continuity of the program, the following recommendation are proposed.

- Build a committed entrepreneurial leadership team, particularly by engaging progressive young farmers.
- Strengthen governance, financial management, procurement, accounting, and market negotiation capacities.

- Develop a phased business and financial sustainability plan, including mechanisms for working capital mobilisation.
- Position the FPO as the primary interface between farmers, markets, input suppliers, and technical service providers, gradually reducing dependence on the implementing agency.
- Continue the multi-commodity approach while strengthening turmeric through traceability, quality assurance, and private market linkages.

The assessment concludes that the FPO should remain a core component of the Gramodaya project. The next phase should prioritise institutional strengthening so that it evolves into an independent, professionally managed, and commercially viable farmer organisation capable of sustaining project outcomes beyond the CSR support period.

Women's Participation

Women's participation in the project remai**ns limited. Among the demonstration farmers, only two were women,** and during the FGDs one woman participant was represented by her husband, reflecting their limited visibility in farm decision-making. Discussions revealed that women in small and medium farming households primarily contribute through livestock management and occasional farm labour, while decisions related to crop production are largely taken by men. In households with larger landholdings (above two acres), women's involvement in field operations is even lower.

FGDs also highlighted practical and socio-cultural barriers. Women have limited time to participate in project activities due to household responsibilities and cattle management, while prevailing social norms continue to restrict their role in agricultural decision-making. However, the assessment also identified examples of women's leadership, including a successful woman procurement agent in Kollegal, demonstrating that women can effectively manage agricultural enterprises when opportunities and support are available.

The findings suggest that the project has not yet systematically integrated a gender strategy. The next phase should place greater emphasis on women's participation, particularly in Bio-Resource Centre (BRC) management, bio-input production, post-harvest activities, value addition, and farmer collectives, where their involvement is more feasible. Targeted capacity building, women-focused training, and dedicated livelihood opportunities would not only enhance women's economic participation but also strengthen the sustainability of project outcomes.

CHAPTER 6

ADOPTION OF SUSTAINABLE AGRICULTURAL PRACTICES

Experience with the Gramodaya Project

The midline assessment indicates that the Gramodaya Project has made significant progress in promoting sustainable turmeric cultivation through improved farmer knowledge, adoption of Good Agricultural Practices (GAP), bio-inputs, soil and water management, and technical advisory support. High levels of farmer satisfaction, willingness to continue project interventions, and knowledge sharing reflect strong prospects for sustainability.

- 100% of respondents reported that the project improved market access, enhanced their knowledge of sustainable farming, and expressed their willingness to continue Good Agricultural Practices (GAP) even without project support, indicating strong ownership and sustainability of project outcomes.
- Knowledge diffusion was high, with 97.1% of farmers reporting that they had shared project learnings with other farmers, suggesting strong peer-to-peer extension.
- Community networking improved substantially, with 97.1% acknowledging that the project strengthened farmer networks and collective engagement.
- Overall satisfaction was very high, with 97.1% of respondents reporting being either Highly Satisfied (47.1%) or Satisfied (50.0%), while only 2.9% expressed dissatisfaction.
- All respondents suggested scaling up of Gramodaya in other villages. As they are experiencing such agronomy related advisory support on an accessible manner for the first time.
- These findings demonstrate that the project has generated strong behavioural change, social capital, and farmer confidence, creating favourable conditions for sustaining project interventions beyond the funding period.

However, the assessment also identifies key areas for improvement, including reducing labour dependency through mechanisation, strengthening Bio-Resource Centres (BRCs), enhancing women's participation, and improving market and post-harvest support. Addressing these gaps during the remaining project period will help consolidate project gains and maximise long-term impact.

In short, the findings indicate that the project has generated strong farmer confidence and satisfaction. While challenges related to labour availability and climate variability persist, farmers perceive these as external constraints rather than project shortcomings. The demand for continued technical guidance, combined with universal support for scaling the intervention, suggests that the project has established a strong foundation for long-term adoption of sustainable farming practices and community-led dissemination of knowledge.

