

**FOREST RIGHTS ACT IMPLEMENTATION AND TRIBAL LIVELIHOODS:
A COMMUNITY-BASED FIELD STUDY IN JHARKHAND, INDIA**

A Project Paper

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by

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ABSTRACT

Indigenous Peoples and local communities (IPLC) stewardship of forest ecosystems is now recognized as playing an important role in addressing the global crises of biodiversity loss and climate change. India's Forest Rights Act (FRA) seeks to correct an "historical injustice" from the colonial era by recognizing the rights of indigenous (Adivasi) tribes and other traditional forest dwellers to access and manage forest resources. Although a legislative landmark of international significance, actual implementation of the FRA has not met expectations. This is of particular concern for the Adivasi, the most marginalized sector of Indian society, who are dependent on forests for their livelihoods.

The objective of this study was to understand how Adivasi communities use land and forest resources, how they perceive their FRA rights, and the sort of future they aspire to, as the basis for exploring potential livelihood opportunities related to FRA implementation. Primary research was conducted using participatory rural appraisal (PRA) methods with community and local organization informants, as well as interviews with independent experts.

The main impediment to FRA implementation in the study area was the failure of authorities to provide the official documentation approving community petitions for FRA rights. Without it they cannot legally support their tenure claim or access resources to invest in soil, water, and forest conservation measures. Meanwhile, in desperation to stimulate immediate production, they are becoming more dependent on external inputs that further degrade their resources. These inputs are financed by usurious credit that drives them into debt and migration in search of employment to survive, and makes them more vulnerable to human trafficking and enslavement.

Adivasi elders still possess a wealth of knowledge about forest species, medicinal plants, and traditional farming practices. However, this will be lost if current trends of youth outmigration continue unabated. Although youth interviewed desire improved education, livelihood, and living conditions, most would prefer not to migrate. Their aspirations are related to the farming and non-timber forest product (NTFP) economy of their own region, but deforestation and land degradation jeopardize the viability of this economy. The villages surveyed do have basic norms of natural resource (NR) use, yet they need to be improved and enforced to reverse current degradation processes. Youth need to become actively engaged in NR governance to improve the prospects of their own livelihood aspirations.

A larger structural problem is India's extractive development model, typified by open cast mining, which is an existential threat to the Adivasi and their territories. Badlao Foundation (BF) believes that in cases where mining cannot be stopped, at the very least the rights of people should be protected. They should participate in economic benefits, ecological damage should be minimized, and companies should be responsible for forest and watershed restoration returned to village stewardship. This issue is not unique to India, as the rapid expansion of extractivism and violation of IPLC human rights is a global phenomenon. Despite present-day government policies, India historically and currently is home to leading visionaries of an alternative development paradigm conducive to social justice and balance with nature.

The FRA is an important initiative for India and the world. Its actual implementation will require reconciliation of divergent perspectives from both community and government sectors. Taking the advice of both, it is recommended that legitimate FRA beneficiaries comply with stipulated

protocols and, at the same time, proactively assert their FRA rights. Ideally, a third party (civil society organization or non-governmental organization) would be appointed as a facilitator to navigate the complexities of the FRA process and help all parties understand and fulfill their roles.

NR governance systems need to be well designed and formulated with community participation to ensure compliance. Youth should be integrated in meaningful ways from the beginning and activities made engaging for all participants. Beyond training, practical action and generation of income is needed to sustain operation of community forest governing bodies. The Community Forest Conservation and Management Plan (CFCMP) serves not only to meet FRA legal requirements, but also as a learning aid for participatory planning, negotiation, implementation, and monitoring.

Zoning to optimize land uses is a planning tool applicable to both community forests and to individual/family land holdings of any size. It will help locate and orient the multiple regenerative agriculture and forest-based livelihood opportunities (RAFLO) that are possible. RAFLO is predicated on transforming the current degenerative agriculture model of external input and credit dependence to an alternative model founded on permaculture principles and proven methods of India's 'Zero Budget Natural Farming' (ZBNF) system.

Livelihood choices of youth are key for the future of the Adivasi and their forests. Strategic investment that combines sustainable livelihood with forest/land restoration will provide an alternative to migration. A RAFLO concept for youth integrates agroforestry, value added, and cooperative marketing together with renewable technologies for water, sanitation, energy,

building, and rural industry. Pahal Residential High School is strategically positioned to empower youth to develop these skills through practical application with the guidance and support of the school.

Solutions for Adivasi livelihoods correlate directly with meeting global objectives such as the U.N. Paris Climate Agreement, Biodiversity Convention, and Sustainable Development Goals. It is hoped that this study will provide an initial framework for developing equitable partnerships between Adivasi communities and impact investor/entrepreneurs to help make their rightful mutual aspirations a reality.

BIOGRAPHICAL SKETCH

Jefferson Mecham was born 1 September 1959 in Salt Lake City, Utah. He received a Bachelor of Science in Environmental Studies and Forestry (1988) and a Bachelor of Arts in Geography and International Development (1990) degrees both from Utah State University. After over 25 years of professional experience, mostly based in Ecuador (1991-2016), Jefferson was awarded a Teaching Assistantship to enroll in the Master of Professional Studies in Agriculture and Life Sciences program in the Field of Global Development at Cornell University in 2018. In the Spring-Summer of 2018 he participated in Cornell's Designing Integrative Land Management program and was selected for a research fellowship in collaboration with Oxfam India that is the subject of this paper.

Jeff has broad experience in community-based natural resource management in several countries, especially in forest conservation and land restoration using permaculture design and agroforestry systems. From 1991-1995 he was engaged by the Rainforest Information Centre to lead the technical implementation of the first Andean permaculture project with communities forming part of Ecuador's indigenous federation ECUARUNARI. Afterward, he worked with communities, local governments, civil society organizations, international NGOs, and the Ministry of Environment to lead participatory field studies and develop management plans with conservation initiatives in the Choco Andean Corridor of northwest Ecuador. His work was key to stopping land trafficker invasions and achieving legal declaration of the Cambugan (2001) and Paso Alto (2009) protected forest reserves that were subsequently included in the Municipality of Quito's Andean Bear Corridor (2013) and Choco Andean Biosphere Reserve designated by UNESCO in 2018.

Dedicated to
the Paharia and Santhal peoples of Jharkhand
with gratitude to the communities of
Bara Savaikundi, Bariyarpur, Chota Sindri, Dumartari, Gardih, Ghorawali,
Kusmaha, Mohanpur, Rajabhita, Salodih, Tarobandh, Tilaipara,
and to your faithful allies of the
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Johar – Namaste

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TABLE OF CONTENTS

Biographical Sketch	iii
Dedication	iv
Acknowledgements	v
CHAPTER 1. Background and Objectives	1
CHAPTER 2. Methodology and Activities	7
CHAPTER 3. Results and Discussion	14
3.1. Context	14
3.2. Status of Forest Rights Act Implementation	17
3.3. Agricultural and Forest-based Livelihoods	22
3.3.1. Current Livelihood Status	24
3.3.2. Critical Livelihood Issues	29
3.3.3. Potential Livelihood Opportunities	33
3.3.4. Livelihood Constraints and Migration Pressures	42
3.4. Observations from Village Visits	45
3.5. Gender Equity Issues	49
3.6. Community-based Natural Resource Governance and the FRA	53
3.7. Participatory Rural Appraisal	57
3.7.1. Situation of Communities	57
3.7.2. Situation of Badlao Foundation	60
3.7.3. Local Issues in Global Context	68
3.7.4. Assets, Needs, and Aspirations	74
3.8. Perspectives on Forest Rights Act Implementation	79
CHAPTER 4. Conclusions and Recommendations	84
4.1. Forest Rights Act Implementation and Natural Resource Governance	84
4.2. Community-based Forest Conservation and Management Plan	88
4.3. Regenerative Agriculture and Forest-based Livelihood Opportunities	93
4.3.1. Renewable Technologies and Rural Industries	99
4.3.2. RAFLO Concept for Youth and Pahal Residential High School	102
4.3.3. Partnerships for Action Research, Education, and Investment	106
4.4. Future Prospects	107
APPENDICES	109
1. Map of Godda District	110
2. Map of Sundarpahari Block	111
3. Rapid Survey of Forest Species and Indigenous Knowledge	112
REFERENCES	117

LIST OF FIGURES

1. Temperature and precipitation by month – Godda, Jharkhand, India	32
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LIST OF ILLUSTRATIONS

1. Permaculture land use zones	92
2. Integrating components of the farm	97

LIST OF TABLES

1. Status of FRA Implementation: BF-OIN Project in Sundarpahari	18
2. Agricultural and Forest-based Livelihoods	23
3. Community Livelihood Skills Register	28
4. Promising Agroforestry Crops: Food/Fruit, Multipurpose, and Timber Species	36
5. Promising Agroforestry Crops: Medicinal and Multipurpose Species	37
6. Gender Relations and Land Rights in Hindu and Tribal Societies	50
7. Gender Equity Survey of Female Rural Social Workers	51
8. Existing and Proposed Norms of Natural Resource Governance	54
9. Strengths, Weaknesses, Opportunities, and Threats-SWOT Analysis of Villages	58
10. SWOT Analysis of Villages with BF Staff and Community Mobilizers	59
11. SWOTS Analysis of Badlao Foundation with Organization Leaders	65
12. Skills, Interests, Needs, and Aspirations for the Future-SINAF Interview with Youth	75
13. SINAF Focus Group Discussions with Youth	76
14. SINAF Focus Group Discussions with Women's Self-help Groups	77
15. SINAF Interview with Badlao Foundation Community Mobilizers	78
16. Livelihood Training, Capacity Building, and Resource Needs Identification	79
17. FRA Implementation: CSO and Forest Department Perspectives	80
18. Land Use Zones and Site Design Components	92
19. Regenerative Agriculture and Forest-based Livelihood Opportunities-RAFLO	98

LIST OF ABBREVIATIONS

AAY – *Antyodaya Anna Yojana* (Government of India social welfare program)
AYUSH – Ministry of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy
BF – Badlao Foundation
BIRSA – Bindrai Institute for Research Study and Action
BITM – Badlao Institute of Training and Management
CBD – Centre for Bamboo Development (R&D centre at IPIRTI)
CBNRM – Community-based Natural Resource Management
CBO – Community Based Organization
CCI – Crafts Council of India
CFR – Community Forest Rights
CFCMP – Community-based Forest Conservation and Management Plan
CFRMC – Community Forest Resource Management Committee
CHC – Community Health Centre
CIBART – Centre for Indian Bamboo Resource and Technology
CSB – Central Silk Board (Ministry of Textiles)
CSO – Civil Society Organization
CSR – Corporate Social Responsibility
DLC – District Level Committee
DWO – District Welfare Officer
EICD – External Input and Credit Dependency
FD – Forest Department
FDST – Forest Dependent Scheduled Tribe
FAO – Food and Agriculture Organization of the United Nations
FGD – Focus Group Discussion
FLR – Forest and Landscape Restoration
FPIC – Free, prior, and informed consent
FRA – ‘Forest Rights Act’: The Scheduled Tribes and other Traditional Forest Dwellers
(Recognition of Forest Rights) Act, 2006
FRC – Forest Rights Committee
GHG – Greenhouse gas
GVT – Gramin Vikas Trust
ICAR – Indian Council on Agricultural Research (Ministry of Agriculture and Farmers Welfare)
ICDS – Integrated Child Development Service (Ministry of Women and Child Development)
IFA – Indian Forest Act (1865, 1878, 1927)
IFR – Individual Forest Rights
IFS – Indian Forest Service (entity of the MoEFCC)
ILC – International Land Coalition
ILM – Integrated Landscape Management
INBAR – International Network for Bamboo and Rattan
IPIRTI – Indian Plywood Industries Research and Training Institute (entity of the MoEFCC)
IPLC – Indigenous Peoples and local communities
IWDP – Integrated Wasteland Development Programme (Department of Land Resources)
KVIC – Khadi & Village Industries Commission (Ministry of Micro, Small & Medium Enterprise)

KVK - Krishi Vigyan Kendra (Agricultural Science Center in Godda of the GVT)
 IFR – Individual Forest Rights
 JJBA – Jharkhand Jangal Bachao Andolan (Jharkhand Save the Forest Movement)
 MAFW – Ministry of Agriculture and Farmers Welfare
 MCF – Ministry of Chemicals and Fertilizers
 MFP – Minor Forest Produce
 MGNREGA – Mahatma Gandhi National Rural Employment Guarantee Act
 MIDR – Mining-Induced Displacement and Resettlement
 MoEFCC – Ministry of Environment, Forest, and Climate Change
 MoTA – Ministry of Tribal Affairs
 NABARD – National Bank for Agriculture and Rural Development
 NBM – National Bamboo Mission (Ministry of Agriculture and Farmers Welfare)
 NGO – Non-Government Organization
 NR – Natural Resources
 NRLM – National Rural Livelihood Mission (Ministry of Rural Development)
 NTFP – Non-Timber Forest Products
 OBC – Other Backward Class
 OIN – Oxfam India
 OTFD – Other Traditional Forest Dweller
 PCA – Paris Climate Agreement
 PRA – Participatory Rural Appraisal
 PRADAN – Professional Assistance for Development Action (Indian national-level NGO)
 PRI – Panchayat Raj Institution (local governing assembly)
 RRI – Rights and Resources Initiative
 PVTG – Particularly Vulnerable Tribal Groups
 RAFLO – Regenerative Agriculture and Forest-based Livelihood Opportunities
 SC – Scheduled Caste
 SDGs – Sustainable Development Goals (United Nations)
 SDLC – Sub-Divisional Level Committee
 SFURTI – Scheme of Fund for Regeneration of Traditional Industries (MSME)
 SHG – Self-help Group (*Mahila Sabha*) women’s village organizations
 SINAF – Skills, Interests, Needs, Aspirations for the Future
 SLMC – State Level Monitoring Committee
 SRI – System of Rice Intensification
 ST – Scheduled Tribe
 SWOT – Strengths, Weaknesses, Opportunities, Threats
 TISS – Tata Institute of Social Sciences
 UNDP – United Nations Development Program
 UNDRIP – United Nations Declaration on the Rights of Indigenous Peoples
 WADI – Wasteland Agricultural Development Initiative
 ZBNF – Zero Budget Natural Farming

PREFACE

The original title of this paper was ‘Understanding Implementation of the Forest Rights Act and the Past and Future of Forest Use, Norms, and Rights: A community-based field study with Paharia and Santhal Villages of Sundarpahari Block, Godda District, State of Jharkhand, India.’ It was prepared for and presented with additional information in a distinct format as a report to Oxfam India and the Badlao Foundation as part of a research fellowship under the auspices of Cornell University’s Designing Integrative Land Management Program.¹

¹ See: <https://portal.nifa.usda.gov/web/crisprojectpages/1012181-designing-integrative-land-management.html>.

CHAPTER 1

Background and Objectives

With many variations, ‘**sacred forest**’ and ‘tree of life’ are themes common to the origin stories or beliefs of many indigenous spiritual traditions and world religions. Modern science has arrived at a clear understanding of the vital role of forests in global carbon, climate, and hydrological cycles and as original home for most terrestrial life forms, including humans. We know that our Anthropocene extinction and climate crises are due largely to the destruction of our forests. Attempting to address the consequences, global accords such as the [Paris Climate Agreement](#) now officially recognize the importance of forests for securing our collective future.²

The **fate of the forests** is intertwined with that of its ancestral stewards: the Indigenous Peoples and local communities (IPLC) who still call these places home and depend on them for their sustenance. Although the Paris Agreement recognizes the importance of forests as carbon sinks, it did not adequately consider land rights of IPLC. Near 1.5 billion people (20% of world population) are IPLC dependent on collectively managed land and natural resources. Of these, 370 million are indigenous people. While they have only 5% of the global (and 25% of the total IPLC) population, indigenous territories contain 25% of the total carbon in the world’s tropical forests and 80% of the planet’s biodiversity. IPLC collectively protect over half of the world’s land area but have

² United Nations Paris Agreement: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>. See also: U.N. [Convention on Biological Diversity](#); www.cbd.int/convention; www.cbd.int/sp/targets; U.N. [Sustainable Development Goals](#): <https://sustainabledevelopment.un.org/topics/sustainabledevelopmentgoals>; [New York Declaration on Forests](#): <https://forestdeclaration.org>.

formally recognized ownership to less than 20%, and thus are vulnerable to dispossession by more powerful actors (Oxfam, ILC, RRI, 2016; Sobrevila, 2008; Stevens *et al.*, 2014).³

Rates of **deforestation and ecological degradation** in the territories of IPLC are far less than half of those elsewhere. Where IPLC land and resource rights are formally recognized, the incidence is even lower. IPLC invest substantially in protecting and managing their forests, accomplishing results similar to those attained by government-established conservation areas at a fraction of the cost (Porter-Bolland *et al.*, 2012).⁴ When forest peoples are forced to abandon their homelands due to uncertain tenure rights and dispossession by unsustainable development (e.g., dams, mining, colonization) or climate disasters (floods, droughts), the forests lose their best caretakers, communities lose their traditional livelihoods and cultures, and we all will suffer the global consequences. To prevent this, recognition and support of IPLC territorial rights are crucial.

India is the world's largest democracy, second most populous country, and one of the most biologically and culturally [diverse](#) nations on Earth. Its biocultural diversity is largely due to its forests that constitute over 21% of the country's geographical area.⁵ **Indian forests** play a key role in the national economy with over 200 million people (17% of India's population) dependent on forests for their livelihood, of which over half are indigenous peoples.⁶

³ See also RRI 2012, 2015, 2017: <http://rightsandresources.org/wp-content/uploads/2017/09/Stockholm-Priorities-and-Opportunities-Brief.pdf>; <https://forestdeclaration.org/images/uploads/resource/2019NYDFGoal10.pdf>. International Land Coalition (ILC), Oxfam, and Rights and Resources (RRI) lead the global campaign 'Land Rights Now' for Indigenous and community land rights (www.landrightsnow.org).

⁴ See also Solution #39 in Hawken *et al.* (2017). Drawdown: The most comprehensive plan ever proposed to reverse global warming: www.drawdown.org/solutions/indigenous-peoples-forest-tenure.

⁵ Source: [Forest Survey of India](#) 2011: www.fsi.nic.in.

⁶ Source: Census 2011: www.censusindia.gov.in.

The world's largest population of indigenous people are the **Adivasis of India** (Faizi and Nair, 2016). In Hindi, [Adivasi](#) means 'original inhabitants' and is the self-designation used by tribal groups. [Scheduled Tribe](#) (ST) is the category for indigenous (Adivasi) people recognized in the [Constitution of India](#).⁷ Around [600 ST](#) summing to over 104.5 million people constitutes about 8.6% of India's total population of over 1.2 billion.⁸ ST groups with a unique cultural identity and who are more isolated from the national community are classified as [Particularly Vulnerable Tribal Groups](#) (PVTG) in need of special programs for their social and economic development. Seventy-five tribal communities in 18 States, including the Sauria Paharia in Jharkhand, have been identified as PVTGs.

Adivasis are primarily **forest dwellers** who have depended on forests for their livelihood and identity since time immemorial. These include hunter-gatherers, farmers, and pastoralists who reside within the forest or mountainous tracts adjoining forest areas. Unlike castes, which are integrated into wider local economies, tribes form more self-sufficient economic units based in specific territories. Adivasi society tends to be egalitarian and land-use rights traditionally derive simply from tribal membership.

Throughout history, with the rise and fall of multiple ruling dynasties in India, the Adivasi have struggled to defend their **ancestral homelands**. European intervention during the period of [Colonial India](#) (1434-1947), and especially the [British East India Company](#) (1757-1858) and the [British Raj](#) (1858-1947), transformed the political landscape and instigated tribal revolts to

⁷ Article 342 of India's Constitution defines a 'tribe' as "an endogamous group with an ethnic identity; who have retained their traditional cultural identity; they have a distinct language or dialect of their own; they are economically backward and live in seclusion, governed by their own social norms and largely having a self-contained economy."

⁸ **Source:** Census 2011: www.censusindia.gov.in.

challenge alien rule. The failure of the Independence War of 1858 only intensified British exploitation of national wealth and resources.⁹

The **Indian Forest Act of 1865**, and subsequent amendments in 1878 and 1927, radically altered the nature of Adivasi common property by claiming it as State property without adequate provision for the rights of tribal and other traditional users. It authorized the British to declare any land with tree cover as a government forest and to establish regulations to manage it. Policy was centered on revenue generation and meeting demand for timber, especially for the expanding railway network. ‘Scientific forestry’ was fixated on production of valuable hardwoods (e.g., teak, rosewood, saal) by clearcutting natural forests and converting them into mono-specific timber plantations.

The [Indian Forest Act of 1927](#) (IFA) defined and regulated ‘reserved forests’, ‘protected forests’, and ‘village forests’; imposed duties and controlled transit of timber and other forest produce; and established penalties for violations of the Act.¹⁰ The IFA and related policies have, with few exceptions, undermined the subsistence economy of the Adivasi and other traditional forest dwellers.¹¹ Millions have been denied rights to access forest resources and subjected to persecution and removal for being ‘trespassers’ in their own homeland.¹² Meanwhile, huge areas of forest have been lost to industrial logging and timber mafias that bribe officials to exploit reserved forests; and

⁹ See: www.yourarticlelibrary.com/india-2/tribal-movement-in-india-before-and-after-independence-2796-words/6141. “Since the early years of the East India Company, no other community in India offered such heroic resistance to British rule or faced such tragic consequences as did the Adivasi tribes of now Jharkhand, Chhattisgarh, Orissa, and Bengal. Uprisings were quelled only through massive deployment of troops across the region.”

¹⁰ Villagers are prohibited from removing anything from reserved forests, either for personal or commercial use. They may be permitted by the Forest Dept. to take wood from protected or village forests for domestic fuel or house building.

¹¹ In addition to the IFA, other major natural resource policies include the [National Forest Policy](#) (1894, 1952, 1988), [Wildlife Protection Act](#) (1972), [Forest Conservation Act](#) (1980, 1988, 1992), and the [Biological Diversity Act](#) (2002). Since 1988, [Social Forestry](#) and [Joint Forest Management](#) (JFM) schemes have been more inclusive with communities.

¹² See: www.theguardian.com/world/2019/feb/22/millions-of-forest-dwelling-indigenous-people-in-india-to-be-evicted.

millions of hectares of biodiverse forest and grassland have been replaced with commercial tree monocultures, mines, and industrial development with Forest Department approval. The IFA debilitated traditional conservation and management systems and obliged villagers to choose between forsaking their forests or living as ‘outlaws’.¹³

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act of 2006, better known as the [Forest Rights Act](#) (FRA), is a landmark law to “undo the historic injustice” and “strengthen the conservation regime” by acknowledging traditional forest dwellers’ rights and their role in forest and wildlife management. The Act provides for limited ownership rights to the forest land they live on and cultivate (up to 4 hectares); rights to own, access and use grazing lands, water bodies, and minor forest produce; and rights to protect, conserve and regenerate community forest resources including wildlife and biodiversity.¹⁴ Beyond its significance for India, the FRA is a major case study of the global movement toward decentralization of natural resource governance and rights-based approaches to development (Lee and Wolf, 2018; Kumar and Kerr, 2012; Sarin, 2014; and Siripurapu *et al.*, 2016).

Oxfam India (OIN) applies a rights-based approach to address fundamental issues of poverty and inequality in India and is one of the leading NGOs working to support implementation of the FRA. OIN engages with local civil society organizations to develop the capacity of the poor to negotiate

¹³ **Source:** Campaign for Survival and Dignity (<https://forestrightsact.com>) and Srivastava and Singh (2012: 74-77). C. Singh (1986) concludes: “The basic reason for rural and tribal poverty... is nothing but the privatization of common property resources in a non-equitable manner... The state monopolizes resources so that it can make these available to specific private industries.” See also: Gadgil and Guha, 1993; Das, 2012.

¹⁴ See: <https://forestrightsact.com/what-is-this-act-about>. FRA beneficiaries must demonstrate primary residence on forest lands and dependence on forests for their livelihood as either a Forest Dependent Scheduled Tribe (FDST) or Other Traditional Forest Dweller (OTFD) for a period of at least 75 years (3 generations) prior to 13 December 2005.

the terms of their political and economic inclusion.¹⁵ In the State of Jharkhand, OIN is collaborating with one of its local partners, the Badlao Foundation, to improve access and jurisdiction of Adivasi communities over their forest territories and resources.

Badlao Foundation (BF) is a civil society organization registered in 1982 under the Indian Trust Act of 1882. ‘Badlao’ means ‘change’ in Hindi and BF is dedicated to catalyzing fundamental socio-economic changes in the lives of excluded people: Paharia and Santhal tribes, Dalits, minorities, women and children, landless laborers, and marginalized farmers in the region of Santhal Pargana of northeast Jharkhand. The BF mission is to promote livelihoods and rights of tribal populations and other underprivileged communities with special focus on women; and strengthen village and local institutions for effective delivery of public services (Srivastava and Singh, 2012).

