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## An Assessment of Tribal Incomes from Non-Timber Forest Products (NTFPs) in Ten Districts of Jharkhand and Odisha



**Common  
Ground**

2025

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# 01. Preface

The Covenant Centre for Development (CCD) has long believed that the knowledge and livelihoods of indigenous communities hold vital keys to sustainable futures. The Medicinal Plant Study conducted across Jharkhand and Odisha reflects this conviction, born from deep engagement with forest-dwelling communities and their relationship with non-timber forest produce (NTFP).

Today, many community lands secured under the Forest Rights Act—once thriving ecological and cultural commons—are facing rapid degradation. Well-meaning employment programs like MGNREGA have inadvertently contributed to the loss of indigenous medicinal flora by classifying them as weeds during routine de-weeding of commons, canal bunds, and roadsides. The unchecked spread of invasive species, combined with the push toward monocropping of exotic vegetables under market pressure, has displaced diverse native species that once supported local health traditions and biodiversity. This ecological loss is not just about disappearing plants—it is the erosion of centuries of knowledge, rituals, and practices that have sustained rural health systems, especially among tribal communities.

In addition to identification of key species collected in the operational areas, I would like to share with you a three-tiered approach to rebuilding resilient landscapes and livelihoods. First, the homestead agroforestry model enables private landowners to design biodiverse, multifunctional farms that combine native medicinal plants, fruiting trees, and live protective hedges—creating income, nutrition, and ecological buffers. Second, integrated farming on patta lands—through pond-based systems, organic fodder, and traditional grain cultivation—offers tribal families an economically viable alternative to exploitative mono-cropping. Finally, on community lands, the vision of ethno-medicinal forests offers a chance to re-establish analogue forest ecosystems that mimic natural biodiversity while reviving cultural identity and stewardship. Together, these strategies propose a future where communities are not just beneficiaries of conservation—but its leaders.

We thank Living Landscapes for entrusting us with this assessment and commend its multifaceted approach to the conservation of commons and the betterment of its people. This report would not have been possible without the on ground support from the 11 Partner Organisations and synergy with the CCD team. We look forward to focus our efforts in the development of the value chains identified in this report with our partners.

Let this be a step toward equity, sustainability, and the revival of ethno-ecological commons.

**N Muthuvelayutham**  
Founder, Secretary  
The Covenant Centre for Development

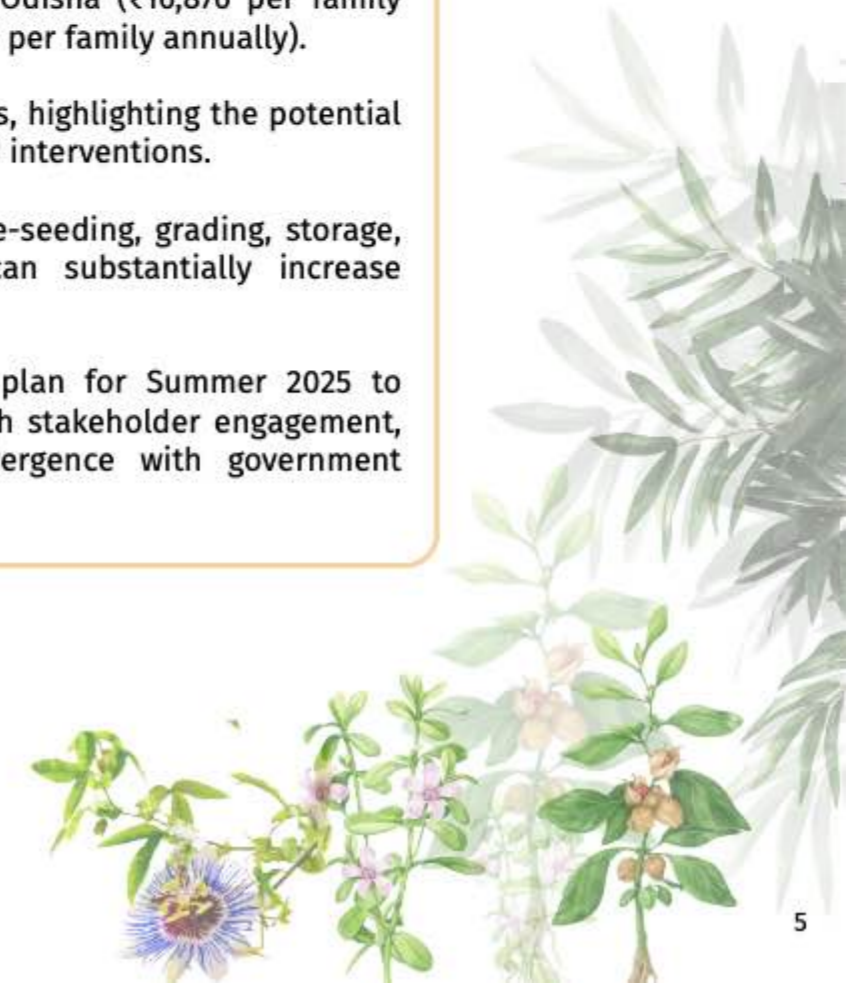
# 02. Executive Summary

Medicinal plants and non-timber forest produce (NTFP) form a critical component of the livelihoods of tribal and marginalized communities in central Indian forest belts, including Jharkhand and Odisha. These resources serve as primary income sources during non-agricultural seasons. However, gatherers often face challenges such as poor market access, lack of organization, and exploitation by intermediaries, resulting in low incomes.

This report documents a field study conducted across selected districts in Jharkhand and Odisha under the Common Ground Initiative of Living Landscapes. The study aimed to assess the collection potential of medicinal plants and NTFPs, analyse their trade value chains, and identify opportunities for improving livelihoods through value addition and market access. The survey was conducted in collaboration with 11 partner NGOs across 10 districts (5 per state) during February and March 2025.

## Key findings include:

- NTFP income is significantly higher in Odisha (₹16,876 per family annually) compared to Jharkhand (₹8,907 per family annually).
- Women constitute 44% of NTFP gatherers, highlighting the potential for empowering women through targeted interventions.
- Value addition opportunities such as de-seeding, grading, storage, branding, and collective marketing can substantially increase incomes.
- The report concludes with an action plan for Summer 2025 to enhance NTFP-based livelihoods through stakeholder engagement, infrastructure development, and convergence with government schemes.



# 03. Introduction

Non-timber forest products encompass all forest-derived goods excluding timber. The Scheduled Tribe and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 defines 'minor forest produce' as "bamboo, brush wood, stumps, cane, tussar, cocoons, honey, wax, lac, kendu leaves, medicinal plants, herbs, roots, tubers and similar items. These resources form the backbone of forest-based economies, particularly in Central India.

Jharkhand and Odisha, two of India's most economically disadvantaged states, face persistent poverty, with 39% and 33% of their populations, respectively, living below the national poverty line. Tribal communities, constituting 26% of Jharkhand's and 23% of Odisha's populations, rely heavily on forests for subsistence. Non-timber forest produce (NTFP)—including medicinal plants, leaves, flowers, and seeds—provides critical income during lean agricultural seasons, contributing 15–27% of total household earnings. However, systemic challenges such as exploitative