Reflections of the Demo-Farmers on Gramodaya's Intervention Goal

Indicator	Percentage
Market access improved	100%
Knowledge on sustainable farming improved	100%
Shared learnings with other farmers	100%
Willing to continue GAP without support	100%
Women involved in farming decisions	85.3%
Improved networking/community engagement	100%

The findings indicate strong farmer acceptance of the Gramodaya Project. Nearly all respondents (97.1%) were either satisfied or highly satisfied, and 100% recommended scaling the project to other villages, reflecting high confidence in its relevance and benefits.

Major Challenges of the Farmers

To know the unmet needs of the farmers, the study also raised questions on the major challenges they are grappling with. They identified labour shortage/ high labour cost, rainfall/ weather uncertainty (they didn't get pre-monsoon and even monsoon is very weak), marketing/ agent issues (prefer to have buyer as soon as the harvest is done, plus timely availability of boilers and polishing machine is a big challenge), need timely technical advisory, water supply/ irrigation issues as major issues that they need support.

Farmers also highlighted the need for continued support to address key production and marketing challenges. They noted that, just as technical advisory is limited, reliable market support is equally critical to ensure timely sale of produce at fair market prices. Many farmers expressed the need for assured procurement mechanisms, which would significantly reduce marketing uncertainty.

They also reported limited awareness of government schemes, as visiting agriculture offices regularly is often not feasible. A structured information-sharing mechanism on government programmes would therefore be valuable. Given the persistent labour shortage, farmers further requested access to affordable rental machinery for operations such as land preparation, raised-bed making, sowing, and harvesting, which could reduce labour dependence and improve operational efficiency.

Suggestion	Frequency (n.34)
More agricultural training and technical guidance	**34**
Marketing support	**30**
Information on government schemes	**25**
Labour support/mechanisation	**34**

All these challenges reported were largely external to the project, particularly labour shortages, rising labour costs, and erratic rainfall. Consequently, farmers' suggestions focused less on redesigning the project and more on continued technical guidance, particularly on sustainable cultivation practices, input management, and access to agricultural information. A few respondents also suggested improving market linkages, access to government schemes, and mechanisation support.

Overall, the feedback demonstrates that the project has built strong farmer trust and acceptance. The next phase should focus on strengthening advisory services, addressing labour-related constraints through mechanisation, improving market support, and enhancing climate resilience to sustain and scale the project's impact.

Note on Governance and Project Implementation

The midline assessment reveals a classic paradox that the project has achieved remarkable social capital on the ground, yet its foundational governance and monitoring architecture remains fragile. While the field team has successfully built trust and filled a critical void left by the public extension system—with FFS and WhatsApp groups emerging as vital correctives to misinformation—these operational wins mask deeper structural weaknesses that, if unaddressed, will cap the project's long-term impact.

Key Implementation Gaps:

1. Untimely Inception: Launching mid-cycle (2024) crippled early adoption of GAP, as farmers were already committed to standing crops. This was an avoidable strategic error.

2. Ambiguous Governance and Recruitment Delays: The three-tier structure (Satvva, Vruthi, PPF) created a diffusion of accountability. With no formal monitoring framework, periodic reviews, or mandated field visits in Year 1, oversight was effectively absent. Critically, the core implementation team was only fully recruited 10–12 months into Phase I—a delay that rendered the initial period largely unproductive from a data and compliance perspective.
3. Misaligned Commercial Engagement: Instead of strengthening the FPO, the implementation team has directly engaged in business development activities in order to facilitate the business goals. This is a governance red flag. The CSR mandate must remain distinct from commercial interests; all business-linked engagements should be transferred to the FPO or independent for-profit entities, with no direct operational linkage to the implementing NGO.
4. Underutilised Technology: The Trace Ag App exists but is deployed superficially. Its potential for real-time dashboards, carbon footprint quantification, and batch-level traceability remains largely untapped—a significant missed opportunity for ESG credibility.

Restructuring in Year 2: The Turning Point

Performance improved markedly once accountability was consolidated under the PPF team and monthly activity-cum-financial reviews were instituted. The subsequent scaling to 4,000 acres in the current cycle is a direct testament to the credibility earned.