The **objective of this study** with Paharia and Santhal communities was to attain a better understanding of: 1) how community members (young, old, men, women) use land and forest resources; 2) the nature and status of local systems of natural resource protection and governance; 3) how villagers perceive their rights in the context of the Forest Rights Act, and 4) what sort of future they aspire to.¹⁶ On this basis, potential livelihood opportunities related to FRA implementation will be proposed in accordance with villagers’ own vision for the future and in the context of threats and opportunities emerging nationally and globally.

¹⁵ See: Oxfam India (www.oxfamindia.org). Policy Briefs about the FRA include: No. 9 - Implementing the Forest Rights Act: Addressing an historical injustice (Dec. 2013); No. 15 - Implementing the Forest Rights Act: Lack of political will? (Nov. 2015); No. 26 - Mobilising communities to claim Community Forest Resource Rights in Jharkhand (Apr. 2017).

¹⁶ **Source:** Oxfam India, Terms of Reference (July 2018).

CHAPTER 2

Methodology and Activities

This capstone paper is based on primary research and literature reviews following the **areas of engagement** specified in the Terms of Reference (ToR) by Oxfam India:

- Document community understanding of the village-institution (*Grahm Sabha*) and the need for protective legislation like the Forest Rights Act (FRA); and existing community rules, regulations, and mechanisms related to natural resource (NR) use and management;
- Record and analyze the current involvement and future interest of different groups, especially the youth (male and female), in NR-based livelihoods;
- Identify the training and capacity building needs of community members and Badlao Foundation (BF) community mobilizers related to NR management; and
- Present recommendations to orient the process of developing Community-based Forest Conservation and Management Plans (CFCMP) and related livelihood opportunities.¹⁷

Primary field research was from three sources: 1) individual and focus group discussions with community members and BF field mobilizers; 2) interviews with BF leaders and other experts on the FRA and NR livelihoods; and 3) observations and experiences from field visits and events. The field portion of this study was conducted from 13 July to 11 August 2018.

¹⁷ OIN–ToR and meeting with Ranjana Das (OIN Coordinator, Bihar/Jharkhand) and team in Patna, 13 July 2018.

Key informants to this study were:

- Communities: Bara Savaikundi, Bariyarpur, Chota Sindri, Dumartari, Gardih, Ghorawali, Kusmaha, Mohanpur, Rajabhita, Salodih, Tarobandh, and Tilaipara.
- BF field mobilizers: Benjamin Hansda, Salomi Hansda, Betka Hembrom, Masih Kisku.
- BF leaders: Rajesh Yadar and Krishna Jee (based in Domdih), and Arvind Ji, Bajrang Singh, Asha Rathan, and Atal Bahari Sharma (based in Mihijam).
- Experts on FRA: Sanjay Basu Mullick (Jharkhand Save the Forest Movement) and D.K. Sriwastawa (Indian Forest Service).
- Experts re NR livelihoods: Rajesh Choudiary (PRADAN), Ravi Shanker (KVK Godda), Sapna Surin (OIN Jharkhand).
- Field visits and events: Chandna *Haat* Market; Community Health Center of Sundarpahari; PRADAN Sericulture Hatchery; KVK Agricultural Science Center; Mohanpur Upgraded Middle School; Inauguration of the Pahal Residential High School of BF at Domdih; Silk Spinning and Weaving Mill at the BF Gandhi Ashram in Kewatjali; Gender Equity Survey with women attending ICDS *Anganwadi Sevika* job training course; BF Rajwadi cotton spinning and tailoring center; Green Wood Public School and Indira Gandhi Open University; BF Main Office and Khadi retail clothing shop in Mihijam; Badlao Institute of Training and Management in Ranchi.

Bilingual questionnaires (English-Hindi) were prepared to facilitate informal Participatory Rural Appraisal (PRA) surveys and semi-structured discussions with villagers on topics of livelihood, norms of NR governance, and situation analyses such as Strengths-Weaknesses-Opportunities-Threats (SWOT) and Skills, Interests, Needs, and Aspirations for the Future (SINAF).

Questionnaire/ focus group discussion assignments were distributed among team members and BF staff to obtain more data given the language barriers and short time available. Information gathered was triangulated between villagers, translators, and researchers to confirm or correct our understanding. This was particularly important since at least three languages were engaged (English, Hindi, Santhal or Paharia) and we had only one trilingual translator.

Expert interviews were individual or small group (2-3 people) semi-structured discussions with leading questions and an open-ended format. The facts on FRA implementation and gender relations and land rights were systematized from the results of these interviews. A listing of promising agroforestry crops integrates indigenous knowledge gathered on the village forest walks, information from scientific and grey literature, and from a visit to the KVK Agricultural Science Center.¹⁸ The gender equity survey was a brief questionnaire and discussion with a large group conducted in under one hour.

Participatory rural appraisal (Chambers, 1994), appreciative inquiry (Barrett and Fry, 2005), regenerative design (Mang and Reed, 2011), and embracing complexity (Lamb *et al.*, 2019) describe concepts that informed our approach to the discussions with villagers. By starting the conversations around their own unique story, skills, and insights, rapport was established as the basis for addressing more difficult issues.¹⁹ Villagers especially enjoyed the forest walks and being

¹⁸ See related papers: Agrawal, 1995; Berkes *et al.*, 2000.

¹⁹ Villagers are not used to being appreciated by outsiders. For example, in Tarobandh villagers were initially reticent to talk with us, concerned that our attitude toward them would be judgmental. After we spoke to them in recognition of merits we readily observed (e.g., own language, children treated kindly, community solidarity), they thanked us and the discussion proceeded smoothly.

in the position of esteemed experts imparting their plant lore. Children and other villagers appeared spontaneously, as if out of nowhere, to join us.

Assistance in translation and data recording was led by Mr. Betka Hembrom (Santhal-Hindi-English), Mr. Saket Anand, and Mr. Vaishnav Venu (Hindi-English). Transcription of field notes and species research assistance was provided by Ms. Omisha Manglani, an undergraduate student at Cornell University from Mumbai, India. Due to the limited sample size with information on multiple complex topics gathered in a short time over a large area, data analysis is qualitative only. This paper aims to set our interviews and observations *within the broader ecological, legal, economic and political context* and to *be appropriate for academic, practitioner, and community audiences*.²⁰

3. The following are the **main field activities** carried out during July and August 2018:

- Orientation meeting with Ms. Ranjana Das and her team at the Oxfam India, Bihar-Jharkhand office in Patna (13 July).
- Train from Patna to Jisidih, met by Mr. Krishna Jee and road trip to Badlao Foundation – Domdih (BF-D). Orientation and discussions with BF-D team members and project staff for background and to start building understanding of the organization and their work with communities in Sundarpahari – Godda (14 and 15 July).

²⁰ Oxfam India, Terms of Reference (July 2018).

- Initial exposure in the field participating with Tata Institute of Social Sciences (TISS) team (Drs. Abhilash and Aindrila Ganguly) researching FRA implementation process through FGD with *Grahm Sabha*, FRC and CFRMC members in the villages of Bara Savaikundi, Tilaipara (16 July), Chota Sindri, Ghorawali, and Salodih (17 July).
- Planning with Badlao Foundation Team lead by Mr. Rajesh Yadar about village field visits and meetings in the area of Sundarpahari Block, Godda District (18 July).
- Visits to villages *Grahm Sabha* of Kusmaha (19 July), Bara Savaikundi (20 July), Gardih (23 July), Rajabhita (24 July), Bariyarpur (25 July), and Salodih (26 July) to discuss and document about NR and NTFP-based knowledge, practices, and livelihoods; and existing norms related to NR governance. Also visited the Chandna *haat* market (19 July) and the Community Health Centre of Sundarpahari (25 July).
- Participation in FRA Camps at Sidhu Kanhu Ashram of BF at Domdih with discussions about importance of FRA, current problems, and future aspirations (21 July) and workshops with *Grahm Sabha* FRC and CFRMC members, tribal youth (male), and women's group (27 July).
- Participation in inauguration of Pahal Residential High School of BF at Domdih and interaction with children, BF staff, and donor representative. Meeting with Mr. Arvind Ji (BF Executive Secretary), Mr. Rajesh Yadar, and Mr. Krishna Jee. Reception and review of BF organizational literature and project documents (22 July).
- Project documentation and meetings with BF Domdih staff about FRA processes in Sundarpahari and planning final week of field work (28 to 30 July).

- Visit to village of Chandna women's group leaf plate enterprise; village of Tarobandh (Paharia) for a community discussion on SWOT and FGDs on forest and youth livelihoods, and an afternoon FGD in Gardih with youth from Dumartari, Kusmaha, Chota Savaikundi, and Rajabhita (31 July).
- Visit to Mohanpur Upgraded Middle School with teachers and children, and focus group discussion (FGD) with women's self-help groups: *Mahila Sabha Upartola Mohanpur, Mahila Sabha Nichetola Mohanpur, Mahila Sabha Lowertola Mohanpur*. Visit to the village of Bariyarpur for FGDs with youth and livelihood groups (1 August).
- Visits in two groups to conduct FGD mainly with youth on livelihoods, SWOT, and SINAF in Kusmaha and Gardih (2 August).
- Tour of PRADAN Sericulture Hatchery in Domdih with its manager (Mr. Rajesh Choudiary). Trip to Godda for appointment to meet with the District Welfare Officer (he did not attend). Visit to Gramin Vikas Trust (GVT) – Krishi Vigyan Kendra (KVK) Agricultural Science Center guided by its director (Dr. Ravi Shanker) and staff (3 August).
- FGD meeting with BF-OIN project field mobilizers on FRA topics of norms, livelihoods, SWOT, and their own needs and aspirations as a team (4 August.).
- Village walk and farewell to BF staff at Domdih. Travel by auto to the BF Gandhi Ashram training center in Kewatjali (Mihijam) where we were given a tour of the facilities (5 August).
- Tour of the Green Wood Public School and visit with teachers and students in 4th and 10th grades. Interview with BF founders Mr. Bajrang Singh and Ms. Asha Rathan. Visit to BF Main Office in downtown Mihijam for interview with Mr. Arvind Ji (BF Executive Secretary) and introduction

to Mr. Atal Bahari Sharma (BF Field Coordinator). Visit to BF Khadi retail clothing shop at street level in the same building (6 August).

- Gender Equity Survey and discussion with women attending the ICDS *Anganwadi Sevika* job training course. Tour of Silk Spinning and Weaving Mill at the BF Gandhi Ashram. Visit to BF Rajwadi Tailoring Center. To Green Wood Public School for interview with Mr. Bajrang Singh and Mr. Atal Bahari on BF experience, SWOT, and strategy. Night train from Mihijam to Ranchi with Mr. Rajesh Yadav, Mr. Betka Hembrom, BF-OIN project field mobilizers and youth participants from the villages (7 Aug.).

- Arrival at Badlao Institute of Training and Management (BITM) in Ranchi for FRA training course with community mobilizers and village youth. Met Ms. Sapna Surin (OIN Jharkhand Coordinator) and we went for interview with Dr. Sanjay Basu Mullick, Director of the Jharkhand Save the Forest Movement, about their FRA and NTFP experience (8 Aug.).

- Last day of FRA training and farewell to Rajesh, Betka, BF field mobilizers and village youth. Interview with Ms. Sapna Surin at BITM in Ranchi (9 Aug.).

- Interview with Dr. D.K. Sriwastawa, Principal Chief Conservator of Forests, Jharkhand (Retired) at his home in Ranchi, about his perspective and experience with the FRA and his Ph.D. research completed on ethnobotany in Santhal Pargana (11 Aug.).

CHAPTER 3

Results and Discussion

3.1. Context

The State of **Jharkhand** in eastern India is one of the country's newest states, partitioned from the State of Bihar in the year 2000.²¹ '[Jharkhand](#)' means 'the land of forest' in various Indo-Aryan languages and is home to 32 indigenous (Adivasi) tribes including the [Paharia and Santhal](#).²² The subjects of this study are located in the Rajmahal Hills in the Godda District of Santhal Pargana Division in the northeast of Jharkhand at approximately 25°N 87°E. The **Rajmahal Hills** span an area of over 2500 square kilometers oriented north-south with an elevation range of 180 to 330 meters above sea level and form part of the [Ganges River](#) watershed. Today, most of the region is occupied by the Santhal with more remote upland areas inhabited by the Paharia.

The **Sauria Paharia** are listed as a primitive tribe and particularly vulnerable tribal group (PVTG); with a population of 31,000 they constitute less than 1% of the total population of the tribes of Jharkhand (Singh, 2005). They are the original inhabitants of Rajmahal who were never conquered by the Mughals and were not subject to the British until 1765. In the [history of Jharkhand](#), the Paharia Revolt (1772-1780) and the uprising led by [Tilka Manjhi](#) (1780-1785) were among the first armed rebellions against the British in India, ultimately obliging colonial authorities to pass tenancy laws recognizing tribal lands and rights (Verma, 2000-2001). In 1832 the Paharia gained title to 1338 square miles (3465 km²) in the forested Rajmahal Hills, called the *Damin-i-Koh* "in

²¹ Map of Jharkhand: www.mapsofindia.com/jharkhand.

²² Jharkhand's 32 Scheduled Tribes with over 8.64 million inhabitants represents 26% of the states' total population of 33 million (Census 2011: www.censusindia.gov.in).

the lap of the hills”. This area was demarcated as part of a settlement with the British that included exclusive land tenure and permission for tax-free cultivation of their crops. This agreement was not fulfilled. Today the Paharia live in the most marginal areas and their population is declining due to food/water insecurity, deforestation, displacement by mining, and migration.

The **Santhal** is the largest Scheduled Tribe (ST) in the state with over 2.7 million people representing 26% of the total ST population of Jharkhand. Santhals began moving into the Rajmahal from west Bengal after their lands were seized and designated to [Zamindar](#) landlords by decree of the [Permanent Settlement](#) of 1793. This law was imposed by the [British East India Company](#) to maximize revenues by coercing landlords and farmers to produce more cash crops. The British coveted the timber and coal of the densely forested Rajmahal, but since the Paharia refused to clear their forests, a large area in *Damin-i-Koh* (Paharia territory) was opened for settlement of the Santhals to provide cheap labor. The population in this tract increased from 3,000 in 1838 to 80,000 in 1850. The [Santhal rebellion](#) (1855–1857) led by [Sidhu and Kanhu Murmu](#) arose against the ruthless exploitation of the British revenue and Zamindari system. The revolt was crushed by the army and [Santhal Pargana](#) was formed as an administrative division in its aftermath.²³

Godda District is located in the northeast of the Santhal Pargana Division of Jharkhand (see Appendix 1. Map of Godda District). Around 80% of its population of 1.3 million (2011 Census) is dependent on farming, livestock raising, non-timber forest products, cottage industries and handicrafts for their livelihoods. Agriculture is rainfed and drought prone since erratic monsoons

²³ Santhal Pargana Tenancy Act: <http://allindiaaseca.org/spta.html>.

and lack of irrigation are major limitations to productivity. Most of the population lives in poverty and lacks access to basic public services (Roy, 2012).

Godda is rich in **coal deposits** with the Rajmahal Coalfield located in the Boarijore, Mahagama, and Sundarpahari Blocks. The Rajmahal open cast coal mine, opened in 1985, produces around 15 million tons annually. It is among the larger mines in India and supplies coal to the [Frakka](#) (2100 MW) and [Kahalgau](#) (2340 MW) Super Thermal Power Stations. Coal production was projected to increase to supply the 1320 MW Jindal plant in Nipania-Sundarpahari-Godda, but these plans have been delayed as a result of the Indian Supreme Court decision in the ‘[Coalgate Scandal](#)’.

This region is also home to the **Rajmahal Formation** of volcanic origin with plant fossils dating from the Jurassic Period (70 to 150 million years ago). Their discovery attracted international attention of geologists and paleobotanists, prompting the Geological Survey of India to declare it as a [National Monument](#) to promote the area’s protection and to stimulate geotourism. However, this potential is threatened by [mining leases](#) and Paharia [tribal villagers](#) have taken the lead to protect these areas. In addition to the Paharia and Santhal peoples, mining imperils many other [Adivasi tribes](#), local communities, and [wildlife habitat](#) including biological corridors throughout Jharkhand and neighboring states in eastern India.

The health, environmental, and economic impacts of air and water pollution from **coal power** affect the entire country and beyond at the level of global climate and hydrological cycles.²⁴ Even without accounting for total life-cycle [costs of coal](#), market costs of renewable energy in India are

²⁴ See: CAT, UE. 2014. [Coal Kills: Health impacts of air pollution from India’s coal power expansion](#).

now less than coal.²⁵ As such, investment in new coal-fired plants are destined to become stranded assets. Rather than phase out coal in favor of more economical alternatives, government policies to ‘fast track’ [mineral auctions](#) are escalating ‘Mining-Induced Displacement and Resettlement’ (MIDR) harmful to Indian society and especially to the tribal peoples most directly affected (Singh, 2015).²⁶

Sundarpahari Block is one of nine blocks (subdistricts) located in Godda District (see Appendix 2. Map of Sundarpahari Block). According to the 2011 Census, there are 0 towns and 298 villages with a total of 14,005 homes and an entirely rural population of 65,463 residing in this Block. The overall literacy rate is 35%: 44% of males and 26% of females are literate. Almost all of the population is dependent on agriculture and non-timber forest products from areas with subsurface deposits of coal.²⁷

3.2. Status of Forest Rights Act Implementation

By contrast to the facility for mining concessions, at national level only **3%** of potential community forest rights have been recognized since enactment of India’s Forest Rights Act in 2006 (CFR-LA, 2016). Table 1 on the next page shows the status of FRA implementation in the area of this study in Sundarpahari Block.

²⁵ Forbes, 30 Jan. 2018: [India coal power is about to crash: 65% of existing coal costs more than new wind and solar. https://www.independent.co.uk/environment/india-solar-power-electricity-cancels-coal-fired-power-stations-record-low-a7751916.html](https://www.independent.co.uk/environment/india-solar-power-electricity-cancels-coal-fired-power-stations-record-low-a7751916.html)

²⁶ MIDR impacts include deforestation, land degradation, air and water pollution, forced migration, disruption of formal educational activities, and health problems.

²⁷ See: www.census2011.co.in/data/subdistrict/2563-sundarpahari-godda-jharkhand.html.

Table 1. Status of FRA Implementation: BF-OIN Project in Sundarpahari Block

Village – <i>Grahm Sabha</i>	FRC			FRA Applications		CFRMC		
	Members	Female	Male	IFR (number)	CFR (acres)	Members	Female	Male
Kusmaha					112.91			
Gardih	15	5	10					
Chandraidih					11.54			
Dumki								
Khepadih	15	6	9		4.96			
Tetariya	15	5	10		10.85			
Bariyarpur	15	5	10		11.11			
Pahadpur								
Kadampur	15	5	10		29.35			
Angwali	12	5	7	8				
Monadih	15	6	9	1	35.76			
Sagar	13	5	8	15	129.63	20	6	14
Chandna	15	7	8		352.90			
Saharpur								
Chota Haripur				14	61.86			
Ghorawali	13	6	7		32.96			
Chota Sindri					111.35			
Dumartari	11	5	6	5	50.65	19	7	12
Bara Savaikundi	15	5	10	32	39.10	20	8	12
Chota Savaikundi	15	5	10	9	17.62	20	8	12
Tilaipara	15	5	10	5	71.40			
Tarobandh	11	5	6			12	4	8
Bara Jolo	12	3	9	11	167.15	18	5	13
Bara Sindri	15	5	10		535.43	16	6	10
Rajabhita	14	5	9					
Maspara	14	5	9					
Domdih	15	5	10		287.73	20	8	12
Tetaria	15	6	9	7	10.85			
Tilabad	15	6	9	33	121.55			
Amjora	12	4	8	13	155.40			
Sundarpahari	15	6	9					
Salodih	15	5	10		127.39	20	8	12
Mohanpur	15	5	10	3	435.24			
Salpatra								
Kusumghati					104.26			
35 Villages	367	135	232	156 claims 104 acres	25 claims 3018 acres	165	60	105

Source: Badlao Foundation-Domdih (July 2018). Villages visited are highlighted in **bold**. Tarobandh and Tilaipara are Paharia; Rajabhita is mixed Paharia and Santhal; Bara Savaikundi, Bariyarpur, Chota Sindri, Dumartari, Gardih, Ghorawali, Kusmaha, Mohanpur, and Salodih are Santhal.

The **Grahm Sabha** (*Grahm* = village, *Sabha* = gathering) is the village level governing body recognized by Indian national law. It is mandated to have at least one-third of its members as women and to meet at least four times per year. The next organizational levels are the **Panchayat Raj Institution** (PRI: *Panchayat* = assembly, *Raj* = rule) consisting of 10-15 villages (depending on population); **Block** consisting of 10-15 PRI's; **District** (Godda District, for example, is made up of six Blocks); **State** level (Jharkhand has 24 districts grouped into five divisions); and the **National** level (India has 29 states).

Out of 35 villages where BF works in Sundarpahari Block, 27 have **Forest Rights Committees (FRC)** but only nine of these have **Community Forest Resource Management Committees (CFRMC)**.²⁸ Due to the work of the BF-OIN project and the regular meetings of the *Grahm Sabha* and their FRC's, most villagers are aware of the importance of the FRA. In 2013 the project started the process for FRA recognition and tenure entitlement, consisting of the following steps.

- 1) Individuals (for IFR) and communities (for CFR) map the area of their claim and send to the FRC of the *Grahm Sabha* with notice to the *Panchayat* and Block Level Committee.
- 2) *Grahm Sabha* sends a request to the Forest Department (FD) Godda District to verify the area of Community Forest Rights (CFR) and/or Individual Forest Rights (IFR), with a minimum of 5-7 individual claimants needed to obtain an IFR verification visit.
- 3) The FD conducts the site visit to verify boundaries and beneficiary identities and submits its report to the Revenue Department of the Block level government (Sundarpahari).

²⁸ The Forest Rights Committee and Community Forest Resource Management Committee are entities of the *Grahm Sabha*. The FRC role is to prepare, submit, and complete the FRA claim. The CFRMC is responsible for implementing the Community-based Forest Conservation and Management Plan (CFCMP).

- 4) Upon approval by the Block level Revenue Department they send the application to the Sub-Divisional Level Committee (SDLC).
- 5) If approved by the SDLC they submit to the District Level Committee (DLC) in Godda.
- 6) The DLC has the final decision whether or not to grant the recognition of Forest Rights. If approved it is signed by the DLC members headed by the District Welfare Officer, together with the District Forest Commissioner, and the District Head Commissioner.
- 7) The Ministry of Tribal Affairs (MoTA) of the Government of India at the level of the State (Jharkhand) works with the FRC's to complete the project documentation, mapping, and registration to finalize the legal process.

After a process of four years, in 2017 the DLC authorities announced that 26 villages (out of 35 where BF-OIN operates) had their Community Forest Rights (CFR) claim approved. However, despite multiple requests, the official documentation needed to verify and formalize this claim have not been provided to the participating communities or the BF. Although this issue has been discussed repeatedly in the *Grahm Sabha* and forwarded to the *Panchayat* (PRI), lack of concrete action and results at the PRI, block, and district levels have caused many villagers to lose confidence in the FRA process.

Villagers understand their FRA rights at a basic level and are motivated to defend them. However, **disillusionment**, lack of participation or reticence to speak out by many villagers makes it more difficult to pressure government officials to fulfill their duties, and thus to advance the FRA

process. The BF-OIN project provides specific training to villagers and community mobilizers to help overcome such limitations.²⁹

In support of this study, BF had arranged an interview with the **District Welfare Officer (DWO)**, responsible for the FRA in Godda District to discuss his viewpoint on the FRA lost documentation; government plans related to forest-dependent communities; and strategies for strengthening the *Grahm Sabha* to implement the FRA. Unfortunately, this conversation appointed for 3 August 2018 did not take place. Upon arrival at the DWO office in Godda, we were informed that the DWO did not have authorization from his superiors to speak with us. It also appears that, as a recently appointed official, he did not have the background or documentation on this case.

At national level, the **Ministry of Tribal Affairs (MoTA)** raised the following issues about the progress of FRA implementation.

- *High pendency of claims at various levels.*
- *High rate of rejection of claims including claims for Community Rights and CFR Rights.*
- *Non-communication of claims rejections, and when communicated, it is without reasons.*
- *Early review of rejected claims. (State forest authorities move immediately to evict people whose claims under FRA are rejected without waiting for decision on review or appeal).*
- *List of all Grahm Sabhas (as per FRA definition) in which FRA is implemented and constitution of FRCs to be supplied to MoTA and made public.*

²⁹ **Source:** Interviews with Rajesh Yadav and Krishna Jee at Badlao Foundation, Domdih during July 2018.