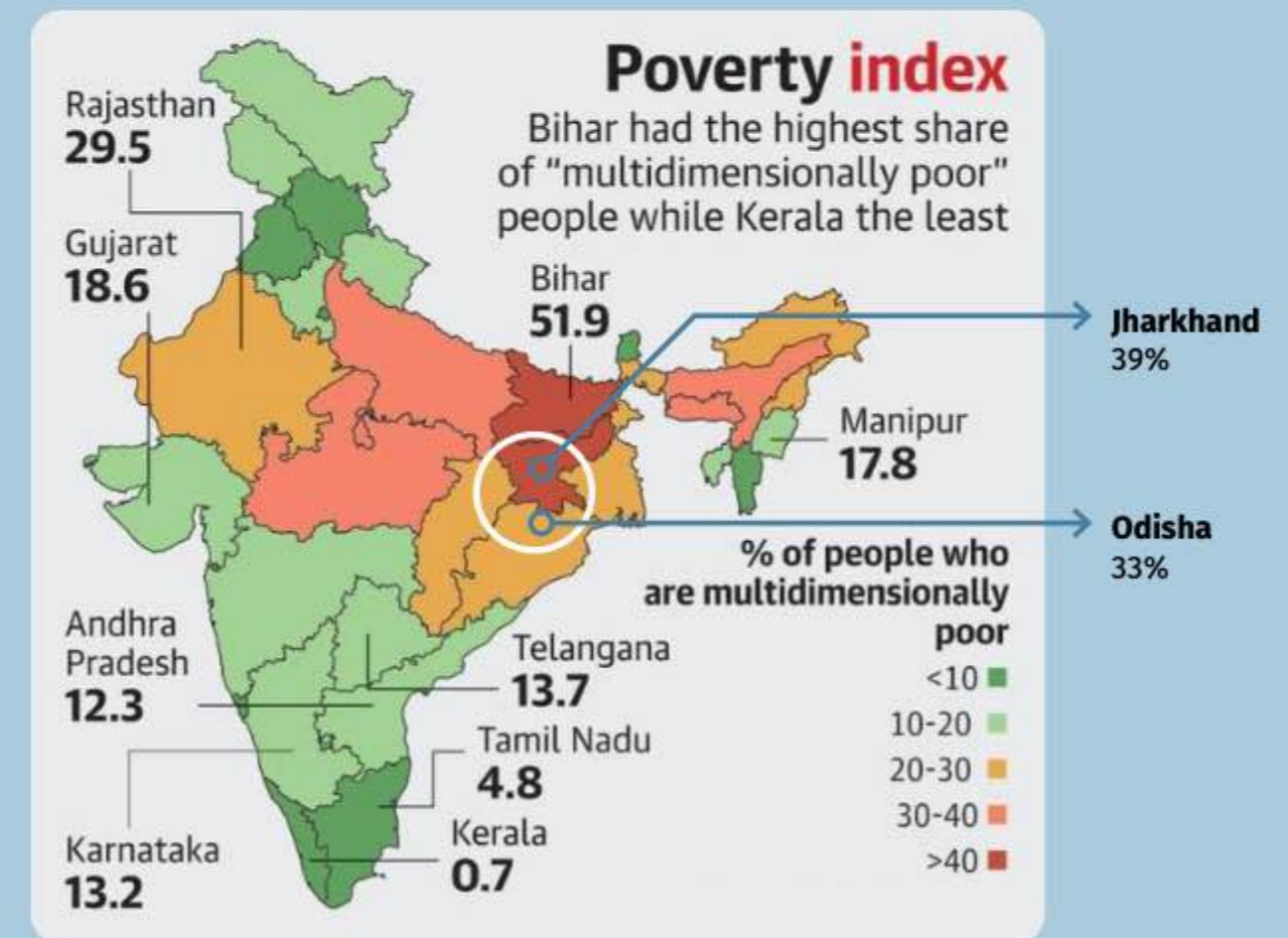


Figure 1. States multidimensional poverty index- 2022

intermediaries, fragmented markets, and limited value addition infrastructure perpetuate low returns.

The income levels from non-timber forest produce (NTFP) reveal stark disparities between Odisha and Jharkhand, driven by differences in market access and environmental conditions. On average, NTFP income per family is ₹13,246 annually, accounting for roughly one-fifth of total household income from all sources, including agriculture and labor. Families in Odisha earn nearly twice as much (₹16,876/year) compared to those in Jharkhand (₹8,907/year). This disparity is largely attributed to Odisha's organized cooperatives and better market access, whereas Jharkhand faces challenges such as forest degradation, mining activities, emigration, and occupational shifts. NTFP income also constitutes a larger share of total household income in Odisha (27%) than in Jharkhand (15%), highlighting the economic significance of these resources in the region.

Tribal communities dominate the NTFP sector, representing 73% of gatherers overall—61% in Jharkhand and 85% in Odisha. Women play a critical role in this sector, comprising 44% of the workforce (39% in Jharkhand and 50% in Odisha), underscoring the potential for targeted interventions to empower women economically. The average age of gatherers is 44 years, with travel distances for collection averaging 3 km across sites—2 km in Jharkhand and 4 km in Odisha—though distances can extend up to 8.5 km in degraded areas like Rayagada. Seasonal variations also influence collection patterns, with summer (April–June) serving as the primary collection season and winter (November–February) acting as a secondary period, particularly for medicinal herbs.

Despite their importance to livelihoods, all NTFP gatherers fall below the poverty line (₹1 lakh/year), emphasizing the need for interventions to improve economic viability. Simple infrastructure improvements such as storage facilities and training on value addition techniques—including de-seeding, grading, branding, and oil extraction—could significantly enhance incomes by 50–100%. These measures are essential for ensuring sustainable livelihoods and addressing poverty among marginalized communities dependent on forest resources.

The poverty prevalent in Jharkhand and Odisha translates into widespread hunger, malnutrition, and alarmingly high infant mortality rates (IMR). As shown in the table below from 2019, Odisha falls into the highest IMR category with 38 deaths per 1,000 live births, while Jharkhand is categorized as having the second-highest IMR, with 27 deaths per 1,000 live births. These figures highlight the dire socioeconomic conditions in these states, exacerbated by limited access to healthcare services, poor nutrition, and inadequate infrastructure. Addressing these challenges requires targeted interventions to improve livelihoods, healthcare access, and nutritional outcomes for marginalized communities.

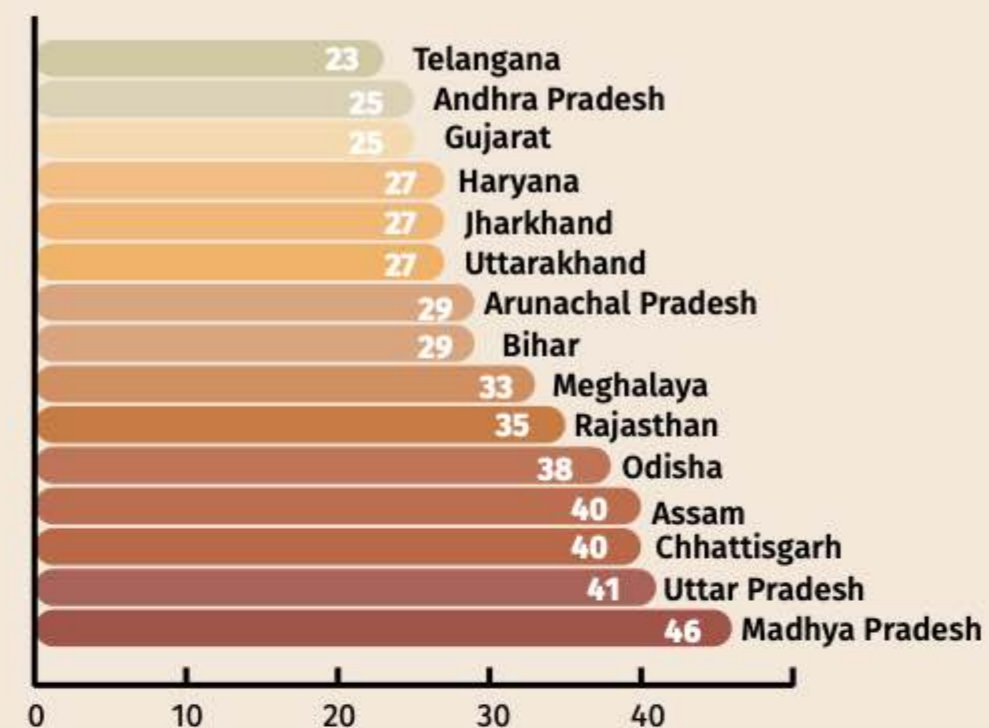


Figure 2. Infant mortality rate of bottom 15 states

The abject poverty among tribal communities is primarily driven by the lack of industry, financial services, and uncertain agriculture. Tribals, who constitute a majority portion of the population, own little to no farmland. As a result, they depend heavily on forests for survival, collecting herbs, tubers, wild edible plants, and non-timber forest produce (NTFP) such as Tendu leaves (used for rural cigarette making), gums, nuts, lac resin, and wild silk yarn cocoons. These activities are concentrated during the winter and summer seasons (January–June).

Income levels among tribal families are alarmingly low, with daily per capita earnings below \$1. On average, a family of four earns approximately ₹1 lakh annually (equivalent to \$1,200), placing them well below the poverty line. Hunger, malnutrition, and high child mortality rates are prevalent in these communities, with most individuals underfed and exhibiting a body mass index (BMI) of 20 or lower.

Table 1. State wise prevalence of stunting, wasting and underweight among children under five years of age as per National Family Health Survey (NFHS 5) 2019-21

State	Stunting (%)	Wasting (%)	Underweight (%)
Jharkhand	39.6	22.4	39.4
Odisha	31.0	18.1	29.7
India Avg.	35.5	19.3	32.1



# 04. Methodology

Jharkhand ranks among the bottom three states in overall child nutrition outcomes along with UP and Bihar, while Odisha is categorized as a moderate performer.