To transition from a well-intentioned intervention to a rigorously governed, impact-driven model, the following course corrections are imperative:

1. Lock the Governance Model: Formalise and freeze the current PPF-led structure. Ensure clear, written Terms of Reference (ToRs) for all tiers to eliminate role ambiguity. Continuity is non-negotiable for sustaining farmer trust.
2. Digitise Monitoring Rigorously: Mandate the full-scale deployment of the Trace Ag App—not as a data-entry tool, but as a strategic command centre. Develop a live dashboard with KPIs for soil health, input efficiency, yield tracking, and activity completion. Monitoring must shift from periodic physical visits to continuous digital oversight, with field visits reserved for verification and course-correction. In this process involvement of sustainability reporting team is essential.
3. Ensure the disintegration of Commercial Interest: Consider Gramodaya as a CSR engagement, any business achievement is a spill over outcome of the project, not the goal. Therefore, ensure all business development support is handled by the FPO, with clear capacity-building milestones. The CSR team must internalise the distinction between philanthropy (non-reciprocal) and strategic CSR (impact-linked); this project must operate firmly in the latter.
4. Conduct Activity-Based Costing: Commission a bottom-up review of per-activity costs to assess financial feasibility and unit economics. Without this, scalability remains an act of faith rather than a data-backed strategy.
5. Strengthen ESG Data Architecture: Leverage the Trace Ag App to generate auditable ESG metrics—water footprint, carbon sequestration, income differentials, and compliance records. This will transform Gramodaya from a rural development project into a verifiable sustainability asset, enhancing Synthite's brand equity and investor confidence.

The Gramodaya project has demonstrated undeniable grassroots efficacy. However, to realise its full potential, the governance apparatus must catch up to the field team's performance. The next phase must prioritise structural clarity, technological integration, and commercial neutrality—or risk squandering the credibility so painstakingly built.

CHAPTER 7

KEY LEARNINGS, IMPACT, CHALLENGES, RECOMMENDATIONS AND CONCLUSION

Key Learning

- Demonstration-Based Extension Works: Farmer-centric, hands-on training combined with continuous handholding (via FFS and WhatsApp) is significantly more effective than one-time classroom trainings in driving behavioural change.

- Visible Impact Drives Adoption: Farmers adopt sustainable practices when they observe tangible improvements in crop health, soil moisture, and profitability within a single season.

- Synergistic Interventions: Soil testing, bio-inputs, and improved seed varieties are mutually reinforcing. When introduced together, they enhance productivity while reducing dependence on costly chemical inputs.

- Bio-Resource Centre (BRCs): The BRC model has strong potential but currently functions largely for self-consumption; its livelihood and enterprise potential remains underutilised.

- Peer-to-Peer Diffusion is Powerful: Farmer-to-farmer knowledge sharing has emerged as a primary scaling mechanism. Around 97% of farmers shared learnings indicates that the project has created an informal extension network that outlasts direct project contact.

- Institutions Require Intensive Handholding: Both BRCs and FPOs remain dependent on the implementing agency. While they hold strong potential, they require structured business development support and governance clarity to transition from project-dependent entities to self-sustaining enterprises.