- *Maintain segregated data for Forest Dependent Scheduled Tribe (FDST) and Other Traditional Forest Dwellers (OTFD) for all claims received, admitted, granted, and rejected.*
- *Sensitization of forest department staff regarding FRA implementation and also on not raising frivolous objections.*
- *Holding State Level Management Committee (SLMC) meetings regularly and making its proceedings available to MoTA.³⁰*

In conclusion, the **failure to implement the FRA** in the study area reflects the situation nationally. Although lack of knowledge and capacity of communities and CSOs is a factor, the main problem is the lack of will of the government agencies involved, especially the Forest Department that appears resistant to share forest jurisdiction and management with the communities. This is of critical concern for the Adivasi since their livelihoods and cultural identity are dependent on agriculture and forest resources.

3.3. Agricultural and Forest-based Livelihoods

Table 2 on the following page outlines the main livelihood activities and problems expressed by participants and observed in the villages surveyed. The following subsections addresses this in greater detail.

³⁰ Communication No. 23011/3/2016-FRA, Government of India, Ministry of Tribal Affairs (<https://tribal.nic.in>), FRA Division to Chief Secretaries of all concerned States of India.

Table 2. Agricultural and Forest-based Livelihoods

Livelihood Activities/ Sources (Cultivation or gathering, processing, and sale in local markets)	Household consumption	Income generation	Season
Farming of staple crops (rice, maize, pulses , millets , barley, sweet potato) and vegetables (tomato, onion, cucumber, sem/green bean, lady finger/okra)	A	A	June–Dec.
Livestock raising (cows, oxen, buffalo, goats, pigs, chickens, ducks)	B	A	All year
Leaf plate making (from leaves of the saal tree Shorea robusta)	B	A	All year
Sericulture (Tasar silkworm Antheraea mylitta cocoons from arjun Terminalia arjuna , asan T. elliptica , and saal trees in native forest)		A	July–August
Fruit (e.g., mango, jackfruit, guava, tamarind, wood apple, palm)	A	A	March–April
Jamun (Syzygium cumini) and mahua (Madhuca longifolia) fruit	B	A	April–May
Wine making from mahua fruit	B	A	May–July
Medicinal plants (e.g., amla, charoli, chirata, neem)	A	B	All year
Mushrooms (e.g., barnabus, phutka)	B	A	July–August
Tendu leaves for making <i>beedi</i> /smokes (Diospyros melanoxylon)	B	A	March–April
Toothbrush (datun) making from twigs of neem (Azadirachta indica)	A	B	All year
Bamboo (Dendrocalamus strictus - for building, implements, sale in <i>haat</i>)	A	A	All year
Firewood (from multiple species, mostly uncultivated)	A	A	All year
Timber (for building material and making home furniture and implements)	A	B	All year
Note: Forests are also valued and understood essential for livelihoods as sources of clean water, pure air, cooler temperatures, and sacred groves.	A = more significant B = less significant		
Livelihood Problems/Issues			
<u>Village Participant Responses:</u> <ul style="list-style-type: none">• Water, food, and income insecurity from unreliable rain, no irrigation, and lack of land and/or secure tenure.• Forest Department (FD) impeding access to villagers’ land and traditional resource areas.• Forest areas are gradually being encroached upon and depleted of timber and NTFP by overharvesting. Deforestation also jeopardizes agriculture and domestic water supply because of subsiding water tables.• Soil erosion and damage to land and crops from deforested watersheds and copious rains of the monsoon season.• Declining soil fertility and crop productivity and increasing crop pests and disease.<div>Fertilization: Most farmers use both manure (mainly cow dung) and chemical fertilizer (urea, DAP, potash). Previously, they used only natural inputs but now dependence on hybrid seeds and chemicals is increasing.</div><div>Pest control: Chemical pesticides are commonly used, purchased in the market and applied on field and vegetable crops. They don’t know the product names (only that they kill pests) and are unaware of their health and environmental hazards.</div>• Dependence on agrochemicals is increasing and on <i>mahajans</i> (moneylenders) to obtain funds to purchase them.• Animals sickening/dying more often, e.g., cows and oxen with leg and mouth diseases, goats and pigs with diarrhea, chickens with flu. Children also frequently ill with diarrhea and rashes.• Damage to crops from incursions by domestic animals wandering loose and lack of fencing. <u>Research Team Observations:</u> <ul style="list-style-type: none">• Low quantity of water for drinking, washing, and bathing as most villages have only one shared fountain.• Sanitation, drainage, and waste management are lacking and/or inappropriate (e.g., flush toilets that are not used).• Dependence on firewood or LPG gas for cooking fuel; pressure on forests and women’s time to gather wood.• Loss of traditional seeds and associated knowledge among younger farmers accustomed to external inputs.• Scarcity of viable livelihood enterprises and lack of practical education, training, and investment to create them.• Need for sustainable alternative solutions to all of the above.			

Source: FGD with *Grahm Sabha* and youth from the villages of Bara Savaikundi (16, 20 July), Tilaipara (16 July), Chota Sindri, Ghorawali (17 July), Salodih (17, 26 July), Dumartari, Tarobandh (31 July), Gardih, Kusmaha (2 August 2018).

3.3.1. Current Livelihood Status

Farming of staple crops, complemented with livestock raising, is the most important source of livelihood for most families in the region. Rice (*Oryza sativa*) is the principal crop in the lowlands, especially among the Santhal, and is entirely dependent on the monsoon rains. Although adoption remains limited, BF has worked extensively with water development projects and promotes water-efficient ecological farming practices such as the System of Rice Intensification (Balamatti and Uphoff, 2017) integrated with *Azolla*, and rotational cropping of grains, pulses, and vegetables.³¹ “Prior to outside influence and propaganda for industrial agriculture, the Adivasi planted only traditional drought and pest-resistant seed varieties in crop associations and rotations that conserved moisture, soil fertility, and limited weed growth. Azolla was planted and served as mulch in rice paddies. Plant residues and animal waste were used to fertilize their fields and control pests. Oil cake of neem and sinduwar (*Vitex negundo*) were applied instead of insecticides” (Srivastava and Singh, 2012: 97).

After farming, **non-timber forest products (NTFP)** are the most important local source of livelihood in the study area.³² However, leaf plate making (year-long) and sericulture (seasonal) are the only NTFP activities documented to generate enough income to earn a living.³³ Normally, men do the heavy labor of cutting timber and bamboo, while women focus on collection of

³¹ The System of Rice Intensification-SRI (<http://sri.cifad.cornell.edu>) increases production while reducing use of water and inputs. SRI is also applicable to other field crops such as maize, millets, wheat, pulses, and vegetables. See: The System of Crop Intensification: http://sri.cals.cornell.edu/aboutsri/othercrops/SCImonograph_SRIRice2016.pdf.

Azolla is a floating blue-green algae that fixes atmospheric nitrogen in symbiosis with *Anabaena*, excellent for integrating with rice-duck-fish farming: <http://theazollafoundation.org/azollas-uses/in-rice-production>.

³² JJBA research on tribal NTFP found that 65% of income of the Munda, Yaroa, and Ho people is from NTFP (Interview: Sanjay Basu Mullick - JJBA, Ranchi, 8 August 2018). CEFS (2005) found 75% of households surveyed depended partially on forest food products throughout the year. Loss of income from sale of minor forest products due to forest depletion was the second most important reason for increased food insecurity.

³³ Brewing of mahua wine making for the local market is also profitable but has only a short season from April-July.

firewood, fodder, and NTFP. This is changing since most youth and adult males must migrate in search of employment. Now forest gathering is done mainly by women along with young boys and elderly men. Women and elders are the principal keepers of NTFP knowledge and traditional uses.

Processing and marketing of NTFP is done mostly by women and leaf plate (*saal patta*) making is an almost exclusively female occupation.³⁴ Making furniture and implements from timber and bamboo (cots, brooms, baskets, mats) are traditionally male vocations. Brewing wine from the flowers of mahua (Indian butter tree) is done by both women and men. Fruits, nuts, mushrooms, medicinal herbs, bamboo, and firewood are harvested for household use and/or sale directly to customers or to traders in the local *haat* (weekly market). Both men and women are involved in marketing. In the market, villagers buy staples like rice, pulses, oil, salt, spices, vegetables, household items, and work tools from their NTFP earnings.

Leaf plate making is the most widespread NTFP activity and profitability varies according to social organization, production technology, and market access. For example, the Self-help Group (SHG, *Mahila Sabha*) comprised of 17 women in the village of Chandna formed their own enterprise independent of the *Grahm Sabha*. They were producing leaf plates manually but with support of BF they invested in an electric pressing machine to increase productivity. By hand they were making 100 plates/hour; one package of 50 hand-made plates sells for R17 (2 packages/hour x R17 = R34/hour).³⁵ With the machine they can make 200 plates/hour; one package of 50 machine-made plates (better quality) sells for R35 (4 packages/hour x R35 = R140/hour). For

³⁴ Almost all the women in Chandna, Dumartari, Mohanpur, Tarobandh, and Salodih are engaged in leaf plate making.

³⁵ Exchange rate on 31 July 2018: 1 U.S. Dollar (USD) = 68.49 Indian Rupee (INR). See: www.exchangerates.org.uk/USD-INR-31_07_2018-exchange-rate-history.html.

machine-made leaf plates both productivity and price are double, representing a 400% increase in revenue potential. The women sell the leaf plates at retail in the Chandna *haat* market and also to traders from other villages who come to purchase in quantity at wholesale. They operate the value chain of their enterprise from harvest of leaves, processing into plates, to local marketing.³⁶

Sericulture is another major NTFP activity but has a much longer and more complex production process and value chain with involvement of many actors.³⁷ *Antheraea mylitta* is a species native to India that produces [Tropical Tasar](#) (Tussar) silk, a kind of wild silk ([Vanya Silk](#)) distinct from that of the domesticated ‘mulberry’ silkworm (*Bombyx mori*). It is considered a NTFP because these silkworms live in native forests tended by tribal peoples. They collect most of the cocoons that provide [Tussar silk](#) for the [Khadi](#) industry, with Jharkhand as India’s leading producer.³⁸ The

³⁶ **Source:** Visit facilitated by Masih Kisku to the Chandna women’s SHG leaf plate enterprise on 31 July 2018. Leaf plates (*pattals*) are made by stitching together *saal patta* (*Shorea robusta*) leaves with tiny sticks. These are wild harvested and crafted by village women in their spare time as a traditional cottage industry. It is customary in India to serve food on *pattals* for guest meals, celebrations, and temple [prasad](#); and Hindu sages have used since ancient times. Widespread use of leaf plates in villages has helped abate the extreme of plastic pollution that plagues the nation. Unfortunately, disposable plastic dishes are starting to replace the handmade *pattals*:

<https://timesofindia.indiatimes.com/city/ranchi/Sal-leaf-dishes-make-way-for-plastic-ones/articleshow/13128420.cms?referral=PM>.

Meanwhile, new companies are taking leaf plate as a ‘new green product’ to global markets. See: <http://leafplate.in>; www.indiatimes.com/news/world/german-company-produces-plates-out-of-fresh-green-leaves-will-ship-them-all-over-the-world-268701.html;

³⁷ Among the key actors are the Government of India’s Ministry of Textiles - Central Silk Board (CSB): <http://csb.gov.in> and the Ministry of Micro, Small and Medium Enterprises - Khadi and Village Industries Commission (KVIC): www.kvic.gov.in. *Khadi* refers to hand-spun and handwoven cloth from natural fibers of cotton, silk, or wool. The fabric is known for its durability, comfort, and capacity to keep people cool in summer and warm in winter. Historically, Khadi is related to the [Swadeshi Movement](#) and India’s struggle for independence. Starting in the 1920s, [Mahatma Gandhi](#) lead the boycott of British manufactured cloth by promoting the spinning of khadi for rural self-employment and national self-reliance.

³⁸ Tropical Tasar silkworms live in native forests in trees belonging to the genus *Terminalia* (e.g., asan, arjun), as well as *saal* (*Shorea robusta*), *jamun* (*Syzygium cumini*), and *ber* (*Zizyphus mauritiana*), among others. Asan and arjun are the principal tree species for tasar sericulture. Arjun (*Terminalia arjuna*) is usually planted and asan (*T. elliptica*) grows in the forest. India’s center for tropical tasar sericulture is the Central Tasar Research and Training Institute: www.ctrtiranchi.co.in. The saree is the premier tasar silk product among many designer garments renowned and exported globally. See: www.utsavpedia.com/textiles/tussar-silk-the-story-of-wild-silk.

PRADAN Sericulture Hatchery in Domdih is an initiative to improve Tropical Tasar sericulture by providing quality seed to producers.³⁹

Another example is the **Khadi Enterprise** of the Badlao Foundation. It integrates the entire value chain by working with producers and directly processes and markets fine hand-woven silk and cotton garments. They have their own mills, retail stores in Mihijam and Ranchi, and also sell via e-commerce. The enterprise is self-sustaining and the entrepreneurs are youth and women with BF providing ideas and technical support.⁴⁰

The **bamboo** *Dendrocalamus strictus* is an important NTFP species used in the villages for making cots, mats, baskets, fences, house framing, furniture, farm tools, and household utensils. Its leaves are utilized as livestock forage and villagers commonly ate the tender bamboo shoots as a vegetable. It is harvested from the forest, without planting or management, for selling to traders in the Chandna *haat* market. Most is sold as raw material at low prices without value added.⁴¹

³⁹ PRADAN works with over 300 farmers to get the seed cocoons that hatch to lay the eggs for reproduction in the hatchery and with over 2000 farmers to acquire cocoons for processing into silk. Farmers with the necessary training can produce the seed cocoons themselves. **Source:** Tour of PRADAN Sericulture Hatchery in Domdih led by its director (Rajesh Choudiary) on 3 August 2018. Professional Assistance for Development Action – PRADAN is a national NGO: www.pradan.net.

⁴⁰ The BF Khadi Mill produces hand spun and handwoven silk and cotton, including both standard and ‘non-violent’ [Ahimsa silk](#). For the standard silk the moths are killed in the cocoon using steam for 15 minutes. Ahimsa cocoons are harvested 10 days later after moths hatch naturally. The price of Ahimsa cocoons (3000 R/ 1280 cocoons) is 25% less than standard cocoons (4000 R/ 1280 cocoons) due to the decrease in fiber length and production cost. One cocoon yields 10 meters of yarn and takes one minute to spin. The women employed in the mill set their own schedule and usually work 4-5 hours/day and may also work on their spinning machines at home. On average, they spin 50 grams/hour or 250 grams/day. Natural dyes from sagwan (*Tectona grandis*) and other leaves are used for dyeing the yarn. Subsequent processes include making thread and mixing colors, weaving into cloth, washing, and finishing, including tailoring of garments, and finally to the BF Khadi Shops for display. **Source:** Tour led by Arvind Ji of BF Khadi Mill (Gandhi Ashram in Kewatjali), Rajwadi Tailoring Center, and Mihijam Shop on 6-7 August 2018.

⁴¹ Common names for this species include ‘Solid Bamboo’, ‘Iron Bamboo’, and ‘Calcutta Bamboo’. It is the most widely distributed and used bamboo in India and is unique for its solid culm; it is the only bamboo that once cured can be nailed without cracking (<http://calcuttabamboopole.com/poles.html>). In the national market it is the preferred species for commercial fishing tackle. Other industrial uses include fencing, concrete reinforcement, light construction, making paper, agricultural implements, musical instruments, and [furniture](#) (<https://mastergardenproducts.com/ironbamboo.htm>). See also: Singhal *et al.*, 2013.

Table 3 typifies the livelihood skills found in most villages in the study area and in which bamboo is one of the most important raw materials.

Table 3. Community Livelihood Skills Register

Livelihood Skills		Villages and Individuals (Initials and Gender)	
		Rajabhita	Bariyarpur
1	Farming	D.K. – G.M. (M)	S.S. – S.B. – U.M. – B.M. (M)
2	Jungle Farming	C.P. (M)	
3	Plowing fields		L.M. (M)
4	Planting rice paddy	S.M. (M)	
5	Grazing cattle		J.T. (M)
6	House construction	S.M. – G.H. (M)	N.M. (M)
7	Blacksmithing	P.M. – K.M. (M)	
8	Making farm implements	P.H. (M)	M.T. – M.T. – L.T. – N.M. (M)
9	Leaf plate making	T.K. – A.M. – A.K. – V.D. (F)	S.H. – M.H. (F)
10	Cot making	M.H. – M.H. (M)	M.S. – J.T. – N.M. (M)
11	Broom making	S.M. (M)	S.H. – H.M. (M)
12	Mat making	V.S. (F)	B.H. – T.H. – J.T. (F)
13	Clay cup making	S.M. (M) – V.S. (F)	
14	Making mahua wine and rice wine		M.M. (M)
15	House cleaning	M.M. – R.S.M. (F)	
16	Clothes stitching	P.D. (F)	
17	Tailoring		H.S. (M)
18	Caring for/ playing with children	S.M. (F)	
19	Making flowers with paper	M.M. (M)	
20	Hunting	S.M. (M)	S.M. (M)
21	Marksmanship (slingshot)	B.M. (M)	
22	Musician on <i>Madhur</i> instrument	D.T. (M)	

Source: Community meetings in Rajabhita (24 July) and Bariyarpur (25 July 2018).

Livelihood skills like blacksmithing and making implements such as cots, brooms, mats, and cups are [rural crafts](#) produced for everyday practical use. Since such skills are readily learned, they are not produced for sale by a specialized [artisan](#) class. Although still common in more remote villages, rural crafts are disappearing with the advance of modernization and youth outmigration.

3.3.2. Critical Livelihood Issues

The FRA is directly related to livelihoods and the potential to resolve the interrelated basic needs of food, water, sanitation, and energy.

Insecure tenure and access to cultivable land and forest resources are fundamental problems for Adivasi livelihoods. According to FRA claims data from BF, the average area of land per household (IFR) is well under one acre (0.4 ha); and the average area per household of access to community land (CFR) is a bit less than 2.5 acres (1 hectare).⁴² IFR and CFR lands are usually not adjacent in the same area and none have irrigation. At the same time, rainfall is becoming more erratic and water tables are dropping. Most families do not have land title and access to their customary forest areas is susceptible to obstruction by FD officials. In sum, the fragmented, un-irrigated and mono-cropped small farm holdings with informal tenure and precarious forest access do not provide a decent livelihood.

⁴² Of 104 acres total from 156 Individual Forest Rights (IFR) claims from 13 villages (out of 35 total) where BF works in Sundarpahari Block, the average IFR claim per household=0.66 acre. Of 3018 acres total from 25 Community Forest Rights (CFR) claims in the same area, the average CFR claim per community=120.7 acres.

In our study area of 12 communities, four have presented both IFR and CFR claims, and five have presented only CFR claims. **The average IFR claim/household=0.53 acre; the average CFR claim/community=110.2 acres; and the average CFR area/household=2.43 acres.**

Village	# individuals / # Households	Average Hh/ Family Size	Average IFR Area (Acres)	CFR Area (Acres)	CFR Area per Household (Acres)
Bara Savaikundi	186 / 34	5.5	0.93	39.10	1.15
Dumartari	183 / 34	5.4	0.10	50.65	1.49
Mohanpur	574 / 106	5.4	0.66	435.24	4.11
Tilaipara	298 / 57	5.2	0.41	71.40	1.25
Bariyarpur	483 / 80	6.0	-	11.11	0.14
Chota Sindri	102 / 20	5.1	-	111.35	5.57
Ghorawali	170 / 28	6.1	-	32.96	1.18
Kusmaha	759 / 126	6.0	-	112.91	0.90
Salodih	116 / 21	5.5	-	127.39	6.07

Source: Calculations from data on Status of FRA Implementation. Badlao Foundation, Domdih, July 2018.

Due to insecure land tenure, **no incentive exists to invest in soil, water, and forest conservation** to improve longer term production. Yet farmers do spend on chemical inputs out of desperation to boost immediate yields. Analogous to drug addiction, use of agrochemicals creates dependency by stimulating current production while aggravating resource degradation and laying a ‘debt trap’ to the *mahajans* (moneylenders) who finance their dependency at usurious rates.⁴³ According to Srivastava and Singh (2012: 67): “With the introduction of HYV seeds, chemical fertilizers, pesticides and single cropping, both tribals and non-tribals have been weaned away from the use of traditional seeds, compost, natural pesticides, and traditional management practices. As a result, soil fertility has gone down.”

Meanwhile, India is afflicted by a pervasive **sanitation crisis** with broken nutrient cycles contaminating landscapes and water bodies, and breeding communicable diseases that directly impact both human and animal health.⁴⁴ The official solution of flush toilets are being installed by government-supported projects in villages already short on drinking water; and risk polluting surface and groundwater, including sources that provide the same villages with their limited potable water. It also wastes the nutrients that need to be safely recycled to recover the fertility of depleted soils and to produce clean energy from biogas.

The **energy crisis** in rural areas centers around cooking fuel and lack of electricity. At national level over 50% of rural households still use firewood for cooking (70% in Jharkhand) and obtaining it is a major cause of deforestation. Impacts fall heaviest on village women who must walk longer distances in search of wood, taking their time and energy away from more productive

⁴³ See: The debt trap of Indian farmers. www.vijayvaani.com/ArticleDisplay.aspx?aid=3495.

⁴⁴ See: Sanitation crisis looms over India – stark reality: www.youtube.com/watch?v=GEAhP4OK0c8.

activities and children left at home. Women are also the most directly exposed to the respiratory and other hazards of the smoke from cooking with firewood. To incentivize people to convert to liquified petroleum gas (LPG), the Indian government's *Pradhan Mantri Ujjwala Yojana Programme* provides a free LPG cookstove and the first cylinder of gas to qualifying low income households. But after the initial cylinder is consumed, people must purchase to replace them. Instead, many sell their stove and cylinder and revert back to firewood since it is less expensive.⁴⁵

The **food crisis** manifests most commonly as food insecurity and malnourishment due to a diet poor in micronutrients (vitamins and minerals) mainly from low consumption of fresh fruits and vegetables. This combined with impaired nutrient absorption because of diarrhea from lack of safe drinking water, hygiene, and sanitation leads to a high rate of childhood stunting and anemia in both women and children. The variety and quality of their diet fell parallel with the adoption of hybrid seeds, agrochemicals, and monoculture farming practices focused on only a few staple grains. This effectively eliminated many traditional vegetables and greens from both farming systems and local diets. At the same time, scarcity of edible forest produce is the result of rampant deforestation, land degradation, and marginalization from subsistence resources. The challenge now is reviving agricultural and dietary diversity to resolve malnutrition in its multiple aspects. To do so, the FRA is essential for the Adivasi to recover secure access to their land and forests (Srivastava and Singh, 2012; Pingali, 2015).⁴⁶

⁴⁵ Although LPG burns much cleaner than firewood, it has serious hazards of its own. For example, in the village of Chota Sindri an accident recently occurred with the explosion of an LPG cooking cylinder that killed nine people in two families. **Source:** Conversation with village leader (J.M.) on the road to Kusmaha, 2 August 2018.

⁴⁶ See also: <https://timesofindia.indiatimes.com/blogs/fresh-reflections/time-to-move-away-from-staple-grain-fundamentalism-to-diversified-diet-system>. For an example of traditional food and cultural practices, see: www.firstpost.com/living/from-leafy-greens-to-meat-how-santhal-food-reflects-the-communitys-identity-intertwined-with-nature-6851821.html.

The **water crisis** is due mainly to deforestation and spread of wastelands from overgrazing and unsustainable farming practices. The region receives ample rainfall but the distribution is sharply bimodal with four months of abundant rain during the monsoon, six months dry, and two months intermediate (see Figure 1). As forest cover shrinks and watersheds are denuded, soils compact and lose their water retention capacity. As a result, less rainwater infiltrates into the ground and increased surface runoff means more soil erosion, crop damage, and flooding during the monsoon. Exposed soils lacking shade also have higher evapotranspiration (i.e., water loss). For these reasons the groundwater table has sunk and many perennial streams, springs, and wells have gone dry. This process is exacerbated by the drilling of thousands of borewells in the region and to massive water withdrawals wherever mining occurs.⁴⁷

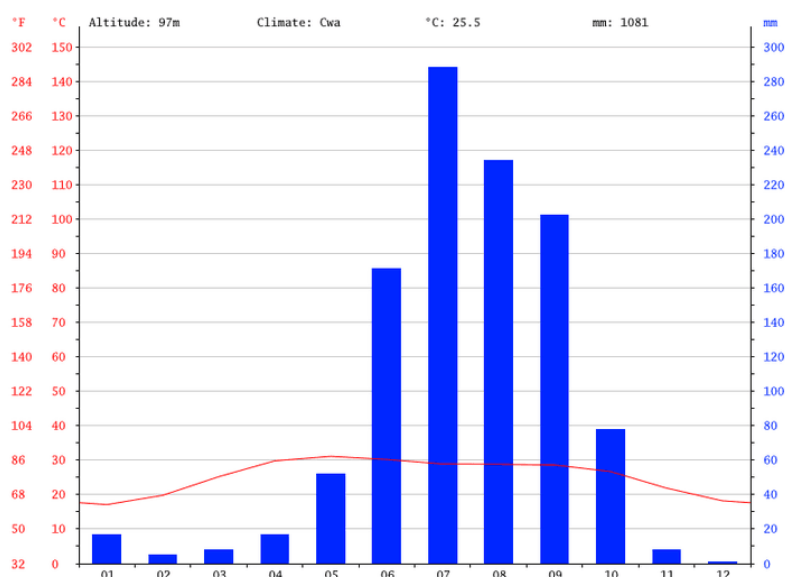


Figure 1. Temperature and precipitation by month – Godda, Jharkhand, India

Godda lies 97m above sea level with a dry-winter humid subtropical (Cwa) climate according to the [Köppen climate classification](https://en.climate-data.org/asia/india/jharkhand/godda-422713). The average annual temperature is 25.5 °C (77.9°F). Average annual rainfall is 1081 mm (42.6 inch). The driest month is December with 1 mm; the wettest is July, averaging 288 mm (11.3 inches).