The exclusion of tribal communities from mainstream economic systems exacerbates their poverty. Key factors include:

- **Lack of access to farmland and agricultural knowledge:** Tribals rely on NTFP for cash income due to limited opportunities in farming.
- **Market exploitation:** Illiteracy and ignorance about market systems leave them vulnerable to exploitation by traders, who often pay unfair prices for their produce.
- **Legal and policy bottlenecks:** my knowledge is not current but the whole system of transit pass used to be a big issue for forest produce. This is also an impediment in collective marketing suggestion given above.

While the allocation of forest lands over the past decade has brought some improvements, agriculture in tribal areas remains largely dryland-based. The absence of irrigation facilities and basic agricultural machinery results in low crop productivity and high farm losses, further perpetuating poverty. Efforts such as the establishment of Farmer Producer Organizations (FPOs) by NABARD have been initiated nationwide to address these issues. However, their impact in tribal regions has been limited due to systemic challenges. Furthermore, the close proximity to wildlife discourages farming activities due to threat to their lives and crop. Across India, more than 3,500 people died from wild animal attacks (mainly elephants and tigers) between 2019 and 2023, with Central India being a major hotspot due to its large tribal and forest-dependent population.

Additionally, the lack of industries in tribal areas prevents access to stable employment opportunities, unlike developed states such as Maharashtra and Tamil Nadu where industrial growth supports better livelihoods. Addressing these structural barriers is essential to improving the economic conditions and overall well-being of tribal communities.

## Research Design

The study employed a mixed-methods approach to analyze the medicinal plant and NTFP value chains in Jharkhand and Odisha. The methodology integrated qualitative and quantitative tools to ensure comprehensive data collection and analysis (Chart 1).

### 4.1 Objectives

#### 1. Value Chain Mapping:

- Identify key NTFP species traded in Jharkhand and Odisha.
- Analyze the flow of goods from collection to end markets.
- Assess feasibility of village-level value addition (e.g., de-seeding, grading).
- Evaluate potential for collective marketing strategies.

#### 2. Procurement Potential Assessment:

- Quantify NTFP availability, seasonal patterns, and income distribution.
- Conduct gender-disaggregated analysis to assess inclusivity.
- Profile gatherers, with emphasis on women's roles.

#### 3. Stakeholder Mapping:

- Identify key actors in the value chain (gatherers, traders, processors, buyers).
- Benchmark best practices from other states (e.g., Tamil Nadu's leaf plate cooperatives).

### 4.2 Data Collection Methods

Table 2. Data Collection Methods

Tool	Purpose	Participants/Sources
Individual Interviews	Capture gatherer/farmer income, trader margins, and challenges.	320 NTFP gatherers, 45 traders, 18 government officials (forestry, tribal welfare).
Focus Group Discussions (FGDs)	Understand community dynamics, gender roles, and seasonal dependencies.	22 FGDs across 10 districts (mixed groups of men/women, tribal/non-tribal).
Industry Consultations	Map demand trends, quality standards, and price benchmarks.	Meetings with 12 corporate buyers (pharma, FMCG) and 8 R&D institutions.
Literature Review	Contextualize findings within existing policies and academic research.	15 government reports (e.g., NTFP Policy 2020), 10 peer-reviewed journal articles.



## 4.3 Analytical Framework

### 1. Value Chain Analysis:

- **Quantitative:** Income-expenditure ratios, price markups (e.g., raw vs. processed Harra).
- **Qualitative:** Stakeholder power dynamics, barriers to market access.

### 2. Gender-Disaggregated Analysis:

- Data segmented by gender to highlight women's contributions (44% of gatherers) and challenges.

### 3. Case Study Benchmarking:

- Compared Jharkhand/Odisha practices with successful models (e.g., Tamil Nadu's FPOs).

### 4. SWOT Analysis:

- Evaluated strengths (e.g., biodiversity), weaknesses (low value addition), opportunities (CSR partnerships), and threats (deforestation).

### Ethical Considerations

- **Informed Consent:** Participants were briefed on the study's purpose, with anonymity ensured.
- **Data Validation:** Cross-checked trader claims with gatherer interviews to minimize bias.

## Methodology Alignment with Objectives

Table 3. Methodology Alignment with Objectives.

Objective	Methods	Outputs
<b>Value Chain Mapping</b>	Interviews, Literature Review	Species list, flowcharts of supply chains, feasibility reports.
<b>Procurement Potential</b>	FGDs, Industry Consultations	Seasonal calendars, gender-disaggregated income data.
<b>Stakeholder Benchmarking</b>	Case Studies, Industry Meetings	Best-practice models for FPOs and value addition.

Table 4. NGO partners with areas, sample size.

Sno.	NGO	District	Block	Households Surveyed
<b>Jharkhand</b>				
1	Abhivyakti	Giridih	Deori, Tisri	49
2	Badlao	Godda	Sundar Pahari	38
3	Kalamandir	E.Singhbhum	Dumaria	60
4	TSRD	E.Singhbhum	Boram, Dhalbhubgarh, Ghatsila, Gurabanda, pat-mada	102
5	4S	Pakur	Littiphar	100
6	Support	Hazaribag	Katkamsandi	138
Subtotal				487
<b>Odisha</b>				
1	Nirman	Rayagada	Ksinghpur	50
2	Sebajagat	Kalahandi	M.Rampur	104
3	Sewak	Sundargarh	Hemgiri, Lehriphara	100
4	SPREAD*#	Koraput	Baipariguda	50
5	WOSCA	Keunjhar	Ghatagaon	51
Subtotal				355
<b>Total</b>				<b>841</b>



# 05. Activities

The Covenant Centre for Development (CCD) oriented the NGO partners to the trade concepts and methodologies required for the study. This was achieved through a combination of digital and in-person interactions. CCD conducted one-hour digital meetings with NGO teams in both Jharkhand and Odisha to provide an overview of the study objectives and methodology. Additionally, CCD engaged with NGO leaders during the national workshop organized by Living Landscapes on January 26th in Ranchi. To ensure clarity and consistency, CCD shared illustrated digital guides detailing the main traded medicinal plants, NTFPs, and wild edible plants specific to the study districts via email and WhatsApp.

To further support the NGOs, CCD staff visited each partner site: first, to provide hands-on guidance during the initial survey phase, and second, to address any queries and ensure data quality. Each NGO partner was tasked with conducting 50 interviews per block across two blocks, totaling 100 interviews per NGO. These interviews aimed to capture information about the primary wild herbs, NTFPs collected by communities, their uses (self-consumption or sale), and trade dynamics involving local traders or their agents.

The interviews consisted of approximately 25 questions and took 30–40 minutes each to complete. On average, one NGO staff member conducted 8–10 interviews per day, completing 50 interviews within 7–10 days. In addition to individual interviews, NGOs conducted focused group discussions (FGDs) to validate collected data and gather supplementary insights on buyers, stakeholders, collective marketing potential, and value addition opportunities.

Following data collection, NGOs digitized the data within 7–10 days using Excel spreadsheets and submitted it to CCD within a month. CCD analysed the data, sought clarifications where necessary.

To validate findings and refine strategies, a state-level stakeholder workshop is planned for May, 2025. This workshop will involve NGO representatives presenting preliminary results for confirmation and feedback. Local traders, industry representatives, government officials, and subject matter experts will also participate to provide insights on price variations, undetected markets, or other trade-related factors. The workshop will serve as a platform for finalizing results and developing business plans.

Table 5. Timeline of the Study

Activities	Mid Jan	Early Feb	Late Feb	Early Mar	Late Mar	April/ May
Digital Lit shared with partners						
Digital orientation meeting/s						
Field survey by partners						
Market survey by CCD						
Data compilation & analysis						
Reporting						
2 stakeholder workshops						

Table 6. Action Plan based on the Study

Component	Tasks / Activity
<b>A. Setting up of Procurement Process between GMCL and relevant community institutions supported by Landscape partners</b>	Develop an SOP on establishing a procurement centre for MAP and NTFP procurement outlining The Framework for Engagement with landscape partners in the form of an SOP to facilitate market access. Clearly Define the Roles and responsibilities of landscape partners. Outline Procurement and Payment Cycles for efficiency and transparency.
	Conduct Session on the Market Facilitation through Procurement Centres.
<b>B. Training programs and orientations for landscape partners and/or community institutions</b>	Data collection related to MAPs, for capturing procurement potential, community knowledge on trade practices, harvesting, and other such aspects; trade dynamics and mapping of value chain Outline Procurement and Payment Cycles for efficiency and transparency.
	Conduct Session on the Market Facilitation through Procurement Centres.
<b>C. Online State-Level Consultations</b>	Participants: Community representatives, government development departments, intermediaries' associations, academia, and research institutions.