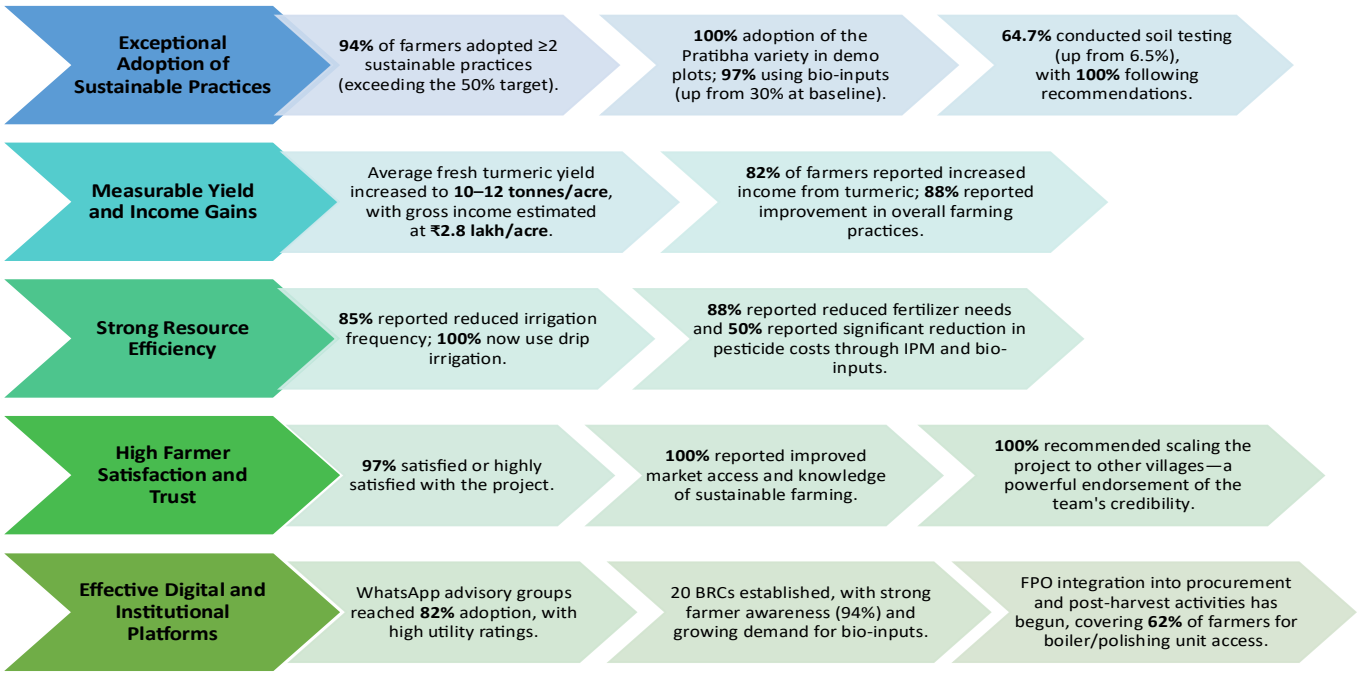
- External Factors Overwhelm Internal Gains: While technical interventions successfully reduced irrigation, fertilizer, and pesticide costs, labour shortages and rising wages continue to be the single largest external constraint on profitability, followed by climate variability.

- Gender Integration is an Afterthought: The project's success in technical adoption has not yet been matched by meaningful women's participation, highlighting the need for a deliberate gender strategy rather than assuming trickle-down benefits.

- Post-Harvest Support is Essential: Market-led sustainable agriculture requires stronger post-harvest support, storage, value addition, and collective marketing alongside production interventions.

Key Achievements

The project has made notable achievements within the short period as per the recall and the data shared by the farmers during both quantitative and qualitative study.



Key Impacts

Short-term Impacts (Observed at Midline)

- High adoption of Good Agricultural Practices (GAP), soil testing, and bio-inputs.
- Improved soil moisture, crop vigour, root growth, and pest management.
- Reduced expenditure on fertilizers, pesticides, and irrigation among a majority of farmers.
- Increased awareness and adoption of sustainable farming practices.
- Improved access to technical advisory and digital extension support.
- Strong farmer satisfaction, confidence, and willingness to continue project interventions.
- Increased networking and knowledge sharing among farmers.

Medium-term Impacts (Emerging)

- Higher turmeric productivity and improved crop quality.
- Better nutrient management through soil-test-based fertilizer application.
- Gradual shift from chemical inputs towards integrated nutrient and pest management.
- Improved profitability through optimized input use and better resource efficiency.
- Increased use of BRC-produced bio-inputs across multiple crops.
- Strengthened farmer institutions and potential for collective marketing.

Long-term Impacts (Expected)

- Improved soil health and long-term farm sustainability.
- Reduced dependence on chemical fertilizers and pesticides.
- Climate-resilient turmeric production through efficient water and nutrient management.
- Development of local bio-input enterprises through BRCs.
- Increased and more stable farm incomes.
- Stronger FPO-led aggregation, value addition, and market integration.
- Replicable model for sustainable turmeric cultivation across other regions.

Key Challenges

- Governance Gap: Delayed recruitment (10–12 months into Phase I) and ambiguous three-tier structure resulted in weak monitoring, no periodic reviews, and lost data collection opportunities.
- Monitoring Gap: Trace Ag App remains underutilised—a significant missed opportunity for real-time ESG dashboards and batch traceability.