Source: <https://en.climate-data.org/asia/india/jharkhand/godda-422713>.

⁴⁷ See: www.gaonconnection.com/news-in-english/jharkhand-faces-worse-drought-in-past-couple-of-years-44895?infinite-scroll=1; see minutes 3:39–4:08 addressing the impact of mining on groundwater tables.

3.3.3. Potential Livelihood Opportunities

FRA title provides confidence to invest in water, forest, land, *and* livelihood regeneration without the worry of being evicted as an “encroacher”. The ‘Regenerative Agriculture and Forest-based Livelihood Opportunities’ (RAFLO) concept presented at the end of this paper builds upon existing experiences and resources that are discussed next.

The Krishi Vigyan Kendra (KVK) **Agricultural Science Center** in Godda has long worked with SRI-Rice and Azolla. It is also developing multistory legume and vegetable polycultures, such as: groundnut/ peanut (*Arachis hypogaea*) with pigeon pea/ tur (*Cajanus cajan*); bitter melon (*Momordica charantia*) with elephant foot yam (*Amorphophallus paeoniifolius*) and bottle gourd (*Lagenaria siceraria*). KVK provides extension services to 2000 farm families cultivating these crops in Sundarpahari, in addition to lady finger or okra (*Abelmoschus esculentus*); barbati or yardlong bean (*Vigna unguiculata subsp. Sesquipedalis*), sem (green bean), aloo (potato), brinjal (eggplant), phool gobi (cauliflower), tamatar (tomato), mooli (radish), palak (spinach), amaranth, beetroot, and broccoli; spices such as haldi (turmeric), dhaniya (coriander), lehsun (garlic), sunthi (ginger), pudina (mint), onion, chile; as well as oyster and button mushrooms. KVK also works with tree crops, aquaculture with freshwater prawns, and livestock with improved varieties of chickens (chevro), goats (black Bengal), and pigs (TND jshruk).⁴⁸

⁴⁸ **Source:** Visit to the GVT - Krishi Vigyan Kendra (KVK) Agricultural Science Center at Chakeshari Farm, Godda, Jharkhand guided by its staff of PhD scientists: Ravi Shanker (Director/Pomology), A.P. Thakur (Soils), H.K. Chaurasia (Horticulture), Subi Bhushan (Plant Protection), Satish Kumar (Animal Science), Ritish Kumar (Agricultural Extension), Pragatika Mishra (Home Economics) on 3 August 2018.

Krishi Vigyan Kendra – KVK, Godda (<http://godda.kvk4.in>) was established by GVT in 2006 and is supported by the [Indian Council of Agricultural Research](http://www.icar.org.in) – ICAR (<https://www.icar.org.in>). From its 25-acre research station they demonstrate and disseminate low cost innovative technologies and inputs to improve production and generate employment for marginalized sectors. 80% of their clientele are smallholder farmers in 1640 villages in Godda.

Agriculture may be designed to overlaps with NTFP as productive and regenerative [agroforestry](#) (AF) systems that integrate crops and/or livestock with the conservation and cultivation of trees. Alley or strip intercropping, riparian buffers, living fence, windbreaks and shelterbelts, silvopasture, and forest gardening are among the types of AF systems. These are apt for combining production (food/medicine, fuel, fodder, fiber, timber) with conservation and/or regeneration of ecosystem services, e.g., biodiversity, carbon storage, soil and watershed protection, nutrient cycling, water supply and purification, pollinator and wildlife habitat (Lassoie *et al.*, 2009).⁴⁹ AF systems are particularly suited for agricultural and forest landscape restoration (FAO, 2017).

India has recorded traditions of community agroforestry that date back at least three millennia.⁵⁰ Today, India's **Wasteland Agriculture Development Initiative** (WADI), implemented by NGOs such as BF and Gramin Vikas Trust (GVT), use an agroforestry approach with planting of mixed fruit orchards to restore degraded lands and reduce pressure on intact forests.⁵¹ Orchards consist of fruit trees (e.g., mango, cashew, jackfruit) intercropped with perennial legumes and forestry species planted on boundaries. Species selected depends on suitability and preferences in each locality. The fruit trees start yielding 3-5 years after planting, while the forestry species provide a shelterbelt that helps meet fuel, fodder, and minor timber needs. The area is also intercropped with annual pulses and vegetables in a successional system until fruit trees begin producing.

⁴⁹ See also: Douglas and Hart, 1984; Isbell *et al.*, 2011; Nelson and Coe, 2013; Wilson and Lovell, 2016; Montagnini and Nair, 2018.

⁵⁰ The topic of sustainable agro-forest management appears in Vedic texts ([Aranyakas](#)) from around 1000 B.C. In 2014, India became the world's first country to adopt a [National Agroforestry Policy](#).

⁵¹ WADI is being implemented by NGOs such as BF and GVT (https://gvtindia.org/index.php?p=wadi_details) and has national policy support from the government's Integrated Wasteland Development Programme (IWDP): <https://dolr.gov.in/integrated-wasteland-development-programme>.

The standard **WADI model** used by BF is for each farmer to plant one acre of wasteland to create a mixed plantation made up of 50 mango, 20 guava, 5 lemon, and 200 timber trees = 275 total trees/acre. The GVT system is similar and consists of 40% mango, 30% guava, 30% other fruits such as jackfruit, custard apple, citrus, papaya, and pineapple. Table 4 outlines some of the principal agroforestry (fruit, multipurpose, timber) crops compatible with WADI that have been trialed by the GVT-KVK Agricultural Science Center in Godda. Table 5 lists medicinal and multipurpose plants found on the village forest walks and other species that are locally present and/or have potential for inclusion in agroforestry systems.

[Ayurveda](#), [Siddha](#), and [Unani](#) are ancient systems of medicine widely practiced in India and other parts of Asia. **Ayurveda** means the ‘science of life’ (*ayu* = life, *veda* = science) and has three main branches: *Nara Ayurveda* dealing with humans, *Satva Ayurveda* with animal life, and *Vriksha Ayurveda* with plants. Ayurveda applies a holistic (body/mind/spirit) approach that also includes exercise (e.g., yoga), meditation, adequate sleep, and eating a variety of fruits and vegetables daily. Today it remains as the favored form of health care (both preventive and curative) in India, where a large percentage of the population uses this system exclusively or combined with modern Western medicine. Practitioners operate under the jurisdiction of the Ministry of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH).⁵²

⁵² **AYUSH** - <https://main.ayush.gov.in>, <https://vikaspedia.in/health/ayush>. Ayurveda has a long tradition of over 3000 years and is described in the [Sanskrit](#) texts of [Charaka](#) and [Sushruta Samhitas](#). For recent research on promising **plant medicines** see: Jassim, S. and M. Naji. 2003. Novel antiviral agents: A medicinal plant perspective. J. Applied Microbiol. 95: 412-427. <https://doi.org/10.1046/j.1365-2672.2003.02026.x>. Dhawan, B. 2012. Anti-viral activity of Indian plants. PNAS India 82(1): 209-224. <https://link.springer.com/article/10.1007/s40011-011-0016-7>. Akram, M. *et al.* 2018. Antiviral potential of medicinal plants against HIV, HSV, Influenza, Hepatitis, and Coxsackievirus: A systematic review. Phytother. Res. 32(5):811-822. <https://doi.org/10.1002/ptr.6024>. Dhama, K. *et al.* 2018. Medicinal and therapeutic potential of herbs and plant metabolites/ extracts countering viral pathogens: Current knowledge and future prospects. Curr. Drug. Metab. 19(3): 236-263. www.ncbi.nlm.nih.gov/pubmed/29380697.

Table 4. Promising Agroforestry Crops: Food/Fruit, Multipurpose, and Timber Species

Key Species	Description
Mango – <i>Mangifera indica</i> Amrapali dwarf mango	10-12 varieties incl. Amrapali, Bombay, Insayot, Malica, Malda; rootstock is from hardy local varieties. Mango is normally planted at 10m distance but is only 3m with the Amrapali dwarf variety = higher production per area, better quality (2-3x more beta-Carotene), and easier to harvest. This ‘high density mango’ plantation is intercropped with Subabul.
Guava or Amrood – <i>Psidium guajava</i>	Small fast growing fruit and shade tree. Fruits are eaten fresh, have a good shelf life and are readily sold in local markets, and used to make jam and puree. Also planted in high-density orchard in association with Subabul or Sesbania.
Jackfruit – <i>Artocarpus heterophyllus</i>	Home consumption of fresh raw fruit and for making pickles by adding vinegar, salt, spices; seeds used as vegetables by cooking. Some goes to markets but shelf life is only 2-3 days. Has great potential if processed and linked with markets, e.g., ‘jackfruit chocolate’. See: https://food.ndtv.com/food-drinks/soon-chocolates-to-be-made-from-jackfruit-seeds-1685822 www.thehindu.com/life-and-style/food/ck-narayana-from-indian-institute-of-horticultural-research-gives-jackfruit-a-make-over/article31581990.ece
Custard Apple – <i>Annona squamosa</i>	Delicious fruit but has a short shelf life if not processed; can be used for making sorbet. Not edible during the rainy season due to worm infestation, but is good during the dry season. Recommended to plant in association with leguminous perennials such as pigeon pea.
Tamarind – <i>Tamarindus indica</i>	India is the world’s leading producer and consumer. It is widely used for flavoring curries and rice in south Indian cuisine. Outstanding beverage made from fruit pulp with sugarcane juice and water. Lumber used to make carvings and furniture.
Papaya – <i>Carica papaya</i>	India is also the leading producer. Optimum production is from 0-600 meters elevation. Varieties popular in Jharkhand include Pusa Nanha and Pusa Dwarf for kitchen garden and high density cultivation. Intercropped with mango and guava to produce in first 2-3 years.
Bael or Wood Apple – <i>Aegle marmelos</i>	Aromatic fruit, pulp eaten fresh, made into juice, sorbet, or dried to make powder for recipes. Good price and easy to market as it keeps for 15-20 days without refrigeration.
Coconut palm – <i>Coco nucifera</i>	Cultivation increasing in Bihar with potential in Jharkhand in areas with suitable soils. ‘Tree of life’ with a multitude of food, medicinal, cosmetic, handcraft & industrial products.
Pigeon Pea or Tur, Arhar – <i>Cajanus cajan</i>	Leguminous N-fixing small tree/shrub and among India’s most important pulse crops. Produces in 8 months; ideal in agroforestry including early phases of successional systems.
Subabul – <i>Leucaena leucocephala</i>	Small leguminous nitrogen-fixing tree, excellent green manure and mulch, animal fodder, fuel wood, regenerates vigorously after cutting/pollarding, produces copious seed. Can associate in WADI fruit orchards but must manage properly since it can be invasive. See: www.thebetterindia.com/172164/subabul-tree-fodder-fuel-nitrogen-environment-animals .
Sesbania or Agati – <i>Sesbania grandiflora</i>	Leguminous tree used as green manure for agroforestry intercropping. Its blossoms are edible steamed and to make the traditional Bengali dish called <i>bok phool</i> .
Sagwan or Teak – <i>Tectona grandis</i>	High value native hardwood harvested at 30-35 years. Weather resistant and durable wood used for exterior construction, boat building, furniture, doors, window frames, columns and beams, indoor flooring, countertops, and veneer. Leaves used as a natural dye for silk.
Sisam or Indian Rosewood – <i>Dalbergia sissoo</i>	Fast growing deciduous hardwood ready to harvest in 25 years. The second most important cultivated timber tree (after Sagwan) and Bihar is the largest producer. Among the finest musical instrument, cabinet, flooring, and veneer timbers. Slender twigs used as toothbrush.
Kadam or Kadamba – <i>Neolamarckia cadamba</i>	Large fast growing ornamental tree used for timber, paper, fuelwood, and fruit. Considered a sacred tree associated with Lord Krishna and mentioned in the <i>Bhagavata Purana</i> .
Napier or Elephant Grass – <i>Pennisetum purpureum</i>	Drought-resistant perennial grass excellent for grazing, ‘push-pull’ crop association with maize, soil erosion control and fertility regeneration, windbreak, firebreak, biogas potential.

Source: Visit to Krishi Vigyan Kendra (KVK) Agricultural Science Center, Godda on 3 August 2018.

Note: Mango, guava, jackfruit, custard apple, tamarind, bael, and pigeon pea were also registered in the villages, along with other traditional NTFP species: mahua ([*Madhuca longifolia*](#)), jamun/black plum ([*Syzygium cumini*](#)), ber/ Indian plum ([*Zizyphus mauritiana*](#)), amla/ Indian gooseberry ([*Phyllanthus emblica*](#)), neem ([*Azadirachta indica*](#)), bhelwa nut ([*Semecarpus anacardium*](#)), Palmyra palm ([*Borassus flabellifer*](#)), and saal ([*Shorea robusta*](#)) in Appendix 3. Other fruit trees observed in the area and recommended are banana, plantain ([*Musa sp.*](#)), [*Citrus sp.*](#) (especially orange, lemon, and lime), and pomegranate ([*Punica granatum*](#)). Other species with potential include avocado ([*Persea americana*](#)), carob ([*Ceratonia siliqua*](#)), and vetiver ([*Chrysopogon zizanioides*](#)).

Table 5. Promising Agroforestry Crops: Medicinal and Multipurpose Species

Key Species	References
Amla or Amalaki, Emblic, Indian Gooseberry – Phyllanthus emblica	A main ingredient in both Chayawanprash and Triphala Ayurvedic formulations. -Sharma, R. <i>et al.</i> 2019. Chyawanprash: A traditional Indian bioactive health supplement. Biomolecules 9(5): 161 www.ncbi.nlm.nih.gov/pmc/articles/PMC6571565 . Triphala is made from amla together with Terminalia bellerica and Terminalia chebula . -Petersen, C. <i>et al.</i> 2017. Therapeutic uses of <i>Triphala</i> in Ayurvedic Medicine. J. Altern. Complement. Med. 23(8): 607-614. www.ncbi.nlm.nih.gov/pmc/articles/PMC5567597 .
Jamun or Black Plum – Syzygium cumini	-Ayyanar, M. and P. Subash-Babu. 2012. <i>Syzygium cumini</i> : A review of its phytochemical constituents and traditional uses. Asian Pacific J. Tropical Biomedicine 2(3): 240-246. www.ncbi.nlm.nih.gov/pmc/articles/PMC3609276 .
Neem or Indian Lilac – Azadirachta indica	-Kumar, V. and V. Navaratnam. 2013. Neem (<i>Azadirachta indica</i>): Prehistory to contemporary medicinal uses to humankind. Asian Pacific J. Tropical Biomedicine 3(7): 505-514. www.ncbi.nlm.nih.gov/pmc/articles/PMC3695574 .
Babul or Kikar – Vachellia nilotica (<i>Acacia nilotica</i>)	-Ali, A. <i>et al.</i> 2012. <i>Acacia nilotica</i> : A plant of multipurpose medicinal uses. Journal of Medicinal Plants Research 6(9): 1492-1496. https://academicjournals.org/article/article1380799490_Ali%20et%20al%20%201.pdf .
Bodhi or Pipal – Ficus religiosa	-Singh <i>et al.</i> 2011. Traditional uses, phytochemistry and pharmacology of <i>Ficus religiosa</i> : A review. Journal of Ethnopharmacology 134(3): 565–583. 10.1016/j.jep.2011.01.046 .
Charoli or Chironji – Buchanania lanzan	-Nair, P. 2014. www.valuefood.info/1970/health-benefits-of-chironji-charoli -Singh, S. and A. Singh. 2018. www.fruitipedia.com/2018/11/chironji-buchanania-lanzan .
Chirata – Swertia sp.	-Felter, H. and J. Lloyd. 1898. Chirata. Henriette's Herbal Homepage. www.henriettes-herb.com/eclectic/kings/swertia-chir.html .
Karela or Bitter Melon – Momordica charantia	-Joseph, B. and D. Jini. 2013. Antidiabetic effects of <i>Momordica charantia</i> (bitter melon) and its medicinal potency. Asian Pacific Journal of Tropical Disease 3(2): 93-102. www.ncbi.nlm.nih.gov/pmc/articles/PMC4027280 .
Dhaniya or Coriander – Coriandrum sativum	-Sahib, N. <i>et al.</i> 2013. Coriander (<i>Coriandrum sativum</i> L.): A potential source of high-value components for functional foods and nutraceuticals - A Review. Phytotherapy Research 27(10): 1439-1456. https://pubmed.ncbi.nlm.nih.gov/23281145 .
Haldi or Turmeric – Curcuma longa	-Chattopadhyay, I. <i>et al.</i> 2004. Turmeric and curcumin: Biological actions and medicinal applications. Current Science 87(1): 44-53. http://repository.ias.ac.in/5196/1/306.pdf .
Moringa or Sahjan, Drumstick Tree – Moringa oleifera	-Gopalakrishnan, L. <i>et al.</i> 2016. <i>Moringa oleifera</i> : A review on nutritive importance and its medicinal application. Food Science and Human Wellness 5: 49-56. www.sciencedirect.com/science/article/pii/S2213453016300362 . -Brilhante, R. <i>et al.</i> 2017. Research advances on the multiple uses of <i>Moringa oleifera</i> : A sustainable alternative for socially neglected populations. Asian Pacific J. Trop. Medicine 10(7):621-630. www.sciencedirect.com/science/article/pii/S1995764516307143 .
Tulsi or Holy Basil – Ocimum tenuiflorum	-Pattanayak, P. <i>et al.</i> 2010. <i>Ocimum sanctum</i> Linn. A reservoir plant for therapeutic applications: An overview. Pharmacognosy Reviews 4(7): 95-105. www.ncbi.nlm.nih.gov/pmc/articles/PMC3249909 .
Bacopa or Brahmi, Water Hyssop Bacopa monnieri	-Stough, C. <i>et al.</i> 2015. Mechanisms, efficacy, and safety of <i>Bacopa monnieri</i> (Brahmi) for cognitive and brain enhancement. Evid Based Complement Alternat Med. 717605. www.ncbi.nlm.nih.gov/pmc/articles/PMC4568033 .
Ashwagandha or Indian Ginseng – Withania somnifera	-Narinderpal, K. <i>et al.</i> 2013. J. Botanical Sciences - www.roji.com/open-access/a-review-on-pharmacological-profile-of-withania-somnifera-ashwagandha.php?aid=33844 . www.spicesmedicinalherbs.com/ashwagandha-withania-somnifera.html .
Shikakai “fruit for the hair” – Acacia concinna	Climbing thorny leguminous shrub native to central and south India. Its dried and powdered leaves, bark, and pods rich in saponins have been used for centuries as a natural shampoo, hair conditioner, and body cleanser. Also planted as live fence that, once established, is impenetrable even for elephants. See: www.healthbenefitstimes.com/shikakai .

Source: Forest walks with villagers in July-August 2018 documented in Appendix 3. Rapid Survey of Forest Species and Indigenous Knowledge where amla, jamun, neem, babul, bodhi, charoli, and chirata were found. Karela, dhaniya, and haldi are cultivated locally (KVK visit, 3 Aug. 2018); moringa, tulsi, and bacopa are also present in the area (Varma, Sriwastawa, and Pandey, 1999; Singh, 2008). These together with ashwagandha and shikakai are included as prospective species for integration in agroforestry systems. See also: Dey and Nath De, 2010.

The **Community Health Centre of Sundarpahari** (CHC-S) is within a high-risk area for malaria and dengue and serves an entirely rural (79% tribal) population with low literacy and poor access to safe drinking water, roads and communications. A report published in 2014 by the National Alliance for [Maternal Health](#) and Human Rights (NAMHHR) found that tribal communities are resistant to use CHC-S services because of language barriers and failure to understand or integrate tribal health systems based on local herbs and traditional practices. It recommended the CHC-S should be more flexible and responsive to the felt needs of tribal communities by offering AYUSH and indigenous treatments, as well as allopathic medicine, instead of trying to oblige them to accept medical practices they cannot relate to.⁵³ Since then, the CHC-S has moved in this direction with a new chief medical officer that runs a clean, well equipped and organized center, recently recognized as the top medical facility in Godda District.⁵⁴

Dendrocalamus strictus ('solid bamboo') is the main NTFP bamboo species in the area of this study. This is just one species among India's huge but underutilized **bamboo resources** (over 130 species) with 1300 documented products/uses and enormous potential in national markets. The National Bamboo Mission (NBM), Centre for Bamboo Development (CBD) and the Centre for

⁵³ See: <https://kractivist.org/baer-and-challenges-for-maternal-health-and-nutrition-in-tribal-areas-jharkhand>. Local practices and resources are disregarded and women have been prescribed iron tablets instead of promoting consumption of local iron-rich foods (e.g., *dahl*/pulses, *palak*/spinach, *jamun*/black plum, *bhelwa* and *charoli* nuts). Village herbalists are effective at treating malaria and many other common ailments. Accordingly, "Their local knowledge of herbal medicines and traditional birthing practices have been ignored and eroded by the intrusion of an exclusively allopathic health system that wants them to come to hospitals where no one speaks their language...The PVTGs or particularly vulnerable tribal groups require studies to understand what are acceptable health practices for different tribal groups from the government system and what good health practices exist within their own tribal health systems, which they would like to retain. In addition there should be investigation into their nutritional status, as well as study of local food and agriculture practices." See also: www.ekjutindia.org/docs/PVTGs_Presentation.pdf.

⁵⁴ **Source:** Visit to Community Health Center of Sundarpahari on 25 July 2018.

Indian Bamboo Resource and Technology (CIBART) support new innovations and enterprises that contribute to economic development and landscape restoration based on bamboo.⁵⁵

One of the main NTFP livelihood challenges for the Adivasi is **poor access to markets** and low prices. Before the FRA, all minor and non-timber forest products (especially nationalized products like bamboo and tendu) had to be sold to designated agencies at a price fixed by the state government. Also, the FD controlled NTFP through a system of paid Transit Passes required to transport them out of the forest. Now NTFP harvesting is under community control but the Adivasi lack access to urban markets. The government provides a minimum support price if they cannot obtain a better price in the local *haat* market. However, support prices are nominal and local markets are dominated by traders who buy low (slightly above the support price) and profit through intermediation.

To overcome this, the Ranchi-based CSO *Jharkhand Jangal Bachao Andolan* (JJBA) works to **empower tribals to sell in the cities**. Capitalizing on the urban trend to buy organic products, JJBA is providing institutional support for the formation of Jharkhand's first NTFP marketing cooperative with tribal villages as the shareholders (over 50% of members are women). JJBA

⁵⁵ The **National Bamboo Mission** (NBM) operates under the Ministry of Agriculture and Farmers Welfare to promote a regionally differentiated national strategy to increase bamboo cultivation and marketing (<https://nbm.nic.in>). The **Centre for Bamboo Development** (CBD) of the Indian Plywood Industries Research and Training Institute (IPIRTI) develops bamboo as a substitute material to dwindling wood supplies. CBD/IPIRTI innovations include bamboo laminates, mat boards, corrugated sheets, mat ridge cap for roofing, and pre-fabricated earthquake resistant housing (<http://bamboocomposites.com>). The **Centre for Indian Bamboo Resource and Technology** (CIBART) is India's leading bamboo organization with in-house expertise in development of plantations and all product segments (e.g., craft, flooring, paneling, structures, boats); new technologies for creation of rural jobs through value addition and sales of bamboo products. Their resource to market approach links farmers, harvesters, processors, artisans, and market demand (www.cibart.in). See also: **International Network for Bamboo and Rattan** (INBAR): www.inbar.int/country/india/#1. Examples of new bamboo enterprises and products include Bamboo India: www.bambooindia.com/our-story; bamboo toothbrushes: www.youtube.com/watch?v=g6eQ39M59Ok; Bamboo House India: www.bamboohouseindia.org; Epitome Bamboowood: <http://bamboowood.in>; Bamboo Bicycles: bamboochicycle.com; <https://vawaa.com/artists/vijay-bamboo-bicycle-making-india>.

facilitates market contacts and retail space (currently with two shops in Ranchi) for tribal NTFP (e.g., fruits, roots, herbs), agricultural produce (rice, pulses, spices, honey), and handicrafts.⁵⁶

The JJBA initiative is motivated by successful examples such as the pioneering NTFP cooperative **Aadhimalai** which collects, processes, and markets forest and agriculture produce from the tribal communities of the Nilgiris Biosphere Reserve. It was incubated by and is still associated with the Keystone Foundation (KF), but is now an independent company wholly owned by the communities.⁵⁷ The support by KF made it possible to overcome the challenges faced by most community forest enterprises, e.g., weak organizational capacity, limited business-administration skills, lack of access to finance, difficulty competing with illegal forest products, and absence of markets for lesser-known species (Pagdee *et al.*, 2006).