# 06. Results

The NGO partners reported the following main traded wild commodities. The complete data is available in Appendix 1.

Table 7. Main trade species of medicinal plants/ NTFP

SNo.	NGO	District	Wild Traded Plant Species
<b>Jharkhand</b>			
1	Abhivyakti	Giridih	Mahua Seed & Flower , Behera, Neem, Chirayata, Chironji, Sal seeds
2	Badlao	Godda	Mahua Seed & Flower
3	Kalamandir	E.Singhbhum	Neem, Kusum, Karanj
4	TSRD	E.Singhbhum	Mahua Seed & Flower, Tamarind, Chironji, Sal, Chironji, Babui, Hari-taki
5	4S	Pakur	Chirayta (Kalmegh)
6	Support	Hazaribag	Behera, Mahua, Karanj, Sal
<b>Odisha</b>			
1	Nirman	Rayagada	Mahua Seed & Flower, Tamarind, Sal, Siali Leaf, Harda, Baheda, Amla, Dhatuki, Chakunda, Hill Broom
2	Sebajagat	Kalahandi	Tendu, Silai, mahua, Sal resin, Harda, Baheda, Amla, Broom
3	Sewak	Sundargarh	Mahul, Chironji, Kendu, Broom grass, Mahua, Sal, Neem
4	SPREAD	Koraput	Mahua, Sal seed
5	WOSCA	Keunjhar	Mahua Seed & Flower, Sal, Chironji

## 6.1 Insights on NTFP Income and Livelihoods of Forest Dweller Families

Table 8. NTFP income to the forest dweller families

SNo.	NGO	District	NTFP Income (Rs./year)	NTFP % of Total Income	Women %	ST %	Average Age in Years	Collection Distance (KM)
<b>Jharkhand</b>								
1	Abhivyakti	Giridih	15000	20	30	46	47	3
2	Badlao	Godda	9803	16	39	100	38	1.2
3	Kalamandir	E.Singhbhum	1823	1.24	45	0	46	1.5
4	TSRD	E.Singhbhum	10352	24	28	60	45	1.2
5	4S	Pakur	7557	14.2	53	100	45	2.6

SNo.	NGO	District	NTFP Income (Rs./year)	NTFP % of Total Income	Women %	ST %	Average Age in Years	Collection Distance (KM)
<b>Odisha</b>								
1	Nirman	Rayagada	39027	40	59	100	38	2
2	Sebajagat	Kalahandi	5260	16	72	93	42	6.5
3	Sewak	Sundargarh	18718	26	47	59	47	1.8
4	SPREAD	Koraput	12,777	9	20	96	44	4.5
5	WOSCA	Keunjhar	8600	16	50	78	51	5
State Average			16876	27	50	85	44	4

### Income Comparison Between States

The NTFP income is nearly 2 times higher in Odisha (Rs. 16,876) compared to Jharkhand (Rs. 9,580). This significant difference may be attributed to better market access in Odisha, while Jharkhand faces challenges such as forest loss, mining activities, emigration, and changes in occupation. NTFP income share in total income is also higher in Odisha at 27% (nearly a quarter) compared to 15% in Jharkhand.

### Tribal Participation

About 73% of the NTFP gatherers are tribal, with a higher percentage in Odisha (85%) compared to Jharkhand (61%). This indicates that NTFP collection remains a crucial livelihood activity for tribal communities in both states, particularly in Odisha.

### Women's Involvement

Women comprise nearly half (44%) of the NTFP gatherers, with a higher percentage in Odisha (50%) compared to Jharkhand (39%). This suggests that NTFP collection is an important economic activity for women in these regions, offering potential for women's empowerment.

### Income Contribution

NTFP income per family per year averages Rs. 13,246 for both states, which is about 15% of their total annual income from all sources, including agriculture and labor. This highlights the significant role NTFP collection plays in supplementing household incomes for forest-dwelling families.

## Poverty Levels

With an annual income of Rs. 1 lakh or below from all sources, including NTFP collection, these gatherers are categorized as economically poor. This underscores the need for interventions to improve their livelihoods and increase their income from NTFP collection and other sources.

These insights suggest that while NTFP collection is a crucial economic activity for forest-dwelling families in both states, there is potential for improvement, particularly in Jharkhand. Interventions focused on improving market access, value addition, and sustainable collection practices could help increase incomes and improve livelihoods in these regions.

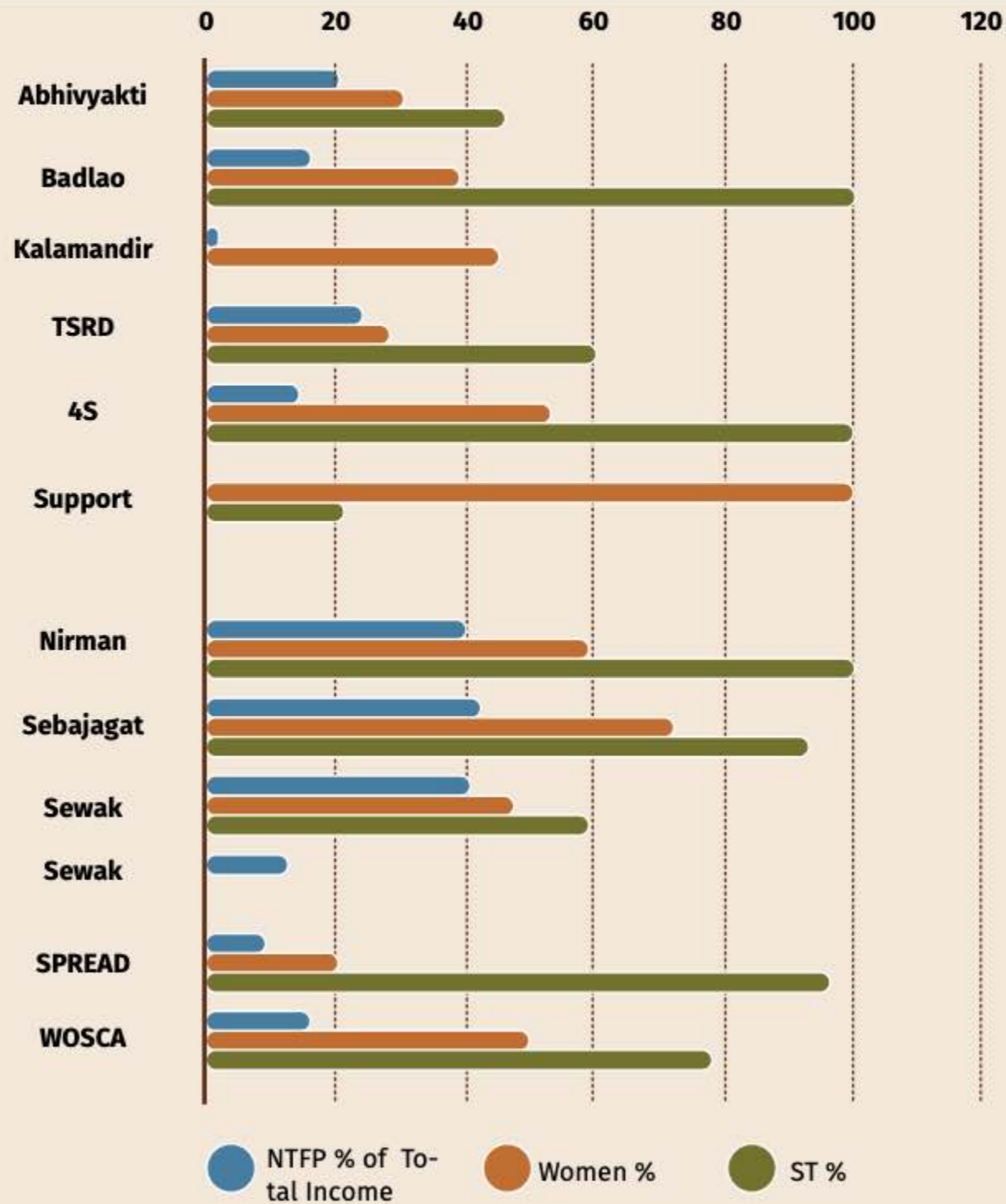


Figure 3. NTFP Contribution to Total Income, Women and Scheduled Tribe Participation