- Persistent Labour Crisis: Labour costs account for 35.8% of total cultivation cost, with 80% of farmers reporting increased wages. Labour shortages are acute during peak seasons, and smallholders cannot afford mechanisation individually.
- Climate and Water Stress: Erratic monsoon (failed pre-monsoon in 2026) and groundwater depletion beyond 500 feet pose serious risks. Groundwater improvement—a key project target—remains unmeasured.
- Institutional Fragility:
    - BRCs are operational but largely for self-consumption; lack commercial viability, quality standards, and marketing channels.
    - FPO functions as a legal entity rather than a farmer-owned institution, driven by a single individual, with weak governance and inadequate working capital.
    - Farmers continue to depend on local traders due to limited organised market access.
    - Storage, processing, and value addition facilities require further strengthening.
- Limited Women's Participation: Only 2 of 34 sampled demo farmers were women. Women's participation in FGDs and decision-making is marginal, constrained by socio-cultural norms and household responsibilities.
- Commercial Ambiguity: The implementation team's engagement in Synthite's business development activities, rather than exclusive focus on FPO strengthening, blurs the CSR-commercial line and risks undermining the project's developmental integrity.
- Land Size Restricts Mechanisation: Mechanisation options suitable for small and medium-sized turmeric farms remain limited.
- Technical Advisory from Reputed Source: Continued technical support is needed for wider adoption of soluble fertilizers, advanced bio-inputs, and precision farming practices.

Recommendations (Way Forward)

Strengthen Sustainable Agriculture/ GAP Activities

- Continue regular field demonstrations, refresher trainings, and farmer advisory services.
- Expand soil testing and customized nutrient management for all project farmers.
- Promote wider adoption of bio-inputs and integrated nutrient management.

Improve Farm Economics

- Establish FPO-led custom hiring centres for farm machinery particularly turmeric-specific.
- Promote small-scale mechanisation suitable for raised-bed farming.
- Strengthen collective procurement of inputs to reduce production costs.

Strengthen BRCs

- Develop selected BRCs as village-level bio-input enterprises.
- Ensure regular supply of inoculum and technical mentoring.
- Build business and marketing capacities of BRC operators.
- Develop local market linkages and quality standards to enable commercial sale of vermicompost and bio-inputs.

Improve Market Linkages

- Strengthen FPO-led aggregation, grading, storage, and collective marketing.
- Promote value addition and branding of turmeric products.
- Improve access to market intelligence and price information.
- Promote and include a young entrepreneurial leadership team.
- Develop a phased business plan with working capital mechanisms.
- Position the FPO as the primary interface for procurement, marketing, and input supply, gradually reducing NGO dependence.

Increase Women's Participation

- Promote women-led BRCs, nursery development, seed treatment, and value addition activities.
- Design women-focused capacity-building programmes linked to income generation.
- Set measurable targets for women's participation in training, FPO leadership, and income generation.

Conduct Activity-Based Costing

- Commission a bottom-up review of per-activity costs to assess unit economics and financial feasibility.
- Scalability must be data-backed, not aspirational.

Strengthen Project Sustainability

- Continue digital advisory and farmer-to-farmer extension mechanisms.
- Develop climate-resilient farming strategies focusing on water conservation and soil health.
- Scale the model to neighbouring villages through demonstration farmers and FPO networks.

Strengthen ESG Data Architecture

- Shift from perception-based reporting to verified, auditable indicators: carbon footprint, water productivity, soil organic carbon, women's economic participation, BRC enterprise performance, and FPO governance.
- Align with GRI, BRSR, and SDG frameworks.

Institutionalise the Governance Model

- Finalise and formalise the implementation model, ideally involving an NGO with clear Terms of Reference (ToRs) with reporting, data collection directives.
- Ensure the CSR team internalises the distinction between philanthropy and strategic CSR, keeping commercial goals as spillover outcomes, not project objectives.

Fully Deploy the Trace Ag App as a Command Centre

- Utilise the full potential of Trace Ag App for project tracking and monitoring.
- Collect data for a live dashboard tracking KPIs: soil health, input efficiency, yield, activity completion, and ESG metrics.
- Shift monitoring from periodic visits to continuous digital oversight, with field visits for verification and course-correction.

Conclusion

The Gramodaya project has demonstrated undeniable grassroots efficacy in its first 18 months. Through a combination of high-quality technical training, trusted field staff, and farmer-centric advisory systems, the project has achieved remarkable progress in sustainable practice adoption, yield improvement, and farmer satisfaction—often exceeding its own targets. The rapid scaling to 4,000 acres in the current cycle is a testament to the credibility the project has earned among the farming community.