In regard to artisanal livelihoods from handcraft production, the **Crafts Council of India** (CCI) has affiliates active nearby in the Dumka (neighboring Godda) and Deoghar districts of Jharkhand's Santhal Pargana Division. Areas of support provided by CCI include product design and development, training, exhibitions, trade contacts, sales, and market feedback.⁵⁸

Examples of outstanding **national companies** that include tribal NTFPs in their product lines are as follows:

⁵⁶ **Source:** Interview with Sanjay Basu Mullick (JJBA Executive Secretary) in Ranchi on 8 August 2018. The cooperative is still in early stages since technical and financial support is required until members are ready to take over. As an NGO, JJBA has challenges to obtain resources, operate the stores, and work with multiple products in distinct markets. Packaging is key for product attractiveness and pricing, and shops must carry a wide variety of items to maintain clientele. See also: Lele *et al.*, 2010.

⁵⁷ See: Aadhimalai Pazhanagudiyinar Producer Company Limited (APPCL) – <https://aadhimalai.in/about>; <https://keystone-foundation.org>; www.youtube.com/watch?v=Eg82rG4dQfo.

⁵⁸ See CCI: www.craftscouncilofindia.org; www.craftscouncilofindia.org/indian-crafts-map/jharkhand.

FabIndia is the country's largest private retail platform for clothing and home products made from traditional handcraft processes sourced from rural artisans across India for customers worldwide.

Organic India offers the highest quality certified organic food, herbal, and body care products supporting thousands of farmers and tribal wildcrafters. They apply regenerative agriculture practices to produce whole herbs (not extracts or isolates) in original form.⁵⁹

Examples of **international companies** that include rural producers in their supply chains include the following:

Unilever is one of the world's largest consumer goods companies with over 400 brands. Its **Enhancing Livelihoods Fund** works in partnership with [Oxfam](#) and the [Ford Foundation](#) to improve smallholder livelihoods while securing their supply chain. [Hindustan Unilever](#) is the subsidiary in India recognized for its sustainability initiatives and has its own charitable foundation operating the 'Water for Public Good' program.⁶⁰

Livelihoods Funds are supported by private companies to make their supply chains more sustainable while improving the livelihoods of smallholder farmers. In India it works with the Naandi Foundation and Adivasi communities on the Araku organic coffee agroforestry project.⁶¹

⁵⁹ See FabIndia: www.fabindia.com. Organic India: www.organicindia.com; www.organicindia.com/regenerative-agriculture; www.organicindia.com/whole-herb.

⁶⁰ See: www.unilever.com; www.unilever.com/news/news-and-features/Feature-article/2015/boosting-smallholders-livelihoods-strengthening-our-supply-chain.html; www.hul.co.in; www.hul.co.in/sustainable-living; www.huf.co.in.

⁶¹ See: <https://livelihoods.eu>; www.livelihoods.eu/projects/naandi-india.

3.3.4. Livelihood Constraints and Migration Pressures

Villagers are uninformed of the potential opportunities described and/or lack the means to carry them out. Despite the diversity of their agricultural/NTFP activities, **future livelihood prospects** for children and youth in the Adivasi villages we visited are considered bleak according to parents interviewed. Here is an excerpt from our first discussion in the village of Bara Savaikundi:

You have beautiful children. What kind of future would you like them to have as adults?

We want them to go find employment because they will not be able to make a living in the village.

What if your children could make a good living here in the village?

If they could have a good livelihood here we would wish for them to stay.

Similar responses were received, almost unanimously, to the same questions made in each village.

On our second visit to the same village, individual forest rights (IFR) holders (31 families) proposed converting IFR forest land to agricultural use and requesting government permission to do so. **Why do you want to change your forest to agricultural land?**

We need more land for farming to produce enough food for our families.

Can you increase production on your existing farmland?

We can't since we don't have irrigation water. When we don't get enough rain we cannot plant or our harvest is poor and then we are forced to migrate. If we had everything we need here in the village then we would not need to go out in search of work.⁶²

⁶² **Source:** Focus Group Discussions (FGD) in Bara Savaikundi (16 and 20 July) and Kusmaha (19 July 2018).

Migration is already a trend of the majority. The **male youth** we interviewed all had experience with seasonal migration. They usually leave to work for 4-6 months during the dry season, but sometimes will stay for a year or two when needed to provide enough income for their families. Work is typically on low paid agricultural labor, brick kiln, building or road construction jobs, or whatever they can find, sometimes ending up in [megacities](#) such as [Kolkata](#), [Delhi](#), or [Mumbai](#). When asked if they like to migrate, almost all said they prefer farming and do not leave home if the harvest is good. When they do migrate, most return in 4-5 months. Most villagers surveyed do not consider this a problem since migrants make essential contributions to the household economy through remittances and generally maintain respect for village norms and culture on their return.⁶³

A newer tendency is for **female youth** to also migrate to urban areas, a change from earlier patterns of predominantly male migration. Poverty is driving tribal families to send unmarried daughters to cities in search of work and many find employment as maids for upper or middle-class families. Tribal girls are in high demand because “they don’t revolt” and are thus particularly prone to abuse. Most are paid the bare minimum, but their families also depend on their earnings to survive. Such migration is interwoven with the growing structural problem of [human trafficking in India](#).⁶⁴

Paharia villages occupy the most marginal areas with the lowest income, literacy, and health status with roughly half of children malnourished (Lal *et al.*, 2012). The Paharias are a hill tribe that base their livelihood on shifting cultivation, gathering of NTFP, hunting-fishing, and basket-

⁶³ **Source:** FGD with *Grahm Sabha* and youth from the villages of Tilaipara (16 July), Chota Sindri, Ghorawali (17 July), Salodih (17, 26 July), Dumartari, Tarobandh (31 July), Gardih, Kusmaha (2 August 2018). See also: <https://www.sabrangindia.in/article/migration-waves-ativasis-forced-out-homelands>.

⁶⁴ **Source:** Interview with Sapna Surin (Programme Coordinator, Oxfam India-Jharkhand), Ranchi, 9 August 2018. Sapna is from the [Munda](#) tribe and conducted research with TISS on reproductive issues of young tribal women.

making.⁶⁵ Since the 1980s dependence on hunting-fishing declined with enforcement of the Wildlife Protection Act (1972) and Forest Conservation Act (1980), and agriculture became more important. However, farmland is scarce and shifting cultivation is progressively degrading the forest as recovery times between cropping cycles diminish. Soil fertility, water tables, and crop yields are dropping and most families can grow only half the amount needed to feed themselves, often resulting in hunger and malnutrition. Men are frequently obliged to migrate -sometimes indefinitely- to take jobs as day laborers, leaving wife and children behind. Drought in recent years has heightened both the need to migrate and the incidence of [child trafficking](#) and slavery.⁶⁶

Ongoing deforestation imperils the NTFP livelihoods of the Paharia and the Santhal. They are moving from independent subsistence ways of life to dependence on market foods and medicines, agrochemicals, moneylenders, migration, and government assistance. Some families receive support from the [Antyodaya Anna Yojana](#) (AAY) subsidized grain program for the poorest households. In 2005, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) was established to provide at least 100 days/year of work, intended as a labor and social security measure against hunger.⁶⁷ However, to receive such benefits an [Aadhaar](#) identification card is needed but are usually not accessible in tribal areas. The Johar Project of the Badlao Foundation works with the women of tribal villages through participatory planning to become aware of their rights and take organized action to access such government services.⁶⁸

⁶⁵ The Paharia are listed by the Ministry of Tribal Affairs as a 'Particularly Vulnerable Tribal Group (PVTG)': <https://tribal.nic.in/pvtg.aspx>. The three main groups of Paharia according to geographical location and cultural or linguistic differences are [Sauria Paharia](#) and Kumarbhag Paharia in the northeast (Rajmahal Hills) and [Mal Paharia](#) in the southeast of Santhal Pargana.

⁶⁶ See: Tudu and Michael, 2018. Also: www.gaonconnection.com/read/paharia-tribe-in-jharkhand-struggling-poverty-malnutrition-and-human-trafficking-46712?infinitemscroll=1; www.freedomunited.org/news/indias-child-trafficking-trade-revealed; www.globallaveryindex.org/2018/findings/country-studies/india.

⁶⁷ MGNREGA: www.nrega.nic.in. The complex payment procedure makes many villagers averse to participating.

⁶⁸ **Source:** Interview with Krishna Jee (Johar Project Coordinator), Badlao Foundation at Domdih, 18 July 2018.

3.4. Observations from Village Visits

Of all the villages we visited, **Rajabhita** is the most remote because it lacks road access. The following observations are from our two-hour walk to arrive there from road's end in the neighboring village of Dumartari.

(1) The village of Rajabhita has a designated **sacred forest** ([*Sarna sthal*](#)) area of about four hectares (10 acres) surrounded by a rock wall to demarcate and protect it from hunting, grazing, and tree cutting, which are strictly forbidden. The villager who accompanied us explained that everyone from Rajabhita and neighboring villages (Dumartari, Maspara) respects this area.⁶⁹ In addition to being a place of spiritual significance, they understand the importance of the forest for generating pure air, water, and soil fertility; regulating temperature and moisture; sheltering from weather extremes; providing a home for wild animals; and as a place of refuge for contemplation. He also said: *We are the best people for protecting the forest and should be the ones getting paid as forest rangers. We would protect the forest and wildlife much better than the Forest Department.*⁷⁰

(2) Shifting 'slash and burn' cultivation (*Khallu*) or '**jungle farming**' is practiced. The procedure is to cut and burn the understory vegetation and plant crops (e.g., maize, beans, millets, pigeon

⁶⁹ This is an example of a [Sacred grove of India](#), a community-protected forest area of religious significance. See: Ormsby and Bhagwat, 2010; Ormsby, 2011. The concept of 'sacred forest' originated in Adivasi societies and is described in Vedic texts such as the [Aranyakas](#) ('forest works'), [Smritis](#), and [Upanishads](#). 'Participatory forest management' was common in ancient India with village committees responsible for forest stewardship. Ideas around sacred groves, corridors, and many ethnoforestry practices evolved further with the economic advance of agriculture in the late Vedic period between 1000–500 BC (Kumar, 2008).

⁷⁰ Among the villagers, Forest Department officers have a reputation for being arbitrary and corrupt. This article illustrates why: www.telegraphindia.com/states/jharkhand/wild-abode-minus-wildlife/cid/1428220.

pea), and then cut the overstory for the crops to grow in open sunlight. The same spot is cultivated for a year or two and then left for 3-4 years to regenerate (as compared to 10-12 years in the past). Large areas across most of the watershed have been cut, including on steep slopes, and are now in various stages of cultivation or regrowth. However, the soils are eroding, crop harvests are in decline, and the forest does not recover as it used to. The villagers are very aware of this. Our guide commented: *The only way to save the next generation is to save the forest.*

(3) Midway on the walk the path transitioned abruptly into a wide track that continued to a bridge where it ended. An MP (Member of Parliament) **road and bridge construction project** initiated in 2006 was abandoned before completing the connection between the three villages (Dumartari, Rajabhita, Maspara). The road is poorly designed, disregarding the steep and undulating topography, and lacks drainage channels. This has caused severe cumulative damage (gully erosion, stream sedimentation) to the watershed and the road itself, remaining as an open and deepening wound on the landscape. The villagers are despondent with this outcome but have no means to seek redress.⁷¹

On the other side of the bridge, the road reverts back to a footpath leading to **Rajabhita**. The wide dirt lane through the village lacks drainage and accumulates rainwater in large puddles. The villagers gathered for the meeting, coming from their fields or homes of earth and thatch. We conversed about their skills and assets, problems and needs, and future aspirations.

⁷¹ Unfortunately, this sort of experience is common. Betka described about the corruption of government officials who channel such projects, take kickbacks, allow contractors to do shoddy work with no oversight, control, or responsibility for incomplete or defective results.

The **priority needs** expressed by the people of Rajabhita were:

- A water pump to supply water for domestic use. Now they are bringing water from the river.
- Completion of the road. Lack of road access is especially problematic when there is a medical emergency. Also, without the road they cannot access government programs such as housing, day care, and scholarships for their children to attend middle school and high school.
- Dam and a pump to provide water for irrigation. Lack thereof is the main limitation for farming.
- Responsible local school teachers. Two teachers with 25 students attend their village school. The problem was that teachers put older and younger students in the same class and used identical content and methods with all. The older children stopped attending because they weren't learning. Some had been in school for five years without learning to read or write. The school was a disgrace but now has a new local teacher and it is starting to improve.

The following day (25 July) we visited **Bariyarpur**, a Santhal village new to the FRA process. Most people are farmers without irrigation and dependent on rainfall. While last year was a good harvest, this year the rains came too little and too late, thus more people will need to migrate to find work outside the village. Other livelihood activities include leaf-plate making, handcrafts, and selling goats and chickens in the market. They do not have large trees or forest areas and thus have little relation with the Forest Department. But they do have a community forest area and some villagers have individual land titles. The forest is important for firewood, leaves, mushrooms, medicine, grazing for animals, and building materials such as bamboo, timber, thatch, and stones. Their aspiration for their children is to *send them to high school so they can get a good job and have a bright future.*

All of the villages visited during this study shared in the hope of education as the key to a better life for their children.⁷² The **Upgraded Middle School Mohanpur** is a good example of an effective public school where children are learning and both they and their parents are content. Unfortunately, this is the exception rather than the norm. Of the 160 public primary schools that serve the 298 villages of Sundarpahari Block, only 10-15% are considered ‘good’, such as in Mohanpur.⁷³ All public schools have the same infrastructure and facilities; schools along main roads are well maintained, but not the more distant schools. However, school quality depends mainly on the teachers. This has improved in recent years as now more teachers are of tribal origin and fit better into the community. The student-teacher ratio is one of the main problems since public schools cannot provide enough teachers due to budget constraints.⁷⁴

The Christian mission schools are private charitable institutions and are considered the best schools in the region. Most operate from kindergarten to high school (12th grade) and provide their students with a midday meal, books, and a stipend. A new non-denominational charitable initiative of the Badlao Foundation is the **Pahal Residential High School** at Domdih, an outcome of nearly four decades of work in Santhal Pargana. It has space for 100 students with the residence hall upstairs and classrooms downstairs in its newly constructed building. Students will be selected from families living below the poverty line with preference to tribal peoples.⁷⁵

⁷² For example, in Ghorawali (17 July 2018) the villagers mentioned that since their children have learned to read and write it's easier for them to get jobs in the city.

⁷³ The more common situation is the example cited above of the school in Rajabhita.

⁷⁴ **Source:** Visit to the Upgraded Middle School Mohanpur on 1 August 2018. Primary school is from 1st to 5th grade, middle school is from 6th to 8th grade, and high school is from 9th to 12th grade.

⁷⁵ **Source:** Interview with Badlao Foundation staff (Arvind Ji, Rajesh Yadav, Krishna Jee) on day of inauguration of the Pahal Residential High School on 22 July 2018.

3.5. Gender Equity Issues

An understanding of gender relations and how they influence the family and community is necessary to address livelihood issues and FRA implementation. The **status of tribal women** is complex (see Tables 6 and 7). Although they are allowed to work outside home and are more mobile than their Hindu counterparts, their position is subordinate to that of men. According to Srivastava and Singh (2012), most tribal women marry in their early teens and have their first child before the age of twenty; they are prohibited from participating in community governance; and wife beating was common.

BF established its operations in Santhal Pargana in the 1980's after seeing the plight of Paharia tribal villages living in [debt bondage](#) and particularly its impacts on women and children. The BF strategy is to empower women's Self-help Groups (SHG, ***Mahila Sabha***) to address income generation and livelihood needs, access social services, and overcome domestic problems such as male alcoholism, wife beating, and desertion.⁷⁶ In the last two decades domestic violence has declined dramatically due to education, more outside cultural exposure, and the activities of the women's *Mahila Sabha*.⁷⁷

⁷⁶ *Mahila Sabha* is a meeting of village women that traditionally takes place before the *Grahm Sabha*. The BF focus on the *Mahila Sabha* fits with the Ministry of Rural Development *Deendayal Antyodaya Yojana* National Rural Livelihood Mission (NRLM) that supports women's Self-help Groups (SHG) to develop enterprises and improve access to financial services. See: <https://aajeevika.gov.in>.

⁷⁷ As an example, a SHG member recently had a crisis with her husband drinking and beating her. After she disclosed this to the group, the women of the SHG banded together to shame and threaten the offender. This was very effective and the abuse stopped. Another issue about 15 years ago was the violence against women being accused as witches. In addition to local action, this was halted mainly by a national public education campaign backed by the government. **Source:** Focus Group Discussion with women's Self-help Groups in Mohanpur, 1 August 2018.

Table 6 places the status of tribal gender relations in context by contrasting with the general situation of the majority Hindu rural population at national level.

Table 6. Gender Relations and Land Rights in Hindu and Tribal Societies

Social Norm	Society	
	Hindu	Tribal (Paharia, Santhal)
Gender roles	Women work in the homes, not in the fields. Men hold the family leadership role.	Women and girls are the backbone of society: they have the leadership role for family/household management, planting, harvesting and marketing of crops, NTFP, and handicrafts. Role of men is mainly heavy labor (e.g., plowing), artisanry, construction, herding livestock, hunting.
Gender preference	Prefer the birth of boys because for girls they must pay dowry when they marry. This tradition is now less common but still exists in many rural villages.	All tribals respect the girl child. Tribal cultures have a “reverse dowry” system and there is equal or greater preference for baby girls. The girls’ family is the one to receive gifts at marriage.
Courtship and marriage	Marriages are arranged by the parents. The bride and groom must be of the same caste and religion. If not, they will be shunned by their family and community; traditionally, violation of this norm may even result in the death penalty. After marriage girls go to live with the boy’s family. Divorce or separation is looked down on but is now legally permitted via court proceedings.	The girls can choose who they want to marry. Girls are more free to socialize outside of their home (in this regard, more similar to modern Western culture). In the Paharia custom, brides and bridegrooms’ families visit each other and the potential couple will stay together for a time as a trial to see if they are suited to get married later. After marriage, boys may go to live with the girls’ family if approved by the families and the village. Couples are not considered truly married until they have children. There are no proceedings for divorce or separation, just desertion by the men which is easy for them to do since women have no property rights.
Caste system	The broad categories of caste (<i>Varna</i>) are: Brahmins – priests, scholars; Chitrayas – rulers, warriors; Visayas – farmers, merchants, artisans; Shudras – servants, workmen; Dalit – ‘untouchables’.	Also have castes but untouchability has been eradicated; and marriage between castes is allowed so long as the couple do not have the same surname. (e.g., the 9 Santhali surnames correspond to the following castes: Brahmins→ Murmu Chitrayas→ Soren, Kisku Visayas→ Besra, Hansda, Hembrom Shudras→ Baski, Marandi, Tudu).
Land rights	Traditionally, land rights were held exclusively by men but this has gradually changed. At national level, women may now legally inherit land and may be entitled to land from their husband in cases of divorce or separation.	The Paharia have mostly community land rights and also have the custom of sharing income with relatives. Individual land rights (ILR) for both Paharia and Santhal are held only by male heads of household. Women cannot hold ILR and even if they are deserted by their husband, they still have no land claim. If the male head of household dies, the land will pass to the eldest male child (regardless of age) or the nearest male relative (e.g., brother). Reason: the village would lose the land if women had land rights and married a non-tribal.

Source: Interview with Asha Rathore and Bajrang Singh (Badlao Foundation leaders) at Green Wood Public School in Mihijam on 6 August 2018.

By contrast to rural Hindu society, tribal peoples have a ‘reverse dowry’ and have equal or greater preference for the birth of females. However, tribal women have a different problem: they have no **rights to land**. Jharkhand has 32 tribes and in none do women have property rights. For years, the *Mahila Sabha* women’s groups with support of BF have been advocating for reform. Although most older men are opposed to change of the status quo, younger men with more education and national experience tend to be supportive.

Table 7 is the survey results from a group of village women with a higher than average level of education and exposure outside their villages.

Table 7. Gender Equity Survey of Female Rural Social Workers

Questions		Summarized Replies
1.	Do young women feel safe and respected in your village and region?	Although the answer was “Yes” in terms of personal security, the problem expressed by 90% is the lack of proper access to emergency health care. Most live over 50 kilometers from the nearest doctor, clinic, or hospital and they do not have access to ambulance service. In case of a medical emergency, they are likely to die before arriving at a hospital or clinic. The other main concern is the lack of proper employment for women in the villages or towns nearby.
2.	Do young women have freedom to decide their own marriage choices?	The majority (15 of 24) said “Yes” because they are from Scheduled Tribes (2 Paharia and 13 Santhal). In Adivasi cultures, the boys’ family pays dowry and the girls’ family receives.
3.	Do you feel that relations between wife and husband are fair and equitable?	The majority feel that the norms of Indian national society are relatively fair and slowly moving toward greater equity. However, in the household they still have to take orders from their husbands: “...it seems the men still want to dominate over us.”
4.	Do you feel that women are accorded due respect and consideration in society?	Males definitely get the most respect in society. Boys also get priority because they will be the ones in charge of caring for the parents in their elder years.
5.	If you could make changes to gender relations, what would they be?	More equal and better education opportunities for girls at village level. Boys get more education. Since girls usually get married and go to live with the boy’s family, the common idea is that education for them is not important.

Source: Participants of the ICDS *Anganwadi Sevika* Job Training Course (2 Aug.–2 Sept. 2018, Trainer: Sangeeta Hansda) of female social workers (*sevika*) for rural childcare centers (*anganwadi*) of the Integrated Child Development Service (ICDS) of India’s Ministry of Women and Child Development. Survey on 7 August 2018 at B.F.’s Gandhi Ashram Training Center.

Profile: Of 24 total participants, 15 are from Scheduled Tribes-ST (2 Paharia, 13 Santhal), 7 from Other Backward Class (OBC), 1 from Scheduled Caste (SC), and 1 as “other”. (*Anganwadi Sevika* gives training/hiring preference to ST and SC). Occupations: agriculture (21) and housewife (3). Educational levels: primary (9), intermediate (9), high school graduate (5).

One of the main advances for gender equity in the last decade is in the political sphere. Now women engage actively in the *Grahm Sabha* due to national rules established since 2012 requiring 50% female representation. This is a long-time demand from women at national level. At local government level, actual women's representation is between 30-50%.⁷⁸ The top priority of survey participants was greater equality and opportunity of **education for girls**. Interestingly, this is also considered among the top solutions by 'the most comprehensive plan ever proposed to reverse global warming' (Hawken, 2017).⁷⁹

Currently, where tribal women suffer the most is in the daily **struggle for family sustenance**. They are responsible for gathering water, fodder, and firewood. Due to deforestation and land degradation they must walk greater distances to obtain them, wasting time and energy they could have devoted to more remunerative work, supporting their children, and minding their own health (e.g., most women experience moderate to severe anemia). This burden also impacts girl children who are kept at home, discouraged from attending school, to look after the younger children and do household chores while their parents are away. Since male household members are often absent due to migration, women must also take on a greater workload both at home and in required village activities. During drought periods these problems intensify, bringing the specter of hunger and malnutrition that first affects women and children (Mitra, 2008).

⁷⁸ **Source:** Interview with Asha Rathore and Bajrang Singh (Badlao Foundation leaders) at Green Wood Public School in Mihijam on 6 August 2018.

⁷⁹ See: www.drawdown.org/sectors/health-and-education.

3.6. Community-based Natural Resource Governance and the FRA

Decentralized NR governance is essential for the implementation of the FRA and to assure the sustainability of village livelihoods. The *Grahm Sabha* and their Community Forest Resource Management Committees (CFRMC) are designated to lead this process. Table 8 on the next page presents the NR norms compiled from the participants of this study.

The following are participant responses related to NR governance and implementation of the FRA.

What are current problems you face in regard to the Forest Rights Act?

- *The Forest Department (FD) makes boundaries that encroach on our land or deny access to our parcels in FD areas. Then we are subject to fines or confiscation of crops by the FD. If they continue to refuse us access to our land then it will lead to violence. After one incident we all went together from the villages and did a protest at the FD Office. Afterward, they acceded to our demands due to fear of reprisals.*
- *Twenty-six villages out of 35 have their Community Forest Rights applications approved but we have not received the documentation to confirm it. This was supposedly approved between 2013-2017 but we were not informed or given a copy. Badlao Foundation found out in 2017 and had to file a right to information request to get access.*
- *People from other villages come to our forest to cut trees and harvest leaves for making leaf plates. We want to prevent them from doing this.*

What are your aspirations for the future?

We want to get our FRA documentation to secure our land rights. This will allow us to improve our land to cultivate more crops and have a better livelihood and future for our children. The forest is also very important to us for food, Ayurvedic medicine, and materials like bamboo.