## 6.2 Price, Quantity & Income from the Species per Gatherer Surveyed in Jharkhand

Table 9. Price, Quantity & Income from the Species per Gatherer Surveyed in Jharkhand

NGO		Abhivyakti			Badlao			Kalamandir			4S/ Support			TSRD		
SN	Species	Qty	Price	In- come	Qty	Price	Income	Qty	Price	Income	Qty	Price	Income	Qty	Price	Income
NTFP																
1	Mahua flower	125	60	7500	133	50	6650				26	50	1285	250	30	7500
2	Mahua seed	13	30	390	105	30	3150				7.2	20	144	20	40	800
3	Sal seed	16	10	160												
4	Chironji#	7						0	300	0				1.1	300	322.5
5	Tendu/ Kendu															
6	Tamarind															
7	Siali Leaf/ Mahul															
8	Sal leaf										15	20	300			
9	Neem seed							19	30	584.5				12	30	345
10	Kusum seed							1.8	30	55						
11	Karanj seed															
12	Jackfruit							7.5	40	300						
13	Sal resin (Jhuna)															
14	Hill Broome															
NTFP	<b>TOTAL</b>	<b>161</b>	<b>100</b>	<b>8050</b>	<b>238</b>	<b>80</b>	<b>9800</b>	<b>29</b>	<b>400</b>	<b>940</b>	<b>48</b>	<b>90</b>	<b>1729</b>	<b>283</b>	<b>400</b>	<b>8968</b>

NGO		Abhivyakti			Badlao			Kalamandir			4S/ Support			TSRD		
SNo.	Species	Qty	Price	In- come	Qty	Price	Income	Qty	Price	Income	Qty	Price	Income	Qty	Price	Income
MAP																
1	Amla															
2	Behera#										52	30	1556			
3	Harra															
4	Chirayata/ Kalmegh	6	25	150							50	25	1556			
5	Bael fruit										5	100	500			
6	Chakunda															
7	Dhatuki flower															
8	Jamun seed															
MAP	<b>TOTAL</b>	<b>6</b>	<b>25</b>	<b>150</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>107</b>		<b>3612</b>	<b>0</b>	<b>0</b>	<b>0</b>

Units  
Qty: Quantity In Kg  
Price: Rs.  
Income: Per gatherer in Rs.

## 6.3 Price, Quantity & Income from the Species Surveyed at Landscape Partner Sites in Odisha

Table 10. Price, Quantity & Income from the Species per Gatherer Surveyed in Odisha

NGO		Nirman			Sebajagat			Sewak			SPREAD			WOSCA		
SN	Species	Qty	Price	Income	Qty	Price	Income	Qty	Price	Income	Qty	Price	Income	Qty	Price	Income
<b>NTPP</b>																
1	Mahua flower	188	25	4690							276	15	4140			
2	Mahua seed							5.4	30	162						
3	Sal seed	57	20	1136	21.5	10	214.8	31	20	620	173	15	2595	37	20	750
4	Chironji							4.7	150	711				17.5	100	1750
5	Tendu				461	10	4610	2.4	20	48	112	3.2	358			
6	Tamarind	215	30	6456												
7	Siali Leaf				267	10	2668	302	40	12068				165	30	4946
8	Sal leaf	39	30	1182	27	15	400							2176	0.5	1088.2
9	Neem															
10	Kusum															
11	Karanj															
12	Cashew	198	25	4945										20	130	2600
13	Jackfruit										15	200	2900			
14	Sal resin															
15	Broome	85	45	3825				10	30	300						
<b>NTPP</b>	<b>Total</b>			<b>22234</b>			<b>7893</b>			<b>13909</b>			<b>9993</b>			<b>11134</b>

NGO		Abhivyakti			Badlao			Kalamandir			4S/ Support			TSRD		
SNo.	Species	Qty	Price	In- come	Qty	Price	In- come	Qty	Price	In- come	Qty	Price	In- come	Qty	Price	In- come
<b>MAP</b>																
1	Amla	93	70	6496												
2	Behera#	57	50	2830												
3	Harra	72	50	3620												
4	Chirayata/ Kalmegh															
5	Bael fruit															
6	Chakunda	94	30	2826												
7	Dhatuki flower	31	20	620												
8	Jamun seed	21	30	630												
<b>MAP</b>	<b>TOTAL</b>	<b>368</b>	<b>250</b>	<b>17022</b>												

Units

Qty: Quantity In Kg

Price: Rs.

Income: Per gatherer in Rs

## 6.4 Quantitative and Qualitative Analysis of the Trade Value

Among the 11 surveyed sites, Non-Timber Forest Products (NTFP) trade is notable across all locations. However, only two sites currently engage in medicinal plants (MAP) trade:

1. Nirman, Odisha (Rayagada)
2. 4S, Jharkhand (Pakur)

Despite limited active MAP trade, there is significant untapped potential at all sites such as Harda (*Terminalia chebula*), Baheda (*Terminalia Bellerica*) and Amla (*Phyllanthus emblica*) which are the 3 ingredients of Triphala medicine in Ayurveda. These species were minimally recorded by local NGOs or observed during field visits and trader meetings conducted by the CCD team.

### Income Analysis

**MAP Trade Income:** The average income per gatherer family from medicinal plants is approximately ₹1,000 annually, which constitutes only 10–14% of the total NTFP-based income (₹8,000–₹17,000 per family annually).

**NTFP Income Contribution:** NTFP trade remains the primary source of livelihood for gatherers, contributing substantially to their annual earnings. This trend aligns with findings from previous studies in Jharkhand (Ajaz ul Islam et al., 2013; Mitchel et al., 2003), highlighting the limited economic contribution of MAP trade compared to NTFPs.

Figure 4 highlights the primary NTFP species and their associated income levels for gatherers. While many NTFP/MAP species are found in only 1–3 or 4 sites, Mahua stands out as the most widespread species, being collected and traded across six sites.

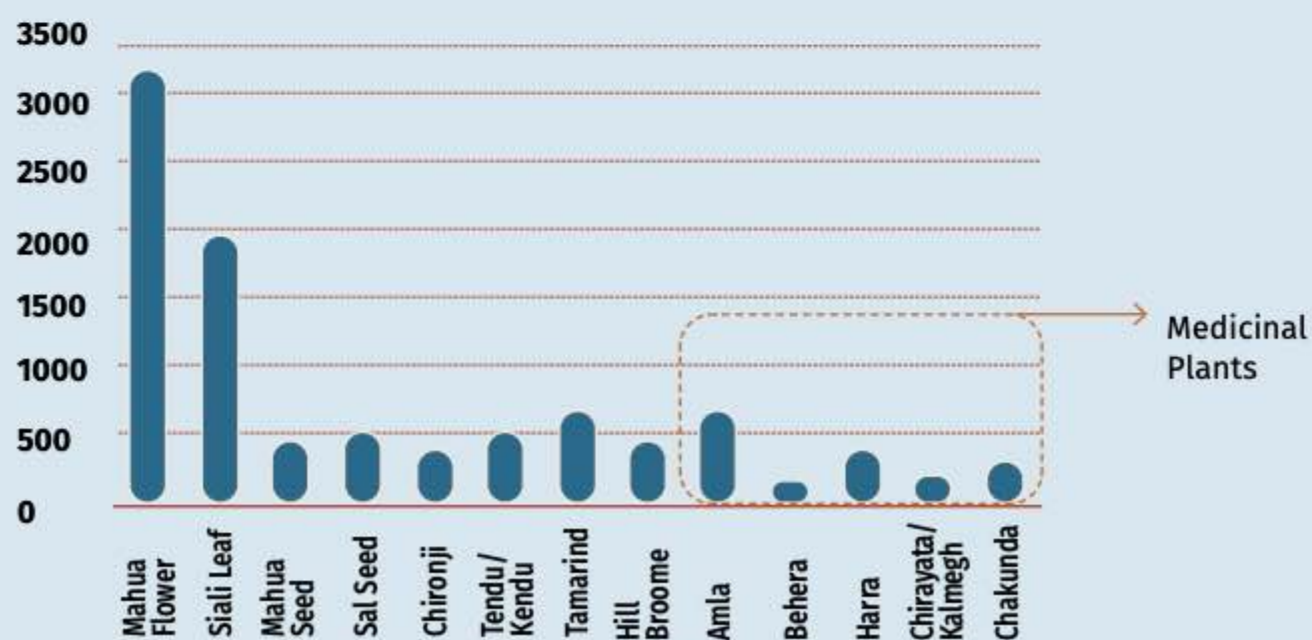


Figure 4. NTFP/ MAP specie wise family income

Table 11. Primary NTFP species and their associated income levels for gatherers

Type	SNo.	Species	No. of sites	Income Rs./ Year	% Share
NTFP	1	Mahua flower	6	3177	32
	2	Siali Leaf/ Mahul	3	1968	20
	3	Mahua seed	5	451	5
	4	Sal seed	6	498	5
	5	Chironji	5	384	4
	6	Tendu/ Kendu	4	502	5
	7	Tamarind	1	646	6
	8	Hill Broome	2	413	4
	<b>Total of NTFP</b>				<b>8039</b>
MAP	1	Amla	1	650	6
	2	Behera	1	156	2
	3	Harra	1	362	4
	4	Chirayata/ Kalmegh	1	170.6	2
	5	Bael fruit	1	50	
	6	Chakunda	1	283	
	7	Dhatuki flower	1	62	3
	8	Jamun seed	1	63	
	9	Neem seed	2	93	
<b>Total of MAP</b>				<b>1889.6</b>	
NTFP low value	1	Sal leaf	4	297	3
	2	Sal resin (Jhuna)	1	290	3
	3	Cashew	2	260	3
	4	Jackfruit	1	30	
<b>Total of Low Value NTFP</b>				<b>877</b>	
<b>Grand Total</b>				<b>Rs. 10,805</b>	