However, the project now stands at a critical inflection point. The operational wins on the ground are not yet matched by a robust governance and monitoring architecture, and the institutional foundations—BRCs, FPOs, and gender inclusion—remain fragile. The underutilisation of the Trace Ag App and the ambiguity between CSR and commercial objectives pose risks to long-term sustainability and ESG credibility.

The path forward is clear: consolidate the governance model, digitise monitoring rigorously, institutionalise the FPO, commercialise BRCs, and mainstream gender. If the next phase prioritises structural clarity, technological integration, and institutional strengthening over mere activity completion, Gramodaya has the potential to evolve from a well-intentioned rural development project into a verifiable, scalable, and auditable model for sustainable spice sourcing—one that enhances Synthite's brand equity, meets global ESG standards, and delivers lasting prosperity to farming communities.

The foundation is strong. The credibility is earned. Now is the time to build the architecture that will sustain it.

ANNEXURE 1

INSIGHTS FROM THE NON-PARTICIPANT FARMER SURVEY

The objective of surveying 32 farmers in the non-intervention villages is twofold:

1. To examine the level of understanding and adoption of good agricultural practices (GAPs) among farmers in villages where the Gramodaya project has not yet been implemented; and
2. To assess whether any knowledge transfer has occurred to these farmers via their peers who are part of the project.

The key insights emerging from this analysis are outlined below.

Profile of Farmers from the non-intervention villages

Characteristic	Value
Typical Farmer	Male, 45 years, 6th-10th education (3 are degree holders)
Farm Size	3.25 acres total, 1.22 acres turmeric
Experience	11.6 years in turmeric farming
Adoption Level	Moderate (42.5% overall GAP adoption)
Irrigation	Ground water with drip/sprinkler (78.1%)
Variety	Pratibha (31.3%) - low adoption
Market Linkage	Weak (only 18.8% in FPO)
Bio-input Usage	High (62.5% procuring)
Total Cost	₹159,188/acre
Yield	4.2 tonnes fresh/acre

Thes analysis shows the awareness and adoption patterns of 32 non-demo turmeric farmers across various good agricultural practices promoted under the Gramodaya project. The data reveals interesting insights into farmers' knowledge levels, technology uptake, and the gap between awareness and actual adoption of improved practices.

Awareness Levels

The awareness levels among non-demo farmers shows a mixed picture. Pratibha variety seed details (84.4%), inter-cropping (78.1%), mulching (78.1%), and seed treatment (78.1%) recorded the highest awareness levels, indicating that these practices are relatively well-known among the farming community. This can be attributed to extension efforts, peer-to-peer learning, and the long-standing presence of these practices in the region.

On the other hand, micro irrigation (12.5%), and PMDS (21.9%) showed critically low awareness levels. The low awareness of these two suggests limited exposure to this practice, possibly due to its recent introduction or limited project reach in non-demo areas.

Adoption Rates

The adoption rates present a more nuanced picture. Inter-cropping (65.6%), drip irrigation (62.5%), and bio-inputs (53.1%) emerged as the most widely adopted practices. The high adoption of inter-cropping and bio-inputs likely reflects their low-cost nature, immediate benefits, and compatibility with existing farming systems.

Conversely, PMDS (3.1%), micro irrigation (6.3%), water conservation (15.6%), and raised bed planting (15.6%) recorded the lowest adoption rates. These practices typically require higher initial investment, specialized knowledge, or significant behavioural change, which may explain their limited uptake.

Activity	Awareness (%)	Adoption (%)	Conversion Rate (Adopted/Aware)
Micro Irrigation	12.5	6.3	50.0
Pratibha Variety	84.4	31.3	37.0
Inter-cropping	78.1	65.6	84.0
Drip Irrigation	68.8	62.5	90.9
Soil Test Fertilizer	68.8	50.0	72.7
Water Conservation	46.9	15.6	33.3
PMDS	21.9	3.1	14.3
Raised Bed Planting	46.9	15.6	33.3`
IPM Practices	65.6	46.9	71.4
Soil Testing	62.5	28.1	45.0
Bio-inputs	68.8	53.1	77.3
Mulching	78.1	46.9	60.0
Seed Treatment	78.1	40.6	52.0

Conversion Efficiency

The conversion rate from awareness to adoption reveals interesting patterns:

High conversion practices (>75%): Drip irrigation (90.9%), Inter-cropping (84.0%), Bio-inputs (77.3%), and Soil test-based fertilizer (72.7%). These practices demonstrate that once farmers become aware of these practices, they are highly likely to adopt them, suggesting that the practices are perceived as beneficial, feasible, and cost-effective.