Are villages managing their forest sustainably now?

*As they are being managed now, the forests are declining and eventually will be gone. All villagers have right of access to the community forest but there is no system in place to ensure it is used sustainably. In most villages people feel free to take forest resources from community land and the question is: **How may we control that they do not take too much?***

Table 8. Existing and Proposed Norms of Natural Resource Governance

Rules/ Regulations and Proposals for Natural Resource Use and Management in the Villages		
Traditional/Existing		Proposed/Recommended
<ul style="list-style-type: none"> • Permission must be requested to and granted by the <i>Grahm Sabha</i> to cut trees from the community forest. • Permission from <i>Grahm Sabha</i> is restricted to providing for subsistence needs of village members, not for selling outside. • People from outside the village are not allowed to harvest from the community forest (Rajabhita). • No firewood/ tree cutting or grazing is allowed in the Sacred Forest area (Rajabhita, Salodih). • Cutting of young trees is prohibited; firewood should be gathered only from dead or dying trees. • Collecting of leaves for leaf plate is only what's needed and within the capacity of the trees to support. • Hunting of animals like tigers and bears is prohibited. • Surplus land between properties belongs to the community and cannot be appropriated by neighboring individual landholders. • Trees on border between uphill and downhill neighbors belong to the former, responsible to prevent water damage to neighbor below. 		<ul style="list-style-type: none"> • Prohibit farming in the community forest; cultivation allowed only on individual or family holdings. • Prohibit lighting of fires in the forest. • Prohibit grazing in bamboo cultivation areas. • Place signs with village CFR rules and regulations in a visible location for community and outsiders to see. Register these regulations with the local government. • Form a community forest ranger group to protect the forest and enforce the rules/regulations. • Make a plan and work together to improve the health of the forest (e.g., planting trees).
Systems/ Mechanisms for		
Forest Protection	Benefit Sharing	Conflict Resolution
<ul style="list-style-type: none"> • Rock wall and signs in certain places, especially around the Sacred Forest area (Rajabhita). Fines are imposed on violators. • To avoid forest fires the dried leaves under mahua trees are accumulated and then burnt in a safe place instead of burning under the tree canopy. • Current proposal to collect 5 rupees/ month/ family to help cover forest management costs. 	<ul style="list-style-type: none"> • Individual landowners are the only persons eligible to keep the produce grown on their land. • One exception to the above are 'traditional use rights' of persons who had previously planted trees on the site that are respected. • Produce from community lands may be shared among people who don't have land. • Current system of responsibility and benefit sharing is inadequate and is leading to forest depletion. 	<ul style="list-style-type: none"> • Small conflicts are resolved at the level of <i>Grahm Sabha</i> or with selected people from nearby villages who are called for this purpose. • Larger intercommunal conflicts are resolved at <i>Panchayat</i> meetings. • Parties judged in the wrong must pay a fine and all parties respect the outcome.
Training/ Capacity Building and Resource Needs for		
<i>Grahm Sabha</i> and FRC Members	BF Community Mobilizers and CFRMC Members	
<ul style="list-style-type: none"> • More information and training about tribal rights and the Forest Rights Act. • Completion, maintenance, and management of individual and community forest rights application forms and processes. 	<ul style="list-style-type: none"> • Participatory definition and community-based enforcement of norms. • Formulation and implementation of the Community-based Forest Conservation and Management Plan (CFCMP). • Training and proper compensation of the CFRMC and forest rangers for both village outreach/education and NR governance/protection activities. • Villagers should be paid for planting trees and these should be mostly fruit trees to lower likelihood of being cut. 	

Source: Focus Group Discussions with *Grahm Sabha*, FRC and CFRMC members from the villages of Chandraidih, Bariyarpur, Kusmaha, Sagar, and Kusumghati in FRA Camp at Sidhu Kanhu Ashram of BF at Domdih on 21 and 27 July; villages of Gardih (23 July), Rajabhita (24 July), Bariyarpur (25 July); and with BF Community Mobilizers at Domdih on 4 August 2018.

The big trees are already gone from most community lands. People control on their own (IFR) land; but on community (CFR) land the rules and enforcement are weak. In a few communities, where there is good governance, they still have big trees. We need to visit them to learn how they do it. The Paharia people used to do shifting cultivation in the forest but now, in the places where they have stopped, the forest is starting to recover. Since villagers are accustomed to take what they want from the forest, if they were informed of new rules that define limits and require permission, most would object. But if there was an arrangement for them to have paid work as forest caretakers and tree planters, rotated within the community, they would be in agreement.⁸⁰

Youth capacity development is another key issue for implementing the FRA. Concern exists about long-term sustainability due to the low degree of youth participation in the *Grahm Sabha*. Adults have not adequately recognized the importance of including youth in the FRA and other village governance processes.

Opportunities for youth to engage in the *Grahm Sabha* in ways that are active and creative, without too much time sitting in meetings, are needed. They should be included in the CFRM and other committees or teams to address issues such as forest protection, new initiatives, and gender equity. Although it will take time, their contribution will grow as they gain experience, and is an essential process to cultivate leaders for the future.

CSOs have a similar challenge to find second-line **leadership qualified for organizational work** while maintaining their tribal roots and identity. Tribal youth moving from country to city to pursue advanced studies often struggle and need guidance to succeed. CSOs, businesses, and government agencies can provide such support by linking them with relevant opportunities and networks.⁸¹

⁸⁰ Currently local wages for labor are between R150 – 200/day. The Forest Dept. pays R168/day for tree planting.

⁸¹ **Source:** Interview with Sapna Surin (Programme Coordinator, Oxfam India-Jharkhand), Ranchi, 9 August 2018.

The **Badlao Institute of Training and Management** (BITM) in Ranchi was created to help address the needs mentioned above by developing skilled grassroots development professionals and empowering people for social reform.⁸² The FRA Workshop with field mobilizers and village youth that was held at the BITM on 8-9 August 2018 (BF-OIN Project) is an example of the kind of practical training villagers have requested to enable them to implement the Forest Rights Act.

Community Forest Rights (CFR) grants communities the right to “manage, protect and conserve” (FRA, 2006), providing greater security of tenure and management authority compared with prior [Joint Forest Management](#) (JFM) where forests were given on lease in co-management with the Forest Department (Cronkleton *et al.*, 2012; Murali *et al.*, 2003). CFR provides a greater impetus for community investment of time, labor, and resources to protect and manage their forest.

Applicable to CFR, Ostrom (1990) defined eight key principles for the design of effective [community forestry](#) and similar natural resources organizations, outlined below.

1) Clearly defined boundaries- Individuals or households with rights to withdraw resource units from the common-pool resource and the boundaries of the common-pool resource itself are clearly defined.

2) Congruence- a. The distribution of benefits from appropriation rules is roughly proportional to costs imposed by provision rules; b. Appropriation rules restricting time, place, technology and/or quantity of resource units are related to local conditions.

⁸² Badlao Institute of Training and Management: <http://bitm.net.in>.

3) Collective-choice arrangements- Most individuals affected by operational rules can participate in modifying operational rules.

4) Monitoring- Monitors, who actively audit common-pool resource conditions and user behavior, are accountable to the users and/or are the users themselves.

5) Graduated sanctions- Users who violate operational rules are likely to receive graduated sanctions (depending on the seriousness and context of the offense) from other users, from officials accountable to these users, or from both.

6) Conflict-resolution mechanisms- Users and their officials have rapid access to low-cost, local arenas to resolve conflict among users or between users and officials.

7) Minimal recognition of rights to organize- The rights of users to devise their own institutions are not challenged by external governmental authorities.

8) Nested enterprises (for common-pool resources that are part of larger systems)- Appropriation, provision, monitoring, enforcement, conflict resolution and governance are organized in multiple layers of nested enterprises.⁸³

3.7. Participatory Rural Appraisal

This section presents the results and analysis of the PRA exercises with villagers, BF mobilizers who work closely with them, and BF staff both in the study area and in the head office in Mihijam.

3.7.1. Situation of Communities

Table 9 synthesizes the current situation of the communities as analyzed by their own members.

⁸³ **Source:** Adapted from Ostrom (1990: 90) Eight Design Principles Illustrated by Long-enduring Common-pool Resource Institutions. See also: Agrawal and Ostrom, 2001; Marshall, 2008; Pagdee *et al.*, 2006.

Table 9. Strengths, Weaknesses, Opportunities, and Threats-SWOT Analysis of Villages with Community Members

Strengths	Weaknesses
<ul style="list-style-type: none"> • People know and respect each other in the village. • Unity among people in the village. Helping each other in case of need or emergency; joining together in case of outside menace. • Own language, culture, territory. • Live in peace connected to the land. • Openness and freedom to speaking their ideas. • Diverse skills in the village. • Teach their children about work, culture, Ayurvedic medicine, etc. • Custom of marriage only within their tribe, not to outside cultures or castes (Dumartari). 	<ul style="list-style-type: none"> • Some people drink too much alcohol and this causes family problems. • Envy, not helping each other, trying to bring people down when they start to succeed. • Some people are lazy, don't work hard for their family. • Some do not share teachings with children/ youth. • Crop yields are low and they need ideas on what to do. • Dependence on agrochemicals and moneylenders. • Poor management of animals, overgrazing. • Lost papers needed to continue FRA process (Salodih). • Some leaders misuse government funds by diverting to other purposes (e.g., for this reason in Dumartari their bridge project was denied). • Isolation due to lack of road access (Rajabhita). • Have electricity but not enough current (Dumartari).
Opportunities	Threats
<ul style="list-style-type: none"> • Obtain Aadhaar card from the government to receive flood control benefits (Tarobandh). • Plan to cultivate fruits and vegetables which can give them a good harvest (Kusmaha). 	<ul style="list-style-type: none"> • Unpredictable rain/ risk of drought or flooding and lack of irrigation makes agriculture and the family economy unstable, often obliging migration. • Improper demarcation of forest lands that encroaches on village land or denies villagers access to their fields; fines and confiscation of crops by Forest Department (Gardih, Kusmaha, Domdih, Bara Sindri). • Erosion and flooding during the monsoon season (Tarobandh).⁸⁴ • On agricultural lands: damage to crops from domestic animals loose (Tarobandh). • In the jungle: damage to crops from monkeys (Tarobandh). • People from other villages steal and cut down trees without permission (Gardih). • Concession of Jindal/ Adani Power Plant by the government could cause them to lose their land and livelihoods (Salodih)

Source: Community meetings in Rajabhita (24 July), Salodih (26 July), Tarobandh, Dumartari (31 July), Gardih, and Kusmaha (2 August 2018).

It was easy for villagers to list their strengths, weaknesses, and threats, but in only two villages could anyone think of opportunities. Strengths and weaknesses are very similar among villages.

The top threat of unreliable rain and poor harvest as the impetus for migration is ubiquitous to all

⁸⁴ In the early 2000's, Tarobandh had to relocate the entire village to another site due to monsoon flooding.

the villages surveyed. The high degree of unity and harmony in most villages is a major strength that will be needed to advance with the FRA and related processes.

Table 10 provides the perspective on the villages from BF Staff and Community Mobilizers. Although the office staff are not native to the region, the community mobilizers are. Their intimate knowledge as village ‘insiders’ combined with their higher level of education and experience in other regions of India provided valuable perspective for the analysis.

Table 10. SWOT Analysis of Villages with BF Staff and Community Mobilizers

Strengths	Weaknesses
<ul style="list-style-type: none"> • <u>Peace, harmony, and unity</u> in most (but not all) communities. • <u>Mutual support</u> and generally help each other when there is some problem. • <u>Capacity to solve their internal problems</u> in the <i>Grahm Sabha</i>. • <u>High level of respect for rules of the <i>Grahm Sabha</i></u> to maintain peace and harmony. 	<ul style="list-style-type: none"> • <u>Lack of unity in some villages</u> indicated by low meeting attendance and lack of understanding about the <i>Grahm Sabha</i> and the FRA. (These villages are: Amjora, Mohanpur, Sundarpahari, Terariya, Tilabaad). • The people of the villages generally respect their own <i>Grahm Sabha</i> rules but often <u>lack respect of rules from outside</u>. (Partly due to negative past experiences, e.g., being frustrated or cheated by outside interests or failed projects).
Opportunities	Threats
<ul style="list-style-type: none"> • <u>Pahal Residential High School</u> Plan to include practical knowledge, skills, and income generating opportunities (e.g., NTFP) in the curriculum; field visits, sharing with families, and multimedia are among the learning methods. • <u>Teach through practical application</u>. To truly help the villagers, teach sustainable livelihoods by doing <i>practically</i>, not only talking but <i>doing</i> together. Teach by example, showing the way side by side with love, concern, and action! • <u>Community Health Center of Sundarpahari</u> Named best medical facility in Godda District due to work of the chief medical officer with a dedicated team and supportive advisory committee. 	<ul style="list-style-type: none"> • <u>Disagreements between villages about property boundaries</u>. • <u>Forest Department denying access to villagers</u> through forest land between the village and where their fields are located, and the FD fines them for ‘trespassing’ (e.g., Domdih, Bara Sindri). • <u>Forest Department establishing borders that encroach on village land or deny access to traditional resources and sacred sites</u> (e.g., Domdih). • <u>Bribery of government officials</u> to get FRA registration by ineligible people (non-FDST/OTFD). • <u>Corrupt or inappropriate government projects</u> with negative outcomes (e.g., Rajabhita, Dumartari).

Source: Interviews with Badlao Foundation staff (Arvind Ji, Rajesh Yadar, Krishna Jee) before inauguration of the Pahal Residential High School, 22 July 2018; and Field Mobilizers (Betka Hembrom, Benjamin Hansda, Masih Kisku, Salomi Hansda) at Sidhu Kanhu Ashram of BF at Domdih on 4 August 2018.

BF staff and community mobilizers confirmed the villagers’ own perceptions of a generally high degree of harmony, mutual support, and capacity to respectfully solve their own problems as a

community. The threat of boundary disputes between villages is not one mentioned by the villagers. The Pahal Residential High School is soon to open and is considered as a particularly important opportunity, strategic for the work of the FRA project and part of the long-term vision of Badlao Foundation.

Examples of inappropriate projects listed as ‘threats’ are the incomplete and deserted road and bridge project in Rajabhita; the flush toilets/septic tank project in Dumartari, a village that lacks sufficient water even for drinking. Most such installations are never used for the intended purpose. These projects are mentioned as examples of how plans are made in government offices without clear understanding of the real needs and priorities of the people in the villages. *“Projects should be planned and carried out together with the people for whom they are intended to benefit.”*

3.7.2. Situation of Badlao Foundation

Badlao Foundation (BF) began in 1982 working with 39 villages of Santhal, Paharia, and Baurie (Dalit) peoples that had been displaced by construction of the Maithon Dam on the Barakar River by the [Damodar Valley Corporation](#) (DVC).⁸⁵ The construction of large dams, mining, industrialization, urbanization, and influx of migrants from other areas of India has led to their cultural and socio-economic marginalization.

The BF **vision** is of a socially transformed, self-reliant, and equitable society. Its **mission** is to empower people to achieve this vision by participatory efforts to restore access to and ecological

⁸⁵ See also: <https://ejatlas.org/conflict/maithon-dam-and-the-damodar-river-valley-project-west-bengal-india>.

balance with their *jal, jangal, zameen* (water, forest, land).⁸⁶ The BF main **thematic areas** are: natural resource management, livelihoods, and food security;⁸⁷ education, health, and nutrition; governance and social mobilization. BF projects are developed using bottom-up **participatory methods** including collaborative planning and mapping with communities of their natural resources. They also commonly facilitate meetings and workshops between communities and government officials to avoid or resolve problems arising from the directive top-down approach typical of State agencies.⁸⁸

Ongoing and recently completed **BF projects** include:

- Wasteland Agriculture Development Initiative (WADI) agroforestry plantations addresses livelihood, income generation, land/watershed conservation, and climate change mitigation. Initially farmers were hesitant to participate due to suspicion that BF was interested in their land.⁸⁹ By the third year trust and demand grew and now over 300 farmers are participating. BF has presented a proposal to the National Bank for Agriculture and Rural Development (NABARD) to renew the project with over 700 additional beneficiaries.⁹⁰

⁸⁶ *For a majority of poor Indians, survival directly depends on access to land, water and forest resources. See: <http://www.sruti.org.in/?q=key-issues/jal-jangal-zameen-0>.*

⁸⁷ In the area of natural resource management, livelihoods, and food security BF works with the SRI method of rice cultivation and paddy associated with *azolla*; rotational cropping of tail millets and lentils; WADI fruit orchards; vegetable cultivation; NTFP and leaf plate making; water development such as drinking water systems, check dams and bunds, and fish ponds: both small temporary ponds during the rainy season and larger permanent ponds.

⁸⁸ This is possible only because of BF long experience and reputation as an impartial organization. Initially BF was viewed by the government as a political threat but over time has demonstrated its neutrality and thus earned the government's confidence. BF follows the principles of Gandhi but does not espouse political views.

⁸⁹ This suspicion was due to past experiences with other actors engaged in fraudulent schemes that tricked villagers into planting trees as a means for land grabbing.

⁹⁰ BF was the first to encourage planting of fruit trees instead of acacias and eucalyptus promoted by the government. Some farmers and NGOs adopted first and then, years later, the government did too in the NABARD–WADI Project.

- Jharkhand Tribal Empowerment Project themes are land/water management, livelihood, empowerment of community and womens' SHG groups. The latter administer project funds and *Grahm Sabha* committees are formed for monitoring. Fund disbursements start small and increase with experience. The first year was difficult but SHG/ community management has improved and now over 100 families have invested in vegetable and small livestock production.

- Increasing Village Access and Tenure Rights over Forest Resources is the FRA Project with Oxfam India.

- Integrated Watershed Management Program works in areas of water and food security with support from NABARD's Rural Infrastructure Development Fund (RIDF).

- Sustainable Development of Livelihoods and Adaptive Response to Climate Change.

This project, recently concluded, operated from 2013 to 2018.

- Khadi Enterprise produces and markets fine hand-woven natural silk and cotton clothing. Started in 1990, this is the oldest project of BF and is now autonomous and self-sustaining.

- Johar Project to empower tribal communities and women's SHG with support of the British charity [Find Your Feet](#).

- Anganwadi Sevika Job Training Project with the Integrated Child Development Service (ICDS) of the Ministry of Women and Child Development.

- Initiative for Transparent and Accountable Governance Systems in Jharkhand included components on child and maternal health; education via school management committees; livelihood with Gandhi Scheme of community participation; and government liaison with health

and education agencies at Block and District levels. This initiative operated from 2014-2018 with support of the European Union and NGOs.

BF is mapping its **future direction** for the next decade in the fields of: 1) sustainable organic agriculture; 2) Sustainable Development Goals (SDGs); 3) livelihoods and governance, each related to addressing climate change. Changes in lifestyle toward a [circular economy](#) are needed in all these areas. Priorities going forward include: capacity/skill development and empowerment at village level with an integrated approach linked to other agencies and sources of support; livelihoods from agriculture/natural resources and value added in market chains; business plan development and scaling of social enterprises; and focus on developing replicable models.

An updated **financial model** is needed since international agencies are reducing funds to India in response to Modi's "we can do it on our own" position. This results in a survival challenge for many national and local CSOs and NGOs. Although foreign funding will not end immediately, it is gradually being curtailed. BF is starting a new project about early child marriage with the U.S.-based NGO [International Center for Research on Women](#) (ICRW). It also has a good base of CSR funding for the next five years but not enough to make up the shortfall from loss of foreign sources.⁹¹

⁹¹ Badlao Foundation has Corporate Social Responsibility (CSR) funding committed from Indian companies such as Tata Trust, HDFC Bank, and Axis Bank. Indian companies are required to invest at least 2% of profits on CSR to meet the mandate of the Companies Act of 2013. See: <https://thecsrjournal.in/top-indian-companies-for-csr-2019>.

In the context of the foregoing, the following SWOTS analysis was conducted with BF leaders (Table 11). BF is confident about its ability to overcome the multiple challenges it faces, with one exception: the extractive development model, epitomized by [open-pit mining](#), that represents a persistent **existential threat** to the land, livelihoods, and cultures of the Adivasi of Santhal Pargana.

Below is a summary of responses from the second interview with BF senior leaders.⁹²

What is the historical context of the forests in India and Santhal Pargana?

Forest once covered most of the country and forest tribal peoples are the ancestral foundation of Indian civilization. Many of the impoverished tribes of today were once proud and independent peoples (e.g., Paharia and Santhal). Santhal Pargana was originally the territory of the Sauria Paharia and was covered with forest of saal and asan. Before the British came most land was owned by the communities. This changed with the consolidation of the Zamindari System by the British East India Company in the late 1700s. The British designated large areas of land to the 'Zamindars' (educated local elites who, in this area of India, were Bengalis). They were given control of both cultivated and forest land (including 'wasteland') and the responsibility of collecting taxes from all people in their jurisdiction.⁹³ Thereafter, India's forests were plundered as never before. They were clearcut and sent downriver to ports for overseas export and used for railroad cars and ties. Much timber was harvested to fleece the corrupt British bureaucracy. (The Indian model of corruption was learned from the British). Forest Department officials (FDO) used to oblige tribals to collect firewood for FDO use and timber to build FDO houses. At the same time, they'd grant generous concessions to timber smugglers, accepting bribes instead of charging fines for violations. In the last 30 years, the destruction has grown even worse and now not much forest is left. Sundarpahari ('beautiful hill') has more forest than most areas of Santhal Pargana mainly because of poor road access from Godda.⁹⁴

⁹² **Source:** Interview with Bajrang Singh (BF Founder), Atal Bahari Sharma (BF Field Coordinator), and Rajesh Yadav (BF Coordinator-Domdih) at Green Wood Public School, Mihijam on 7 August 2018.

⁹³ The Zamindari System and forced labor were the major grievances of the rural population and were not legally terminated until the 1950s. Around 80% of the forests of Jharkhand were privately owned by the *Zamindars* up until the [Bihar Land Reforms Act of 1950](#). See also: Sethi, 2006.

⁹⁴ In 1936, 66% of the Santhal Pargana region was covered with forest; as of 2010 less than 10% of the land is under forest cover. Major reasons are increasing population pressure on forest resources, illegal logging, and weak enforcement of forest protection laws (Srivastava and Singh, 2012: 93).

Table 11. SWOTS Analysis of Badlao Foundation with Organization Leaders

Strengths	Weaknesses
<ul style="list-style-type: none"> • Four decades of <u>experience</u> with the communities of Santhal Pargana based on understanding of its peoples, languages, and cultures. • Mandate working only in Santhal Pargana with <u>focus</u> in 6 districts with priority to Paharia. • Participatory development <u>strategy</u> working with tribals and marginalized sectors with priority on women and capacity building for sustainable livelihoods. • <u>Recognized, respected, and trusted</u> by the communities, government agencies, and national/ international entities as an impartial non-political organization. • <u>Multiple sources of support</u> dependent not only on external funding but also works with Indian government agencies at various levels. • <u>Organizational model of sustainability</u> as an example for village initiatives. E.g., BF Khadi Enterprise and BITM are autonomous and self-sufficient. • <u>Democratic, transparent, and participatory mode of leadership</u>. Board members are not related by blood and meet 4 times/year. • <u>Strong relationships and communication</u> between the main offices and staff working in the field. 	<ul style="list-style-type: none"> • <u>Challenging to attract the right staff</u>. BF was formed from the heart and civil society is changing drastically. It's hard to attract people who can write good proposals and reports in English. Our region is considered marginal and few are willing to come here to work and lose their urban way of life. • <u>Struggle to keep up</u> with rapid technological changes e.g., new systems for fundraising, social enterprise and marketing. (Donors don't provide support for capacity development of NGO staff). • <u>Low understanding by donor agencies</u> in the North about the context and demands of BF's work. • <u>Susceptibility to changes in realities and agendas of global partners</u>. E.g., some partners are leaving India. Many donors are now dependent more on corporate funding that have their own agendas. BF commitment to its region, themes, and peoples is defined and will not change. • <u>Difficulties of working with government agencies</u>. Although resources are available from the government, their working culture -e.g., bureaucracy, corruption- is not conducive to organizations like BF. • <u>Lack of organizational reserve and village investment funds</u>. BF is sustainable day to day but does not have its own reserve or surplus to invest in the communities.
Opportunities	Threats
<ul style="list-style-type: none"> • <u>Government and NGOs need organizations such as BF</u> to connect with villages, SHG, etc. Focus of civil society and government has come to want to support tribals and BF is well situated to facilitate such work since it has a good reputation and is trusted for delivery of services. • <u>Funding is available</u> from government, CSR, and NGO sources. If resources are properly channeled, organized youth and women could access and develop effectively. • <u>Rural areas are more accessible</u> since literacy, roads, telecommunications, and awareness have increased. (Sundarpahari is also now easier to reach). 	<ul style="list-style-type: none"> • The <u>corporate agenda</u> to extract and concentrate wealth and control endangers the rights, resources, and livelihoods of communities and civil society. Corporations are gaining more power over politicians and influence of government policies. • <u>Government plans</u> to invite in foreign companies (e.g., Amazon, Walmart) that will replace many national and local businesses and create more unemployment. • Jharkhand is mineral rich and the <u>mining threat</u> is ever present. • <u>Climate change</u> is happening fast. e.g., the monsoon season started 15 days late this year.
Strategies	
<ul style="list-style-type: none"> • Core strategy remains working with total participation of communities (especially women) in village-level organization and governance + sustainable livelihoods + social awareness with a rights based approach = all these must be linked to achieve goals. • Capacity/skill development and empowerment of village-level institutions; livelihoods from local resources and adding value in market chains; business plan development and scaling of social enterprises (e.g., Khadi). • Widen impact by concentrating in smaller areas to create models that the government and others can adopt. E.g.: 1) Godda – model where there is still forest (11 hectares at Siddhu Kanu Ashram and Pahal Residential School–Domdih); 2) Jamtara – model where the forest is almost gone but the tribals are still present (5 hectares at Gandhi Ashram-Kewatjali, Green Wood Public School-GWPS and Indira Gandhi Open University-IGOU, Office and Store in Mihijam). 	