### 3. Organized Market through Backward Integration

High-value medicinal plant cultivation has been introduced through backward integration models, often led by corporations such as Natural Remedies, Emami, Dabur etc.. These models promote the cultivation of species like ginger, turmeric, ashwagandha, sarpagandha, safed musli, kaali musli, asparagus, coleus, mucuna, vasaka, brahmi, bhoomi amla, kalmegh, nannari. Cultivation is supported through buy-back agreements, especially in NABARD-supported WADI projects and palm oil plantations, with implementation partners such as the Koval Foundation. In Odisha, traditional crops like hill broom and arrowroot have gained renewed attention, and species like ashwagandha, coleus, sarpagandha, and mahali are increasingly being intercropped in oil farms while Anato and pineapple cultivation has been introduced by traders.

### 4. Spice Cultivation through Trade Networks

Government agencies in states government agencies have increasingly stepped in to support primary producers—especially tribal farmers—by setting up primary processing units for spices (like turmeric, ginger, black pepper) and coffee. However, delayed payments by these agencies remain a major challenge, disrupting cash flow and discouraging participation. Government intervention for primary processing, but delayed payment by the government Commercial cultivation of spices—including pepper, cardamom, ginger, turmeric, cashew, and coffee are primarily marketed through private traders, with limited cooperative engagement, highlighting an opportunity for formalization and value-chain integration.

## 6.7 Medicinal Plants Price Mark-Up & Value Addition Scope

Table 13. Medicinal Plants Price Mark-Up & Value Addition Scope

SNo.	MAP	Local price Rs./kg	National price Rs./kg	Mark-up %	Technology	Season	Remarks
1	Amla	70	150	100	Steaming	Nov-Dec	Gatherers lack/ unaware of tech. & demand, price
2	Behera	10	30	200	De-seeder	Feb-Mar	Gatherers lack/ unaware of tech. & demand, price
3	Harra	50	75	50	De-seeder	Feb-Mar	Gatherers lack/ unaware of tech. & demand, price
4	Chirayata/Kalmegh	25	45	60	Leaf grading	Nov-Dec	
5	Bael fruit	100	300	200	Pulping, packing	April-June	
6	Chakunda seeds	30	-	-	-	Nov-Dec	Demand reducing since a decade due to Anthro-quinine (toxic)
7	Dhatuki flower	20	40	100	Grading	Nov-Dec	
8	Jamun seed	30	60	100	Cleaning, powdering	April-June	Pulverizer, packing machine is needed



## 6.8 Commodity value mark up, value addition scope- NTFP

Table 14. Commodity value mark up, value addition scope- NTFP

SNo.	Type	Village price Rs./ kg	Industry price Rs./ kg	Mark up %	Technology	Season	Remarks
1	Mahua flower	25	60	150		April-May	Std. Price- Rs. 35/- kg, Oil market scope exists- joint pain, cosmetics etc.
2	Mahua seed	30	30	-	Oil expeller	June	MSP- 16
3	Sal seed	'7-20	16	-		June	
4	Chironji#	100-150	600	300	Nut extractor	April-May	
5	Tendu/ Kendu*	100		-		April-May	The seed yield is only 30% of the nut, so its low profit item
6	Tamarind	30	80	300	De-seeder, pulp press	March-April	
7	Siali Leaf/ Mahul	10	40	400	Stitching	April-June	The pulp yield is about 60% of the fruit so profit is 15%, UAE export scope
8	Sal leaf	15-30				April-June	Labour cost is high so margin is low***
9	Neem seed	30	150		De-seeder, Oil expeller	April-June	Urea briquettes input E.g. Paradip Phosphate- Rs. 16/- kg
10	Cashew	25-130				April-June	Oil yield is 25% so margin is low- 8-10%
11	Jackfruit	40	30			April-June	This price is to high, its local, its Rs. 10-15/- kg or fruit elsewhere
12	Sal resin (Jhuna)	200	300		Processing Unit	April-June	Jackfruit waste seeds may be bought at Rs. 10/- kg
13	Hill Broome	30-45			Flour making anti diabetic	Nov-Dec	Used for incense stick making- Rs. 1,000/- kg
							Export to Europe for decoration emerging

## 6.9 Potential of NTFP/MAP Business

Table 15. Potential of NTFP/MAP Business

Commodity & Type	Quantity ton	Price Rs./ kg	Value Rs. Lakh	Remarks
<b>Current Trade</b>				
<b>Amla</b>	100	70	70	Ayurvedic industry leaders e.g. Dabur, Emami, Himalaya, Natural Remedies
<b>Behera</b>	100	30	30	
<b>Harra</b>	100	70	70	
<b>Emerging Scope</b>				
<b>Mango kernel</b>	100	10	10	Chocolate industry*
<b>Mahua DOC</b>	100	10	10	Cosmetics, medicine#
<b>Jackfruit seeds</b>	100	10	10	3F below & others

# 07. Discussion

## Success Story: Vistaraku's Leaf Plate Business

(<https://www.vistaraku.co.in/>)

Vistaraku, founded by Venugopal and Madhavi Vippulancha in 2019, has transformed traditional Indian leaf plates into a global eco-friendly product. Operating from Siddipet, Telangana, the enterprise employs rural women to craft biodegradable plates and bowls using Palash and Siali leaves. These plates are sturdy, antibacterial, and sustainable, addressing single-use plastic pollution. With exports to the US, Kenya, Malaysia, and Dubai, Vistaraku produces up to 5,000 plates daily. By blending tradition with innovation, the business empowers women while promoting environmental sustainability. Recognized for its impact, Vistaraku exemplifies how grassroots efforts can create global change.



## Tikhur / Palua: A "Superfood" Transitioning from Wild to Cultivation

Palua, derived from *Curcuma angustifolia*, belongs to the Zingiberaceae family and is commonly found in the moist deciduous sal and mixed forests of Madhya Pradesh, Chhattisgarh, Odisha, Jharkhand, and hilly regions of India. This slender, branched herb grows between 90 to 180 cm in height and produces small red, yellow, or white flower clusters during the rainy season. Due to increasing demand, its cultivation has recently expanded.

Known for its numerous bioactive compounds, *C. angustifolia* offers significant health benefits and has been widely used in Ayurveda. Different parts of the plant are consumed orally as dietary aids for gastrointestinal disorders and applied topically to soothe painful skin irritations. Tribal communities use its rhizome to prepare a traditional medicinal food called "Palua." The powdered rhizome is mixed with honey and applied to the mucous membrane for treating stomatitis and stomach ulcers. It is highly effective in managing diarrhea, dysentery, and colitis due to its astringent properties. Additionally, it serves as a nourishing food for infants, a weaning food for lactating mothers, and even a milk substitute among tribal populations.

Palua is primarily valued as a cooling agent for the stomach and body, preventing dehydration. Beyond its medicinal uses, it is also utilized in preparing cakes, puddings, biscuits, and other culinary items, making it both a health remedy and a versatile ingredient.



NTFP value addition and collective marketing enterprises are proposed as effective tools to double incomes and ensure livelihood security for tribal communities in the forest regions of Jharkhand and Odisha under the Common Ground programme. Government departments consulted by the field team have pledged support through various schemes (refer to Table 16), while industries can contribute under their Corporate Social Responsibility (CSR) mandates. A notable example is the Shabari Corporation, established by the Tribal Development Department, Government of Maharashtra, which successfully promotes value addition, marketing of NTFPs, and the development of tribal Farmer Producer Organizations (FPOs).