Low conversion practices (<50%): PMDS (14.3%), Water conservation (33.3%), Raised bed planting (33.3%), and Pratibha variety (37.0%). The low conversion rates suggest significant barriers to adoption, including cost constraints (mMicro irrigation and raised bed planting require capital investment), infrastructure gaps (water conservation practices may need collective action or community investment), risk perception (new varieties like Pratibha may carry perceived risks for small farmers) and complexity (PMDS requires specialized knowledge and skills).

Awareness-Adoption Gap

Practice	Gap (%)	Interpretation
Pratibha Variety	53.1%	Very High Gap - Knowledge not translating to action
Seed Treatment	37.5%	High Gap - Implementation barriers
Soil Testing	34.4%	Moderate Gap - Access or cost issues
Water Conservation	31.3%	Moderate Gap - Infrastructure needs
Micro Irrigation	6.2%	Low Gap - Limited awareness
Inter-cropping	12.5%	Low Gap - Well-established practice

Priority Areas for Intervention

Based on the gap analysis, the following priorities emerge:

- **High Priority (Need awareness + adoption support):** PMDS and PMDS Demonstration, Water Conservation Activities, Raised Bed Planting, and Micro Irrigation
- **Medium Priority (Need adoption support):** Pratibha Variety (High awareness, low adoption), Soil Testing (Moderate awareness, low adoption), and Seed Treatment (High awareness, low adoption)
- **Low Priority (Maintain current approach):** Inter-cropping, Drip Irrigation, and Bio-inputs

Potential Areas for Project Implementation

Awareness Generation: The analysis suggests that while awareness campaigns have been partially effective, there is a need for targeted communication on practices like PMDS, micro irrigation, and water conservation. These practices require more intensive demonstration and exposure to generate interest and understanding among farmers.
Adoption Support: The significant awareness-adoption gaps for practices like Pratibha variety and seed treatment indicate the need for:

- **Demonstration plots** to show practical benefits
- **Input subsidies or credit linkages** to overcome cost barriers
- **Technical backstopping** to address implementation challenges
- **Peer-to-peer learning** to build confidence

Infrastructure and Institutional Support: Practices such as water conservation and raised bed planting likely require:

- Community-level infrastructure
- Access to appropriate equipment
- Institutional support for collective action

Conclusion

The non-demo farmers show moderate to high awareness of most promoted practices, with awareness levels ranging from 9.4% to 84.4%. However, adoption rates remain significantly lower, with only 53.1% of farmers adopting bio-inputs and 65.6% adopting inter-cropping as the most adopted practices.

The gap between awareness and adoption is most pronounced for advanced practices requiring investment, specialized knowledge, or significant behavioral change. This suggests that while farmers are

aware of improved practices, various constraints - economic, technical, and institutional - prevent them from adopting these practices.

The findings underscore the importance of:

1. **Strengthening demonstration efforts** for practices with high awareness but low adoption
2. **Providing targeted support** for practices requiring investment or specialized skills
3. **Leveraging successful practices** (inter-cropping, drip irrigation, bio-inputs) as entry points for introducing other improvements
4. **Addressing infrastructure gaps** for practices like water conservation and raised bed planting

The relatively low adoption of practices in the non-demo group when compared to demo farmers also highlights the value of intensive support and training in driving technology adoption among smallholder farmers.

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Disclaimer

This midline impact assessment report is based on fieldwork conducted from June 10 to July 5, 2026. The findings are derived from primary data collected through surveys, focus group discussions, and key informant interviews. While every effort has been made to ensure accuracy, the study relies on farmer recall and self-reported information, which may be subject to bias. The sampling methodology—simple random sampling for demo farmers and snowball sampling for non-demo farmers—limits the statistical generalisability of the findings. This report is intended for internal use by the Gramedia project stakeholders for programmatic learning and decision-making. It does not constitute definitive impact attribution nor should it be used for legal or financial purposes without independent validation.

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