Source: Interviews with Arvind Ji (BF Executive Coordinator) at BF head office (6 Aug.) and with Bajrang Singh (BF Founder), Atal Bahari Sharma (BF Field Coordinator), and Rajesh Yadar (BF Coordinator-Domdih) at GWPS, Mihijam on 7 August 2018.

What is the priority need of the people of Santhal Pargana today?

Forest, land, and water is crucial for the people in this region. Since before the beginning of BF we visited the villages in barren lands to learn about their needs and aspirations. Drinking and irrigation water is their utmost priority. With these they can provide for their most basic health and livelihood necessities. When projects are made based on people's own priorities, then the participation is good and the project is successful. If not, and we try to put our ideas or priorities in their heads, then there will be problems.

How well do villages maintain projects on their own after support from BF ends?

Projects such as the wells, ponds, and check dams that were created 30-35 years ago are still being maintained because that was and still is the need of the villages. We have also introduced a number of new innovations but a lot of the villages haven't put in much effort, so there are some failures, but also successes. In some areas, settled organic agriculture will take more time since it is very hard to change old shifting cultivation habits. For example, some villages had planted vegetable plots that were later destroyed by rabbits. They soon gave up, saying "...why should we plant if it gets eaten?". Innovation is needed to learn new ways for crop protection.

What is the current status of wildlife in the region's forest remnants?

Rajmahal Hills was renowned for its rich forests and wildlife. Although smaller species are still present, elephants, tigers, sloth bears, peacocks, and others have been eliminated by poaching and habitat loss from deforestation.⁹⁵ Tigers were in the Rajmahal until the 1960-70s and elephants until the 1970-80s. Now the elephants are starting to come back. Last month (July 2018) elephants came to Godda all the way from the Darjeeling region (Himalaya foothills) of West Bengal. At the other end of Jharkhand, elephants are also starting to arrive from the south (from Sundergarh, Orissa). The elephants are returning because these are parts of their traditional migration routes. However, the problem is the fragmentation of habitat along these routes due to development pressures, and especially by widespread occupation of cattle.

⁹⁵ On the forest walks with villagers in this study, animals they mentioned that are still living in the remoter areas of Rajmahal are: wild boar, wild goat, squirrel, mongoose, porcupine, fox, wolf, monkey, and jungle cats.

Would it be possible to establish wildlife corridors for the elephants?

This is possible and India has a number of wildlife corridors.⁹⁶ The main challenge is how to minimize elephant-human conflicts, especially in cases of destruction of villagers' homes or crops. This is easier with the tribal peoples because they have a different kind of relationship with the plant and animal realms, and a much better understanding of their behavior.⁹⁷ In many areas habitat recovery will be needed to restore connectivity of elephant migration routes.

Have the governments' development programs benefitted the tribal peoples?

The government's concept of development is big scale industrialization and urbanization. In the tribal areas where major projects have occurred the people have been displaced. They lost their land and livelihoods and are now in process of losing their language and culture. Where mining and industrialization has already happened the environment is polluted and the people are acculturated. BF has an alternative concept of development. We believe development should be democratic, participatory, and designed according to local context and needs. Tribal/local cultures should not be displaced by "development". They should have access to services such as potable water and electricity and be able to improve their livelihoods and quality of life based upon their own local natural resources, agriculture, and enterprises. Instead, the government is imposing an extractive development model that is destroying everything.

Does this development model pose a threat to the villages in the area of this study?

Yes. In Sundarpahari Block a company has bought 400 acres for coal mining.⁹⁸ Initially, the villages protested in opposition to the project, but the company ended up gaining approval by paying off a few leaders, threatening or intimidating opponents, and giving a

⁹⁶ For an overview of elephant corridors in India see: www.sanctuaryasia.com/magazines/cover-story/6830-right-of-passage-elephant-corridors-of-india.html.

⁹⁷ In May 2017 an incident of elephant-human conflict with two human fatalities occurred in Bhagalpur District of Bihar and neighboring Godda and Sahebganji districts of Santhal Pargana Division in Jharkhand. This was due to water and food shortages, and human disturbance, that caused elephants to detour from their usual migration route. See: www.hindustantimes.com/patna/wild-elephant-kills-two-people-in-bhagalpur/story-PIS0zYmcklV9RHkh1VtjOL.html. Usually it is the elephants who are the victims of conflicts with humans. See: www.washingtonpost.com/news/animalia/wp/2017/11/08/the-horror-elephants-face-in-india-in-one-heartbreaking-photo. For examples of cooperation and coexistence between humans and wild elephants, see: Indian village bands together to free trapped elephant: www.youtube.com/watch?v=qa3SrK06Q0A. Also: Forest gardening with space for wild elephants: www.terra-genesis.com/forest-gardening-space-place-wild-elephants.

⁹⁸ Jharkhand possesses about 40% of the total mineral resources of India and occupies 1st position in coal reserves, 2nd in iron, 3rd in copper, 7th in bauxite, and is the sole producer of prime coking coal. Apatite, coal bed methane, dolomite, feldspar, graphite, limestone, manganese, mica, phosphorite, quartz, uranium, and gold are among the other important mineral reserves in the State. Source - <http://jharkhandminerals.gov.in/content/1/1>.

‘donation’ of 48 lakh rupees (R 4,800,000) to the villages. The company talked only about the positive aspects of the project and anyone who spoke about negative impacts was accused of being a [Naxalite](#) (i.e., communist rebel).⁹⁹ Mining is a menace not only to the villages near the mine, but to the whole region that will undergo water scarcity as aquifers recede and wells go dry due to massive extraction of water for mining.

What is your strategy to deal with the threat of mining?

As a society we still need to learn what Mahatma Gandhi said: “The world is big enough to satisfy everyone’s needs, but will always be too small to satisfy everyone’s greed”. But until we do learn, by ourselves there is little we can do to stop mining. In India, mineral deposits overlap with the homelands of tribal peoples. If minerals are under their jungle, the companies (with government support) will cut it down and displace the people to get it. Although the exploitation may be inevitable, at the very least the rights of the people should be protected; there should be no injustice. They should receive royalties or participate in profit sharing. Companies should use mining technologies that minimize damage to ecosystems and be held responsible for forest landscape and watershed restoration. Rehabilitated areas should be used for water storage, groundwater recharge, and recovery of native agro-forests returned to village stewardship.

3.7.3. Local Issues in Global Context

India is in a difficult situation. Instead of moving toward the vision of social justice and sustainable development espoused by Gandhi, the Indian government’s recent ‘post-COVID’ mining and environmental policies are heading in the opposite direction, in violation of its own commitments to the **Paris Climate Agreement** (PCA).¹⁰⁰ This reflects a global trend and is not unique to India. The two essential dimensions to achieve the objectives of the PCA (2015) are a rapid transition from fossil to renewable sources of energy and materials, and the conservation and restoration of

⁹⁹ Left-wing extremism is motivated by the alienation of local communities from their land and natural resources. Although some Naxalite activity exists in the Santhal Pargana Division of Jharkhand, Godda District is not currently affected and Sundarpahari Block has had no incidents for over a decade. In India’s ‘[Red Corridor](#)’, Chhattisgarh state is where rebels are most active. (Source: Rajesh Yadav, BF Coordinator-Domdih, August 2018). See also: Shah, 2010.

¹⁰⁰ See: www.livemint.com/news/india/india-liberalises-coal-mining-mineral-sector-11589628048539.html; <https://india.mongabay.com/2020/03/indias-proposed-overhaul-of-environment-clearance-rules-could-dilute-existing-regulations>.

healthy ecosystems. Contrary to the Paris Accord, public subsidies, finance, and concessions for fossil fuels are increasing globally, endangering our climate and most biodiverse ecosystems including protected areas and territories of Indigenous Peoples and local communities (IPLC).¹⁰¹

India is also signatory to the **United Nations Declaration on the Rights of Indigenous Peoples** (2007) that includes their right to [free, prior and informed consent](#) (FPIC) about any project that concerns their lives and resources.¹⁰² Today, IPLC territories worldwide are under siege by the rapid expansion of development projects undertaken without their FPIC, e.g., infrastructure, oil/gas/mining,¹⁰³ large scale land acquisitions (LSLA) or ‘land grabbing’ for industrial agriculture and cattle ranching,¹⁰⁴ and ‘green grabbing’ for conservation areas and carbon schemes.¹⁰⁵ Although funding to protect forests and include IPLC is increasing (e.g., REDD+),¹⁰⁶ the sums are minimal compared to investment in projects that drive their destruction.¹⁰⁷ The gap between IPLC legal and customary rights, combined with global trade and investment policies, government fiscal and foreign debt crises, failed agrarian reforms, and endemic corruption make them particularly vulnerable to dispossession. IPLC defenders who struggle to prevent this are facing harassment

¹⁰¹ See: www.economist.com/leaders/2019/02/09/the-truth-about-big-oil-and-climate-change?cid1; <https://e360.yale.edu/features/the-plastics-pipeline-a-surge-of-new-production-is-on-the-way>; www.climate-transparency.org/g20-climate-performance/g20report2019; www.banktrack.org/article/banking_on_climate_change_fossil_fuel_finance_report_card_2020.

¹⁰² United Nations’ Declaration on the Rights of Indigenous Peoples (UNDRIPS): www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html. See also: U.N. Declaration on the Rights of Peasants (2018) - <https://undocs.org/en/A/C.3/73/L.30>.

¹⁰³ Jharkhand Forum - Adivasi Women’s Life in Mining Areas: www.youtube.com/watch?v=N6_D_dR5-b0; *The Real Avatar: Mine - Story of a Sacred Mountain*: www.youtube.com/watch?v=R4tuTFZ3wXQ.

¹⁰⁴ See: www.cornell-landproject.org; Baka, 2013.

¹⁰⁵ See: www.tni.org/en/article/green-grabbing; Fairhead *et al.*, 2012.

¹⁰⁶ Reduction of Emissions from Deforestation and forest Degradation (REDD): www.forestcarbonpartnership.org/what-redd; <https://redd-monitor.org/redd-an-introduction>.

¹⁰⁷ The \$20 billion in ‘green finance’ invested from 2010-2017 to reduce deforestation contrasts with over \$777 billion in ‘grey finance’ to subsidize industrial agriculture. Climate Focus 2017. Progress on the New York Declaration on Forests: https://forestdeclaration.org/images/uploads/resource/2017_NYDF_Goal8-9-Assessment_ExecSum.pdf. See also: Sizer, 2000; Myers, 2008: www.iucn.org/content/perverse-priorities.

and violence by state and corporate actors trying to silence their dissent.¹⁰⁸

The opposition of IPLC to projects imposed without their FPIC is not just about preserving their own territories, but of **defending the integrity of life on Earth** and fulfilling our stewardship responsibility toward future generations. It's a scientifically accepted fact that to avoid catastrophic consequences of climate change a high proportion of fossil fuel reserves must remain unexploited.¹⁰⁹ Larrea and Murmis (2016) propose that biodiversity hotspots and IPLC territories be top priorities to define where to keep such reserves underground.¹¹⁰ This proposal needs to be adopted and expanded to include mineral reserves since the transition from fossil to renewable energy entails a drastic increase in mining of 'transition minerals'.¹¹¹ Since extractive industries are already responsible for half of GHG (and most other toxic) emissions, such an escalation would counteract the benefits of 'clean energy' by multiplying the ruinous impacts of mining.

Policies and incentives to speed the transition from an extractive to an efficient **circular economy**, including the development of substitute materials, technologies, and recycling to minimize dependence on (and impacts from) both metallic mining and fossil fuels are imperative.¹¹² How

¹⁰⁸ See website by the Rights and Resources Initiative (2018): www.theyshouldhaveknownbetter.com.

¹⁰⁹ See: McGlade and Ekins, 2015. The IPCC Report of October 2018 urges that global warming be held to 1.5°C: www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments; <http://priceofoil.org/2016/09/22/the-skys-limit-report>.

¹¹⁰ Larrea and Murmis. 2016. Unburnable carbon and biodiversity. Oxford: Fossil Fuel Supply and Climate Policy. www.researchgate.net/publication/316841935_Unburnable_Carbon_and_Biodiversity_A_Global_Fund_for_Keeping_Fossil_Fuels_in_the_Ground_in_Biodiversity_Hotspots_of_Developing_Countries_Conference_Paper_Fossil_Fuel_Supply_and_Climate_Policy_Conference; www.theguardian.com/environment/andes-to-the-amazon/2015/feb/09/we-can-start-leaving-the-oil-in-the-ground-right-now-heres-how.

¹¹¹ See: <http://documents.worldbank.org/curated/en/207371500386458722/The-Growing-Role-of-Minerals-and-Metals-for-a-Low-Carbon-Future>. ('Transition minerals' include cobalt, copper, lithium, manganese, nickel, silver, and rare earth metals.) www.reuters.com/article/us-copper-demand-electric-vehicles/copper-demand-for-electric-cars-to-rise-nine-fold-by-2027-ica-idUSKBN1940PC; <https://earthworks.org/publications/responsible-minerals-sourcing-for-renewable-energy>.

¹¹² www.worldbank.org/en/news/press-release/2019/05/01/new-world-bank-fund-to-support-climate-smart-mining-for-energy-transition; <https://earthworks.org/publications/ngo-letter-to-the-world-bank-re-mining-renewables>.

can biodiversity be both protected and used to help meet this challenge? How can we create an inclusive and regenerative economy that restores (rather than degrades) the integrity of our biosphere? How can IPLC be allies/beneficiaries (rather than collateral damage) of ‘development’? Such questions are not just about technologies, but transforming the development paradigm toward participatory democracy and ‘[economy of nature](#)’.¹¹³ On this question India has provided inspiration for the world ever since Gandhi to the [Earth Democracy](#) movement of today.¹¹⁴

Historically, evidence of republican **participatory democracy** in ancient India exists since the [Vedic period](#) (1500-500 BC) as documented in the [Rigveda](#); texts of the Buddhist period (600 BC-200 AD) written in Pali; Sanskrit literature by [Panini](#) ([Ashtadhyayi](#)) and [Kautilya](#) ([Arthashastra](#)) between 400-500 BC; as well as accounts by Greek historians Arrian ([Anabasis](#)), Diodorus Siculus, and Megasthenes. [Sangha](#) was the term for self-governing groups or communities in which decisions were made by their members under agreed conventions. The strongest of such groups operated as sovereign governments referred to as ‘republics’. These were subsumed by the succession of empires from around 300 AD until Independence in 1947, but continued to function (and still do) at guild and village (*Grahm Sabha*) levels under the dominant political order.¹¹⁵

Integrated landscape management (ILM) is an emerging approach to territorial governance among diverse stakeholders in local bioregions applying principles of participatory democracy,

¹¹³ See also: www.economicdiscussion.net/articles/economic-ideas-of-mahatma-gandhi/21133; www.mapsofindia.com/personalities/gandhi/economic-ideas.html. M. Gandhi (Ed. Iyer, 1991). Essential Writings.

¹¹⁴ Shiva, 2015, 2020. See also: www.theguardian.com/world/2017/mar/21/ganges-and-yamuna-rivers-granted-same-legal-rights-as-human-beings; www.ejatl.org/conflict/river-ganga-natures-rights.

¹¹⁵ See: www.pragyata.com/mag/democracy-in-ancient-india-295. From the Rigveda (10/191/2) is a *sloka* sung together at the beginning of *Sangha* assemblies: “We pray for a spirit of unity; may we discuss and resolve all issues amicably, may we reflect on all matters without rancor, may we distribute all resources to all stakeholders equitably, may we accept our share with humility.”

evocative of the *Sangha*. ILM aims to simultaneously achieve shared landscape goals around agricultural production, nature conservation, and livelihood. Design aspects of ILM include a strong multi-stakeholder platform, shared understanding, collaborative planning, effective implementation and monitoring for adaptive management and accountability. Synergies, trade-offs, and land use practices that contribute to multiple objectives are identified early to focus on the most promising options. Policies, programs, and markets that optimize synergies and minimize trade-offs are facilitated by designated institutions to enable the process among stakeholders (Buck *et al.*, 2017; Scherr *et al.*, 2014; Messier *et al.*, 2015).

An ILM approach will be critical for the success of major **forest and landscape restoration** (FLR) initiatives, principally the [U.N. Decade on Ecosystem Restoration](#).¹¹⁶ The goal is worthy but will be meaningful only to the degree that it is accompanied by conservation of intact ecosystems; recognition and respect of IPLC rights; and transformation of the current unsustainable development model. The measure of success for both ILM and FLR will be how well it works in the most challenging landscapes where mineral deposits coincide with IPLC territories, such as in Jharkhand. Tenure, governance, and equity considerations will be paramount to assure that IPLC rights are protected (McLain *et al.*, 2017). In cases where mining inevitably does occur, IPLC “should receive royalties or participate in profit sharing. Companies should use mining technologies that minimize damage to ecosystems and be held responsible for forest landscape and watershed restoration. Rehabilitated areas should be used for water storage, groundwater recharge, and recovery of native agro-forests returned to village stewardship” (Bajrang Singh, interview 7 August 2018).

¹¹⁶ See also: Bonn Challenge on Forest Landscape Restoration: www.bonnchallenge.org/content/challenge; Global Partnership on Forest and Landscape Restoration (GPFLR): www.forestlandscaperestoration.org.

Of the many forms of FLR, [rehabilitation](#) of mined lands with forest is the most complex and costly.¹¹⁷ Although the technical capacity exists (Chaturvedi *et al.*, 2014; INBAR, 2014; Preeti Singh and Lakhran, 2017), the **political will and financial responsibility** required to do it properly remains in doubt. This would necessarily include investment in long-term ILM processes, including the feasibility studies before mining begins to fully calculate communities' lost agricultural revenue potential as the basis for determining just compensation (Quillérou and McNeill, 2016). It needs to continue long enough after mining ends to accomplish soil and vegetative recovery, mining waste detoxification, and restart of a diversified agro-forest economy (Todd *et al.*, 2010).¹¹⁸ Only in this way can the true cost of open cast mining be approximated.

However, it seems unlikely that **industries habituated to subsidies**, externalities, and privatization of the commons will be inclined to make such investments.¹¹⁹ Looking at large-scale land acquisitions in general (including mining), “research suggests that land deals often take place in areas already under small-scale or subsistence production with the intent of producing commodities for export; investors often make promises about inclusion and community development, but find themselves unwilling or unable to follow through; free, prior and informed consent is crucial but often lacking; and people often engage in labor and markets directly tied to the investment rather than having their opportunities expanded or improved more generally” (Wolford, 2015).

¹¹⁷ Forest ecosystems cannot be truly ‘restored’ to previous condition, but with adequate investment the land can be rehabilitated so that soil, water, vegetation, and local agro-forest economies can recover.

¹¹⁸ See also: Forestry Reclamation Approach, Appalachian Regional Reforestation Initiative (ARRI) – <https://arri.osmre.gov/FRA/FRAApproach.shtml>.

¹¹⁹ See: www.indiawaterportal.org/topics/privatisation; www.indiawaterportal.org/topics/mining; www.indiawaterportal.org/articles/conflicts-over-land-rise-india.

Yet hope remains that the emerging new breed of ethical **impact investors and entrepreneurs** will help to influence a shift toward a reciprocal development model. Creative initiatives to mobilize private sector finance by leveraging public and philanthropic funds for ecosystem conservation/restoration and reaching the SDGs are underway.¹²⁰ To achieve their potential it is critical to include as equals and empower as partners the IPLCs, the world's preeminent and -at the same time- most endangered stewards of ecosystems and biodiversity.

3.7.4. Assets, Needs, and Aspirations

This section provides insights into the current situation of villagers, especially youth and women, and what sort of future they aspire to. This will provide context needed to consider potential livelihood opportunities related to FRA implementation.

Table 12 summarizes responses of individual interviews with male youth. Although attempts were made to also interview female youth this was not possible to do on an individual basis. They were interviewed collectively in the focus group discussions with the *Mahila Sabha* women's self-help groups (see Table 14).

¹²⁰ For example, the Coalition for Private Investment in Conservation (<http://cpicfinance.com/about/>), Global Landscapes Forum (www.globallandscapesforum.org), and the 1000 Landscapes Collaboration (<http://landscapes.global>) support the SDG 15-Life on Land, particularly SDG target 15.3 on Land Degradation Neutrality (LDN), as well as the UN Decade on Ecosystem Restoration and the Bonn Challenge.

Table 12. Skills, Interests, Needs, and Aspirations for the Future-SINAF Interview with Youth

Initials / Gender – Home Village – Education Level	Skills	Interests and Aspirations	Needs
<u>B.T.</u> / M Chota Savaikundi No formal education	<ul style="list-style-type: none"> • Farming • Business • Tailoring 	<ul style="list-style-type: none"> • Animal husbandry • Buy a tailoring machine • Provide well for my family • Educate my children in a good school 	<ul style="list-style-type: none"> • Seeds, water, fertilizer • Funds for farming and to start a business • Training for farming and for tailoring
<u>S.M.</u> / M Kusmaha	<ul style="list-style-type: none"> • Carpentry 	<ul style="list-style-type: none"> • Repair mobile phones • Driving 	<ul style="list-style-type: none"> • Building my own house
<u>N.H.</u> / M Kusmaha Education up to 9 th grade	<ul style="list-style-type: none"> • Driving • Business • Farming • Leaf plate making 	<ul style="list-style-type: none"> • Automobile repairing • Leaf plate business • Provide well for my family • Educate my children so that they can have a better life 	<ul style="list-style-type: none"> • Renew driver license • Leaf plate machine • Training for farming • Farming loan
<u>M.H.</u> / M Kusmaha 12 th grade	<ul style="list-style-type: none"> • Driver 	<ul style="list-style-type: none"> • Leaf plate making • Computers • To become a physician 	<ul style="list-style-type: none"> • Training to become a basic physician
<u>P.S.</u> / M Kusmaha	<ul style="list-style-type: none"> • Farming 	<ul style="list-style-type: none"> • Vegetable farming 	<ul style="list-style-type: none"> • Training in vegetable farming
<u>B.M.</u> / M Kusmaha	<ul style="list-style-type: none"> • Farming 	<ul style="list-style-type: none"> • Vegetable farming • Irrigation • Animal husbandry 	<ul style="list-style-type: none"> • Training in vegetable farming and animal husbandry
<u>G.M.</u> / M Rajabhita 10 th grade	<ul style="list-style-type: none"> • Farming • Football • Painting • Motor mechanic 	<ul style="list-style-type: none"> • Motor mechanic • Painting • Football • Computers • To provide education to my family and the village so that they can have a better life 	<ul style="list-style-type: none"> • Mechanic equipment and training for repairing cars and engines • Painting equipment • Coaching for football • Computer training

Source: Interview with youth after lunch in Gardih, 31 July 2018.

Of the seven male youth interviewed (see Table 12) five work in agriculture and NTFP. Of these, four out of five want to continue farming but seek further training to improve their skills and productivity. Those interested in other livelihoods (carpentry, mechanics, medicine) wish to continue living and working in the same region. Their main needs are training and inputs or equipment for developing their skills and realizing their livelihood aspirations.

Table 13 is a composite of responses from Focus Group Discussions with youth in three villages.

Table 13. SINAF Focus Group Discussions with Youth

Current participation and seasonality of agricultural and NRM livelihood activities		
Activities		Months
• Cultivation of rice paddy, maize, sweet potato; silkworm.....		Monsoon season (July – September)
• Cultivation of potato, brinjal (eggplant), tomato, vegetables.....		Winter (October – March)
• Collecting mahua flowers, tendu leaves, firewood.....		Summer (April – June)
• Migration for outside employment.....		November – April
Skills	Interests	Needs
<ul style="list-style-type: none"> • Farming • Animal husbandry • Broom making • Cot making • Mat making • Carpentry • House construction • Paper decorations • Painting • Sports 	<ul style="list-style-type: none"> • Farming..... • Vegetable farming..... • Animal husbandry..... • Education • Football..... • Plow making • Tailoring clothes..... • Puffed rice making • Forming a youth group in their community..... 	<ul style="list-style-type: none"> • Loans for farming • Support for building own houses • Shelters for their animals • Fields for playing football • Sewing machines • Support to form and train youth group
Aspirations		
<ul style="list-style-type: none"> • Obtain good seeds for cultivating and selling vegetables • Poultry farming • Building own houses • Good electricity • Improvement of public schools • Become a doctor • Go into business opening a general store • Form group of village youth to do the contracts for works in the village (Kusmaha) 		

Source: Focus Group Discussions with youth in Bariyarpur (1 Aug.), Gardih and Kusmaha (2 August 2018).