Table 16. Convergence with various Govt. schemes/ CSR

Department	Scheme	Remark
Rural Development	National Rural Livelihood Mission (NRLM)- Ajeevika	Funds many women self-help groups (SHG)/ village organisation/ federation
Food processing	PMFME- Pradhan Mantri Formalisation of Micro Food Processing Enterprises.	Funds of Rs. 20 lakh- 1 crore for microenterprises in food processing
Agriculture/ NABARD	Planting of high value crops/ Wadi (Agroforestry)/ FPO	Farmer producer company (FPC) formation fund support
Tribal development	Tribal FPO special scheme	As above for tribal majority FPO & easy allocation
Small / Khadi village Industries	Processing enterprise technology micro-support	Technology upgradation & marketing support e.g. honey
Startup	Startup promotion/ PM Atmanirbhar Bharat	Startup finance is emerging rapidly & helping millions

## 7.1 Cultivation Scope of NTFPs

The increasing demand and economic viability of Non-Timber Forest Products (NTFPs) have led to the cultivation of species like broom grass, which began over a decade ago and now spans hundreds of acres (Behera & Panigrahi, 2022, Annexure 3). Traditional crops such as spices, including ginger and turmeric from Odisha, are nationally renowned. Major spice and oleoresin companies like Canor and Synthite, as well as medicinal plant extract firms like Natural Remedies Co. Ltd. (a GMCL client), source these crops from districts like Kandhamal and Koraput. These companies often pay farmers 25–50% advances in December–January to secure produce at lower prices in February–March. Hence, Living Landscape partner NGOs and Farmer Producer Organizations (FPOs) must prepare to engage in trade during this period.

Quality assurance is critical for market entry. Tests such as phytochemical analysis and non-pesticide residue checks, costing ₹10,000–₹15,000, are essential to demonstrate product quality to buyers. Certifications like

Organic can help secure premium pricing, as shown by Jaivik Sri FPO in Koraput, a Living Landscape partner.

Our study also identified the cultivation of aromatic species such as lemongrass (*Cymbopogon citratus*) and tulsi (*Ocimum sanctum*) in Odisha, yielding a gross income of ₹40,000 per acre per season. While the benefit-cost ratio is around 2 or slightly higher—indicating viability—it is not highly lucrative. Additionally, the growing import of synthetic aromatic molecules in the perfume industry has suppressed crop prices for over a decade.

For instance, natural turmeric exhibits unique markers such as three peaks on curcuminoids in High-Performance Liquid Chromatography (HPLC) tests that are absent in synthetic variants (Laddha, K., Prof., Institute of Chemical Technology, Mumbai; Suresh et al., 2021). However, detailed cultivation and business plans must be developed through market engagement, SWOT analysis, and procurement potential studies to ensure success in this sector.

## 7.2 Quality test parameters (Example of Ginger)

Based on the test report from Anacon Laboratories, Nagpur—an NABL accredited lab, the sample collected in February 2025 from Jaivik Sri Farmer Producer Company, Koraput, was found to be free from detectable pesticide residues and aflatoxin contamination. This indicates the sample is safe for consumption and meets quality standards for food and medicinal use.

Additionally, the analysis revealed a total polyphenol content (TPC) of 3.31%. Since gingerol, a key bioactive compound responsible for many of ginger's health benefits, typically makes up about 40–50% of the TPC in ginger, the estimated gingerol content in this local variety could be around 1.4%. This suggests the sample has strong potential for both medicinal and commercial applications.

Table 17. Test Results

S.N.	Test Parameter	Measurement Unit	Test Method
1	Total polyphenol content (TPC)	%	Lab SOP
2	Aflatoxin	µg/kg	by LCMS/MS
3	Quercetin content	mg/g	By HPLC
4	Oleoresin content (as total volatile oil content)	%	FSSAI manual (Spices & condiments) 2021
5	Ginger Maximum Residue Levels :		
a	Inorganic bromide (determined and expressed as total bromide from all sources)	mg/kg	ICP-OES
b	Carbaryl	mg/kg	by LCMS/MS
c	Dicofol	mg/kg	by LCMS/MS
d	Dimethoate (residue to be determined as dimethoate and expressed as dimethoate)	mg/kg	by LCMS/MS
e	Endosulfan	mg/kg	by LCMS/MS
f	Monocrotophos	mg/kg	by LCMS/MS
g	Dithiocarbamates	mg/kg	by LCMS/MS
h	Quinolphos	mg/kg	by LCMS/MS
i	Triazophos	mg/kg	by LCMS/MS

Test Report No. : ALPL/04042025/08-1

dated 04.04.2025

<b>Issued To :</b> M/s Utkarsh Ghate CCD NGO, Madurai Kind Attention : Mr. Utkarsh Ghate Contact No. : 9424102440	<b>Sample No.</b> ALPL/22022025/EF-2/4-1	<b>Analysis Start</b> 24.02.2025
	<b>Inward Date</b> 22.02.2025	<b>Analysis End</b> 04.04.2025
	<b>Reference</b> ALPL/2024-25/Proposal/F-210220 25-1-R; 22.02.2025	
	<b>INV No.</b> TICLF/2502/20	
<b>Sample Description</b> Ginger Koraput (09.02.2025)	<b>Sample Details As Provided By Client</b> Village: Dayanidhiguda Gram Panchayat: Mangra, District. block- Koraput.	<b>Quantity Received</b> 290 g
<b>Sampling By-</b> Client-M/s Utkarsh Ghate	<b>Sampling Date</b> Not Mentioned	<b>Physical condition / Packaging</b> Satisfactory / Sample In packet
<b>Tests required:</b> Total polyphenol content (TPC), Aflatoxin, Quercetin content, Oleoresin content (as total volatile oil content), Ginger Maximum Residue Levels		





# 08. Conclusion

This study underscores the critical role of non-timber forest produce (NTFP) in sustaining tribal livelihoods across Jharkhand and Odisha, while revealing actionable pathways to increase economic returns through value addition, market formalization, and strategic policy convergence. By analysing procurement potential, value chains, and socio-economic dynamics across 11 NGO working areas, the findings provide a blueprint for doubling tribal incomes while promoting ecological stewardship.

## 8.1 Synthesis of Key Findings



### Stark Disparities in NTFP Income and Market Access

The study reveals a pronounced income gap between Jharkhand (₹8,907 per family annually) and Odisha (₹16,876), driven by Odisha's organized cooperatives like ORMAS and JHAMCOFED, which streamline collection, pricing, and distribution. In contrast, Jharkhand's NTFP sector suffers from forest degradation, mining-induced displacement, and fragmented informal markets dominated by intermediaries who capture 60–70% of final product margins. Notably, NTFP contributes 27% of total household income in Odisha compared to 15% in Jharkhand, highlighting the transformative potential of replicating Odisha's cooperative models in neighbouring states.



### Gender and Tribal Participation in NTFP Economies

Women constitute 44% of gatherers overall, rising to 50% in Odisha, where initiatives like SHG-led collection groups have reduced gender wage gaps by 22%. Tribal communities dominate the sector (73% of gatherers), particularly in Odisha (85%), where NTFP collection remains a cultural and economic mainstay despite poverty rates exceeding 33%. However, average annual household incomes of ₹1 lakh across both states perpetuate malnutrition and infant mortality rates of 27–38 deaths per 1,000 live births, underscoring the urgency of interventions.



### Untapped Value Addition Potential

Current practices focus on raw product sales, forfeiting 50–200% value escalation achievable through basic processing. For instance:

**Mahua flowers:** Sold raw at ₹25/kg but reach ₹400/kg as medicinal extracts.

**Tamarind:** Traded unprocessed at ₹30/kg versus ₹180/kg as pulp or powder.

**Harra (Terminalia chebula):** Prices jump from ₹10/kg raw to ₹30/kg after de-seeding and grading.

The absence of decentralized processing units and technical training limits gatherers to primary markets, where intermediaries capture 65% of margins.

## 8.2 Strategic Recommendations for Income Enhancement

### Institutionalizing Collective Marketing Mechanisms



**Farmer Producer Organizations (FPOs):** Establish NTFP-specific FPOs in Jharkhand, modelled after Odisha's ORMAS, to aggregate produce, negotiate bulk prices, and bypass intermediaries. Pilot projects in Pakur and Rayagada show FPOs can increase incomes by 35–50% through collective bargaining.



**Women-Led Microenterprises:** Develop women's collectives for value-added products (e.g., mahua oil, tamarind candy) with CSR funding from corporations like ITC and Dabur, which have pledged ₹2.5 crore for tribal entrepreneurship in Odisha.



**Procurement Centres:** Establishment of procurement centres for NTFP and MAPs through partnerships with NGOs and Van Dhan Vikas Kendras (VDVKs). These collaborations address systemic gaps in tribal income generation while aligning with the Minimum Support Price (MSP) mechanism and value-chain development objectives. State Agencies (SAs) engage Primary Procuring Agencies (PPAs), including NGOs, self-help groups (SHGs), and village-level committees, to operate procurement centers. VDVKs, which cluster 15–20 tribal gatherers into collectives, can be leveraged to standardize primary processing. In Kandhamal (Odisha), VDVKs increased tamarind pulp yields by 22% through training on de-seeding and solar drying.

## 8.3 Infrastructure and Skill Development



**Mobile Processing Units:** Deploy mobile units across target districts to conduct on-site de-seeding, drying, and primary packaging, reducing post-harvest losses by 30%.



**Certification Hubs:** Partner with NABARD to establish regional labs for organic certification and phytochemical testing (₹10,000–₹15,000 per test), enabling access to premium markets.

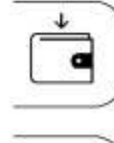


**AI-Driven Market Linkages:** Implement a blockchain platform to connect gatherers directly with buyers like Natural Remedies and Emami, ensuring real-time price transparency and reducing delays in payments.

### Policy Convergence and Sustainable Harvesting



**MGNREGA Integration:** Align NTFP collection with MGNREGA to guarantee 100 days' wages during lean seasons while funding forest regeneration activities.



**MSP Expansion:** Advocate for extending Minimum Support Price (MSP) schemes beyond tendu leaves to cover 15 high-demand species like shikakai and amla, ensuring price stability.



**Cultivation Incentives:** Promote agroforestry models intercropping NTFP species (e.g., ashwagandha, broom grass) with MGNREGA support, boosting yields from 200 kg/ha to 800 kg/ha.

# 09. Ethno-Medicinal Commons and Sustainable Agroforestry Models

CCD facilitated a workshop in Bangalore, bringing together experts, practitioners, academicians, and corporate stakeholders engaged in India's medicinal plant landscape. A central theme that emerged was the urgent need to reimagine community-owned lands granted under the Forest Rights Act (FRA) as ethno-medicinal forests—living spaces that sustain biodiversity while reviving local economies and preserving traditional knowledge.

These FRA lands, often situated in ecologically sensitive and culturally rich landscapes, hold immense potential to serve as analogue forests—ecosystems designed to mirror natural forests while allowing for sustainable human use. However, several threats undermine this vision.

## 9.1 Challenges to the Commons

Many FRA lands, once thriving commons, now face ecological degradation and economic pressure. Programs such as MGNREGA, while vital for rural employment, have inadvertently led to the erosion of topsoil and the clearing of indigenous medicinal plants—many of which are misclassified as weeds and removed during de-weeding operations in the community commons, road sides, tank bunds, and canal bunds. This has resulted in the loss of fragile plants, knowledge systems for primary healthcare, and a decline in soil fertility.

Simultaneously, monocropping practices—often promoted without ecological assessment—have replaced the diverse vegetation once found on these lands. Under pressure from local traders and market forces, community members are frequently coerced into cultivating exotic, water-intensive vegetables such as cauliflower and potato. These crops require excessive chemical inputs and weedicides, disrupting the ecological balance and exposing cultivators to health risks.

The spread of invasive species such as *Lantana camara* in fragile forest ecosystems, *Ipomoea* species in water bodies, and *Prosopis juliflora* in wastelands poses a serious ecological threat. These invasives outcompete native flora, degrade habitat quality, and disrupt ecosystem functions critical for biodiversity and local livelihoods.

## 9.2 Homestead Agroforestry Model on Private Land

In contrast, a homestead model for private landowners offers a resilient alternative. These spaces can be thoughtfully designed to combine ecological protection with livelihood security:

On these lands the following species and methods may be adopted to bring about maximum impact on their livelihoods while conserving biodiversity of different locations.

**Promotion of non-browsable shrub species in fences:** Adaathoda, Chitrak/Koduveli, Nirgundi/Nochi, Safed Musli/Kiluvai, Ratanjoti, Bala/Kurunthotti

**Promotion of deterrent species having itching properties or thorns:** Velvet Bean/ Kapikacchu /Poonakali, Senthatti, Thottal suringi, Rose

**Promotion of timber species of long gestation, but provide annual/perennial income:** Harad/Kadukkai, Teak, Mahua

**Promotion of Gum and Resin yielding species:** Guggul, Salai guggul (Indian frankincense)

**Cultivation of High Value Oilseeds:** Marotti, Ankol

**Promotion of Species Yielding Bark:** Ashoka, Arjuna, Pachunda

**Promotion of Nutri-Homesteads:** Moringa, papaya, Sembaruthi, Banana, Jackfruit

**Cultivation of flowers with commercial and cultural value:** Rose, Hibiscus, Chamomile, Jasmine

Species such as coconut, guava, sitaphal (custard apple), banana, chikku (sapota), curry leaf, mehendi (henna), papaya, and drumstick (Moringa) not only offer regular and seasonal income, but also support nutritional security and local market demand. These trees are well-suited for intercropping with medicinal and native species and can thrive in diverse agro-climatic zones with minimal chemical input.

Beyond self-sufficiency, homestead farms can reduce dependency on weekly haats for essentials by growing diverse crops and medicinal plants. Over time, these models can be organized into collection and supply routes—similar to milk routes—for aggregating farm output, distributing inputs, and even supplying groceries.

Such homesteads embody the principles of forest stewardship, enabling communities to act as custodians of biodiversity. These models could benefit from certification frameworks like FairWild and community-led labelling initiatives, ensuring traceability and fair returns for producers.

### 9.3 Integrated Farming for Patta Lands

For individual patta landholders, integrated farming systems—designed in harmony with local agro-ecological conditions—can enhance both **food security and livelihood resilience**.

- **In undulated landscapes, constructing field bunds alongside a farm pond enables effective rainwater harvesting. Integrating aquaculture in the pond and building a poultry shed above it creates a closed-loop system, where poultry droppings fertilize the water, promoting fish growth—minimizing waste and maximizing productivity.**
- **Fodder from Pond Bunds: The bunds around the pond can be used to grow high-protein, chemical-free fodder crops such as Stylo, Guinea grass, and Napier hybrid, ensuring a sustainable feed supply for cattle and promoting organic dairy farming.**
- Promoting organic cultivation of native or GI-tagged crops, particularly those rooted in the cultural fabric of Jharkhand and Odisha, can revive traditional diets and biodiversity. These include:
  - Traditional paddy varieties such as Kalinga, Kalajeera, Lal Bhat, and Sahbhagi Dhan.
  - Colored rice like Black rice (Chakhao), Red rice, and Brown rice.
  - Minor millets like Kodo, Little Millet (Kutki), Foxtail Millet, and Barnyard Millet.
  - Local grown pulses such as the drought tolerant kandul dal, black gram, horse gram.

### 9.4 Ethno-Medicinal Forest

Ethno-medicinal forests represent a vital ecological and cultural repository, where biodiversity conservation intersects with traditional health practices and community identity. Across India, especially in tribal-dominated states like Odisha and Jharkhand, forests have long served as living pharmacies, supplying communities with medicinal plants used in Ayurveda, Siddha, and local healing systems. However, the widespread erosion of these resources—driven by monocropping of genetically modified crops, chemical-dependent farming, erosion of top soil by MGNREGA workers clearing frequently, and the unchecked spread of invasive species—has critically endangered both the native flora and the cultural knowledge systems associated with them.

Community forest lands and common property resources distributed under the Forest Rights Act (FRA) offer a unique opportunity to regenerate “analogue forests”—landscapes that mimic native forest structure and species composition while supporting livelihoods. By integrating traditional medicinal plants with local agroforestry practices and reviving indigenous stewardship, these forests can become vibrant, self-sustaining ecosystems. More than conserving individual plant species, such initiatives aim to preserve the symbiotic relationships between people, plants, and landscapes, and to safeguard the intangible heritage—rituals, practices, and beliefs—that continues to guide indigenous communities living in the forest fringes.



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The study was undertaken to deepen our understanding of the potential of plant-based economies and the systemic constraints they face. The report builds on the field experience, institutional knowledge, and collaborative learning of partner organisations, and seeks to contribute to broader conversations around regenerative markets and nature-positive economic transitions.

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