Virtually everyone who participated in these discussions are engaged in the seasonal agriculture, NTFP, and migration economy (see Table 13). They would prefer to avoid migration if they can improve their farming and living conditions without it. Many consider vegetable and poultry farming as the most promising options and seek loans to invest in scaling up production. However, they recognize this is not feasible without more reliable sources of water. The youth of Kusmaha have formed a group with the aspiration of becoming contractors of public works projects in the villages. They are motivated out of their indignation with failed government and NGO initiatives

and of outsiders who come to “tell them what to do” on projects that are not their priority. They are certain they will do a better job to truly serve the villages, without corruption, and that villagers themselves should be the ones getting paid to do the work. (See footnote 71).

Table 14 summarizes the responses from discussions with the *Mahila Sabha* of two villages.

Table 14. SINAF Focus Group Discussions with Women’s Self-help Groups

Current participation and seasonality of agricultural and NRM livelihood activities		
Activities	Months	
• Making of leaf plates	All year	
• Harvesting mahua flowers and processing into wine.....	April – June	
• Harvesting and selling tendu leaves.....	March – May	
• Harvesting and selling mango, jamun (black plum), custard apple.....	June – July	
• Planting of mango and mahua plants.....	July – August	
• Sericulture.....	October	
Skills	Interests	Needs
<ul style="list-style-type: none"> • Leaf plate making • Mat making • Broom making • Farming 	<ul style="list-style-type: none"> • Sericulture • Farming 	<ul style="list-style-type: none"> • Better water supply • Development in leaf-plate making business
Aspirations		
<ul style="list-style-type: none"> • Good education and better opportunities for their children • More income • Improve their community by working on different committees • Wiping out illiteracy • Adapting new techniques into their system 		

Source: Focus Group Discussions with women’s Self-help Groups in Mohanpur and Salodih, 1 August 2018.

The women of both of these *Mahila Sabha* are totally engaged in the farming-NTFP economy (see Table 14). Leaf-plate making is their major source of year-round income and they would like to strengthen it to become more profitable, to improve their homes, communities, and provide education and better opportunities for their children. Several mentioned they would like to do more vegetable farming but lack a reliable source of water to do so. Availability of water, clean cooking fuel, and fodder for their animals would be a huge relief to their daily burden of labor.

Table 15. SINAF Interview with Badlao Foundation Community Mobilizers

Name – Home Village – Education Level	Skills	Interests and Aspirations	Needs
<u>Benjamin Hansda</u> Dumartari 10 th grade Started work at BF in July 2017	<ul style="list-style-type: none"> • Farming • Animal husbandry • Making flowers from paper 	<ul style="list-style-type: none"> • Poultry farming, animal husbandry on larger scale • To earn more money to send my children to a good school 	<ul style="list-style-type: none"> • Seeds and irrigation • Funds to buy animals and training in animal husbandry
<u>Masih Kisku</u> Chandna Started work at BF In 2018	<ul style="list-style-type: none"> • Driving motorcycle • Farming 	<ul style="list-style-type: none"> • Social work • Vegetable farming • Be a good example for the people of my society to improve their livelihoods 	<ul style="list-style-type: none"> • Computer training • Funding • Books
<u>Salomi Hansda</u> Sundermore Sarva Siksha Abhiyan , Baalika Siksha Girls School. Previous experience: India Sanstha, Bharti Jaanjagruiti Seva Trust. Started work at BF in Sept. 2014	<ul style="list-style-type: none"> • Tailoring • Cycling • Social work 	<ul style="list-style-type: none"> • Social work • Farming • Help guide the people of the villages toward a brighter future 	<ul style="list-style-type: none"> • Training in capacity building and use of computers • Funding • Books
<u>Betka Hembrom</u> Dumartari 12 th grade Started work at BF in June 2018	<ul style="list-style-type: none"> • English • Teaching • Speaking • Cycling • Music 	<ul style="list-style-type: none"> • Helping the poorest • Caring for the children and the elderly • Inspiring people to protect the forest • Be a good officer to help villagers with the FRA • Get a good job to care for my family 	<ul style="list-style-type: none"> • Training in use of computers • More training about FRA • Further study and training to get a better job and salary
<p>What do you need to be successful in you work? <i>Proper transportation is needed since we must visit many villages. Currently we use bicycles or public transport and pay from our own funds, which means we can visit only one village per day. Masih is the only one who has his own motorcycle and thus can visit two villages per day and receives a stipend of R300/month for fuel. This amount is used in only one week and thereafter he must pay from his own pocket. Masih suggest R1000/month for fuel cost for work. The community mobilizers (Benjamin, Betka) who go by bicycle receive no stipend. They must spend more time and physical (food) energy to travel by bicycle but are not similarly compensated.</i></p> <p>Recommendation: The project should provide an electric bicycle or motorcycle to each community mobilizer <i>or</i> help them to buy their own that can be paid on installment. They should also receive an adequate monthly stipend for fuel and vehicle maintenance proportional to use on the project. If community mobilizers use their own bicycle they should be compensated fairly for fuel (i.e., extra food) and bike maintenance.</p>			

Source: Interview with BF Community Mobilizers at Sidhu Kanhu Ashram of BF at Domdih on 4 August 2018.

Badlao Foundation at Domdih has an experienced and effective group of community mobilizers that are the key front-line workers to implement the FRA with the villages. All aspire to improve their professional capacities and incomes to better support their families and serve their communities (see Table 15). Their needs are similar to those of the five villages in Table 16.

Table 16. Livelihood Training, Capacity Building, and Resource Needs Identification

Needs	
Training/ Capacity Building	Resource/ Funding
<ul style="list-style-type: none"> • Improved cultivation practices • New ways to process mahua fruit • Income generation and enterprise development • Animal husbandry • Poultry farming 	<ul style="list-style-type: none"> • Water and energy systems to be able to invest in producing more and better crops, and to cultivate all year long to avoid the need for migration and/or excessive extraction from the forest. • Help from the Forest Department to reproduce and plant more trees to improve both farm productivity and prevent losing the forest they have. • Educational loans or scholarships • Good roads • Improvement in government services and public schools • Support for building or improving our own homes
Ideas for Improving Livelihoods	
<ul style="list-style-type: none"> • Vegetable farming: <i>79arbate</i> and other vegetables don't need too much water and sell readily in the <i>haat</i> market. Cultivating a greater variety and volume of vegetables and herbs would attract more buyers (Tarobandh). • Leaf plate making: acquire machines to improve production quantity, quality and price of leaf plates (Kusmaha). • Poultry farming: chickens mostly feed on insects and are easy to sell (Benjamin Hansda). • Pig farming: they mostly forage for themselves and can be sold in 1-2 years (Betka Hembrom). • Access new markets to get better prices, earn more income, and have a brighter future (Gardih). • Form a youth group in the village and obtain the skills needed to contract public works projects in the villages: <i>"We can resolve our own problems without having outsiders come in to rule our society"</i> (youth of Kusmaha). 	

Source: FGDs in Tarobandh, Gardih (31 July), Bariyarpur (1 Aug.), Gardih, Kusmaha (2 Aug. 2018).

Most villagers want to improve the farming and non-timber forest product (NTFP) economy of their own region. Main needs are training and start-up capital for agriculture and small enterprise. Many have expressed the desire to build their own homes or to improve the ones they have. Everybody mentions the need for better water systems. The youth of Kusmaha are unique as the only group who wishes to become public works contractors in the villages (see Table 16).

3.8. Perspectives on Forest Rights Act Implementation

Fulfillment of the Forest Rights Act requires reconciliation of divergent perspectives. An understanding of the views of both forest-dwelling CBOs and their CSO partners, on the one hand, and government authorities (especially the Forest Department), on the other, is critical. The interviews summarized in Table 17 provide insights into their contrasting positions.

Table 17. FRA Implementation: Civil Society Organization and Forest Department Perspectives

Topics/ Questions	Summary of Responses	
	Sanjay Basu Mullick <i>Jharkhand Jangal Bachao Andolan-JJBA</i> (Jharkhand Save the Forest Movement)	D.K. Sriwastawa Indian Forest Service-IFS (IFS-Jharkhand, Retired)
Professional background	Eight years working with tribals before returning to complete honors course in English and study in the Tribal Languages Department, learning Mundari, and earning PhD at Jharkhand University. Chosen by tribals to present their case during formation of the State of Jharkhand (2000) and preparation of the Forest Rights Act (2006). Taught at the Tata Institute of Social Sciences . Founder member of JJBA (2000), currently working in 400 villages with community mobilization and NTFP livelihoods. Coordinates with national/international organizations for legal recognition of forest lost during the colonial period.	Graduated from Indira Gandhi National Forest Academy (Dehradun). Served the Indian Forest Service for almost 35 years (1979–2014). Also, completed PhD on ‘Ethnobotany of Santhal Pargana’ (1977-1986). Assigned to first IFS management position in Bihar (1981) and later became Principal Chief Conservator of Forests of Jharkhand. Responsible for implementing legislation to efficiently manage and safeguard the state’s forest assets and biodiversity. Was head of the intergovernmental commission charged with oversight of FRA implementation in Jharkhand.
What is your view on the FRA?	The FRA contains most of the rights that tribals have been aspiring to including NTFP. The challenge now is that Jharkhand is the lowest ranking state for FRA implementation. Mobilization by the communities is needed to oblige the government to act. This is formidable since many villages are dispersed by migration to survive and have reduced capacity to organize and participate in such actions.	The FRA is a tool for recognizing and managing the rights of tribal (FDST) and other (OTFD) forest peoples. Important to understand that FRA is not a gift and that the rights are accompanied with responsibilities. The character of land use should not change. Applications must be filed within the specified time including the evidence of inhabitation and livelihood required to prove the claim.
What are the challenges to overcome and interventions needed to implement the FRA?	The colonial Indian Forest Act of 1927 (IFA) is contradictory to the FRA and allows bureaucrats to manipulate and dilute FRA implementation. The State/Forest Department(FD) took four years to formulate rules with excessive hurdles to make people exhausted, frustrated, and give up. We will not give up and in 2014 we told the government that the villages will proceed with the FRA whether they cooperate or not. After the <i>Grahm Sabhas</i> submit their official FRA claims, and while the government does the paperwork, they will advance with their own process to assert their rights: 1) Discussion and formal approval of the FRA in the village assembly (<i>Grahm Sabha</i>); 2) Placement of signs at strategic locations declaring the <i>Grahm Sabha</i> is implementing the FRA; 3) Definition of FRA rules at village level through participatory workshops; 4) Activation of village patrols to protect the forest.	The FRA and IFA are compatible if implemented in the spirit intended. Both laws are legally required to be executed and any conflict between them would need to be decided judicially. FRA claimants must show identification of land and beneficiaries, verified by FD site visit and report. If criteria are met claims cannot be denied; conversely, false claims cannot be permitted. If improper claims are allowed than the granting authority will be held liable. FRA implementation must be based on good understanding (careful reading) and following of protocols. It is difficult because most tribals are not literate. The FD, Welfare Dept. and Revenue Dept. are equally illiterate about the intricacies of the FRA. Training and facilitation between all parties is key. The <i>Panchayat</i> level should designate a third party such as a qualified CSO or NGO to lead this process. It should include capacity building, hand holding, and vigorous monitoring as needed to get done.

Source: Interview with Sanjay Basu Mullick (Executive Secretary of Jharkhand Jangal Bachao Andolan) at JJBA Office in Ranchi on 8 August 2018 (accompanied by Sapna Surin, OIN). Interview with D.K. Sriwastawa (Retired Principal Chief Conservator of Forests–Jharkhand, Indian Forest Service) at his home in Ranchi on 11 August 2018 (arranged by Bajrang Singh, BF).

JJBA views the FRA as a matter of social justice related with India's colonial past.¹²¹ The tribal mind and worldview is very different from that of mainstream society.¹²² The elites of India have adopted mechanisms (including the English language) of the British colonial system to maintain dominance. Jharkhand has a history of tribal displacement by both development projects (e.g., dams, mines, power plants) and conservation areas.¹²³ A huge backlog of cases for compensation and resettlement remain unresolved. Definition of boundaries between Forest Reserves and tribal areas is ongoing and further complicated by the government opening of their territories to exploitation by corporations, without tribal consent.¹²⁴ Strong leadership to challenge such policies is absent. Although some people in government are well meaning, they do not understand tribal culture and issues of tribal self-determination are ignored.

By contrast, the **IFS orientation** is more technical and now largely focused on climate policy. The [Indian Forest Service](http://ifs.nic.in) (<http://ifs.nic.in>) is one of three [All India Services](#) of the Government of India and is under the Ministry of Environment, Forest and Climate Change ([MoEFCC](#)). About 30% of Jharkhand's territory is forest managed directly by the FD, which is about 40% when tribal lands with forest cover are included. Almost 30% of the state's total population is tribal and most live in or near forest areas. These areas have been shrinking since the mid-1980s despite efforts to

¹²¹ JJBA started in 2000 as a joint campaign between the Bindrai Institute for Research Study and Action ([BIRSA](#)) and the International Work Group for Indigenous Affairs ([IWGIA](#)), and became an organizational platform to defend and strengthen the forest/NR rights of Jharkhand's Adivasi communities.

¹²² Among the Indo-Aryan languages, Hindi is the *lingua franca* constructed from dialects of northern India. Jharkhand also has many local dialects from three tribal language categories: Dravidian, Austro-Asiatic, and Tibeto-Bahun. Despite linguistic differences, tribal peoples share similar land-based worldviews and cultural traits.

¹²³ For example, the [Palamu Tiger Reserve](#) is one of India's first such reserves. See: <https://scroll.in/article/854452/as-jharkhand-attempts-to-stem-decline-in-tiger-population-in-state-adivasis-fear-second-uprooting>.

¹²⁴ See examples in Jharkhand: <https://wrm.org.uy/articles-from-the-wrm-bulletin/section1/india-indigenous-movement-in-jharkhand-challenge-plans-for-industrial-development-that-threatens-to-destroy-adivasi-forests-farmlands-and-way-of-life>; www.forestpeoples.org/en/topics/rights-land-natural-resources/publication/2010/forest-department-jharkhand-india-brutally-rep.

reverse deforestation. In recent years Jharkhand has increased tree cover with plantations but these are monocultures, not natural forests. Awareness about the importance of forests is growing as they decline while climate change intensifies, which highlights the need for India to honor its commitments to the Paris Climate Agreement. In Jharkhand, the MoEFCC-FD is working on the State-Level Climate Change Action Plan in cooperation with the [UNDP](#).¹²⁵

Since 2000, JJBA has advocated for the abolition of the [Indian Forest Act of 1927](#) (IFA) because it is a colonial era law contrary to the FRA. This attempt has yet to succeed and now since the FRA was passed in 2006, both laws are in force. JJBA considers the non-cooperative attitude and excessive delays of the State/FD as the major impediment to FRA implementation.¹²⁶ The villages have decided to **assert their FRA rights** even if the State does not fulfill its part. This is justified because they are not requesting rights (already preexisting) but merely the formality of registration. Among the 400 villages where JJBA works, 221 are following the four-step FRA process (outlined

¹²⁵ The United Nations Development Program-UNDP has been working in India since 1951 (www.in.undp.org) and currently has 30 projects, including in Jharkhand, with an office in Ranchi. See: <https://www.undp.org/content/dam/india/docs/prodoc-Market-Transformation.pdf>. According to Dr. Sriwastawa, *Greater investment with participation of other entities is needed, especially since a large portion of the population lives in precarious conditions. It is essential to clearly define the development model, which is a subjective determination. My own definition would include unpolluted air, clean water, pesticide-free food, and so on. Jharkhand and other states with a predominance of forest should establish a balance with the natural ecosystem through multicriteria planning that defines specific limits to development, e.g., roads/infrastructure, energy systems, industries, and housing.*

¹²⁶ The literature reviewed supports this view. See: Siripurapu *et al.* 2016. The political ecology of the Forest Rights Act, 2006 – Internal colonialism, the main challenge for democratic decentralization of forest resource governance in India. “Most studies on FRA implementation suggests that there is a conflict between FRA and the existing forest policies and bureaucratic mindset of the implementation agency...The results of the review indicates that the root cause of conflicts in implementation of the FRA 2006 in India might lie in the institutional reforms introduced during colonization of the sub-continent, which continued through post-independence and present India through internal colonialism.” See also: CFR-LA, 2016; Kumar *et al.*, 2017. Other reasons mentioned informally in interviews are economic interests. The FRA is considered a threat by many Indian government officials, especially in the Forest Department (FD). If the FRA were fully implemented, tribal lands representing up to 30% of the total area currently managed by the FD would change jurisdiction, resulting in loss of FD timber revenue. Also, Jharkhand is rich in timber, coal and other minerals and the FRA is opposed by powerful corporate lobbies.

in Table 17) and Community Forest Governance Strategy. The CFRMC are already operating and offenders found guilty of forest violations are obliged to pay a fine to the *Grahm Sabha*.¹²⁷

The IFS/FD does not view the IFA and FRA as inherently contradictory, but rather stresses the importance of conscientiously understanding and fulfilling the FRA process to prevent claims from being denied. Issues between the IFA and FRA will need to be clarified judicially as laws are actively implemented. Training, technical support, and **facilitation to implement the FRA** is needed not only for the villages, but also for the FD, Welfare Department and Revenue Department. A qualified third party (CSO or NGO) to fulfill this role is probably necessary for FRA implementation to succeed. BF would be a likely candidate to carry out this function within the project area.

From a **longer-term perspective**, the Adivasi have been using the forests in their homelands as a source of livelihood for many generations. The preamble of the FRA states that a major purpose of the Act is to redress historical injustices. Realistically, achieving this will require persistent effort that will take at least a generation. Concurrently, to make this possible, it is essential to restore the viability and sustainability of agricultural and forest-based livelihoods.

¹²⁷ The Community Forest Rights Management Committee (CFRMC) is the *Grahm Sabha* legal structure that meets monthly for micro-planning to implement the Community Forest Conservation and Management Plan (required by FRA). The CFRMC is in charge of tasks such as posting signs, updating the biodiversity register, and managing reforestation projects. They also coordinate the economic strategy from managing forest resources such as NTFP, timber, and water. In accordance with the FRA, harvesting of timber is allowed only for needs in the village but not for outside sale or commercial purposes.

See also: Nilsson and Chakma, 2015. The four-tier Community Forest Governance Strategy developed by JJBA consists of the traditional village council (*Grahm Sabha*), a forest protection committee (CFRMC), women's cooperatives (*Mahila Sabha*), and a youth forum (*Bal Akhra*). These four 'pillars' form a self-governance system that combines the *Grahm Sabha* with women's and youth organizations to empower them without depending on the village council.

CHAPTER 4

Conclusions and Recommendations

“A society must be built in which every village has to be self-sustained and capable of managing its own affairs...Independence begins at the bottom.” – Mahatma Gandhi

4.1. Forest Rights Act Implementation and Natural Resource Governance

The **main impediment** for moving forward with the FRA process in the 26 villages where Community Forest Rights were approved is the failure of the DWO of Godda District to provide the official confirming documentation. Regardless of whether due to lack of political will or negligence on the part of government officials, neither should be motive to prevent communities from exercising their community forest rights. The recommendation is twofold, combining the advice of D.K. Sriwastawa and S.B. Mullick:

R.1.1. The *Grahm Sabha*/FRC and BF should advance FRA implementation with careful reading and **following of protocols**. Be meticulous in documentation and registry of all FRA processes, including minutes and photos of their own meetings. Complete copies of all documents presented need to be kept on file. Signed receipts should be obtained from officials whenever documents are submitted, with at least two members of the CFR committee present: one to deliver and the other to photograph as proof. BF should assist the FRC to implement such a system (including by-laws, record keeping, etc.) until they have enough experience to carry on independently.

R.1.2. After submitting their claims, while the government does the paperwork, then the *Grahm Sabha* should begin **asserting FRA rights**: 1) Discussion and formal approval of

the FRA in the *Grahm Sabha*; 2) Placement of signs at strategic locations declaring the *Grahm Sabha* is implementing the FRA; 3) Definition of FRA rules at village level through participatory workshops; 4) Activation of village patrols to protect the forest. Keep relevant government agencies informed during this process. If they do not fulfill their part, notify them in writing that the *Grahm Sabha* will continue exercising their FRA rights.

Advancing the FRA is difficult due to the number of agencies involved and the **complexity** of the process itself. Many villagers are not literate and officials in the FD, Welfare Department and Revenue Department are equally illiterate about the intricacies of the FRA. Training and facilitation between all parties is needed. As per D.K. Sriwastawa:

R.2.1. Designate a third party such as a qualified CSO or NGO to **facilitate** this process between the *Grahm Sabha*, FD, and the MoTA (Jharkhand) as the key entities responsible for FRA implementation, as well as Revenue officers at the District and Block level who have a role in the finalization of titles and update of revenue maps. It should include capacity building, technical support, and vigorous monitoring as required for the process to conclude successfully.

The **Norms of Natural Resource Governance** (see Table 8) were defined with broad community participation and is a solid base for the forest management committees (CFRMC) to start operating. Now an effective organizational structure and mechanisms need to be established. Also, it is a priority to have more involvement of youth in the CFRMC and the *Grahm Sabha* in general. Awareness about the importance of their inclusion for the long-term sustainability of the FRA process has been low and needs to improve.

R.3.1. Socialize and ratify or modify the norms as needed in each village through assemblies of the *Grahm Sabha* to **ensure wide support** and high degrees of compliance. Establish the CFRMC structure/ mechanisms following Ostrom’s Eight Design Principles (see Section 3.6, footnote 83). Enforcement of norms should include not only penalties for infraction but also incentives for desired behavior.

R.3.2. Consider formation of a **youth forum** (*Bal Akhra*) to integrate as a component of the *Grahm Sabha*. Together with the *Mahila Sabha* and the CFRMC, this would form the ‘fourth pillar’ of self-governance for realizing the FRA. (See footnote 127).

R.3.3. Include youth in the CFRMC in ways that are interesting and meaningful to address priority issues that they would like to work on, especially related to the Community Forest Conservation and Management Plan (CFCMP). Provide them with opportunities to attend trainings and events to gain experience and develop their capacities. Include ‘Community Forest Stewardship’ as a field of study in the curriculum of the new Pahal Residential High School.

R.3.4. Incorporate **fun activities** into the meetings of BF with the CFR, CFRMC and/or *Grahm Sabha*. For example, start meetings with some music or a game; have some special food or a snack after the meeting; create incentives to do needed tasks; also include the children whenever possible.

Preparation of the *Grahm Sabha*/CFRMC is needed for them to clearly understand their roles and responsibilities under the FRA and the direct connection with livelihoods. Some villagers have expressed concern that the *Grahm Sabha* may go dormant after CFR title is obtained and should

be made cognizant that getting title is only the first step in a permanent process. Since households earn a significant proportion of their income from NTFPs, it is crucial that community forests be effectively protected and managed to prevent their depletion. The FRA makes the *Grahm Sabha* responsible for the management of forest with CFR title, but they need to be prepared to assume this responsibility.

R.4.1. Conduct a **training process** with the *Grahm Sabha*/CFRMC and BF Field Mobilizers as part of the Community-based Forest Conservation and Management Plan described in the following section. Make explicit the relationships between livelihoods, food security, and forest protection, not only in regard to NTFP but also ecosystem services (especially water) essential for agriculture and meeting basic human needs. Field trips to visit successful experiences would be ideal, if possible.

R.4.2. Training by itself is not enough. *“Only **practical action**, not theory, will be effective for making desired changes in the villages. If there is not the follow-up and personal accompaniment to implement there will be no change. Many government agencies and NGOs come to talk and tell people what to do and to “train”, but they do not come to put into practice. As a result, there are scores of failed ‘white elephant’ projects”* (Betka Hembrom, discussion 20 July 2018).

R.4.3. Develop sustainable **sources of income** to fund the ongoing operation of the CFRMC and forest rangers. Although fees from transit passes to transport NTFPs out of the forest is one source (Forest Department example), it should not be the main emphasis. Rather, learn from the experience of Adivasi initiatives (e.g., Aadhimalai) that thrive from agroforest management and creative marketing of NTFP and ecosystem services.

4.2. Community-based Forest Conservation and Management Plan

As part of the FRA process, the 2012 Amendment Rules to the FRA requires that the rights holders prepare a conservation and management plan (CMP) to assure the sustainable management of community forests. In 2016 the Forest Policy Division of the Ministry of Environment, Forest and Climate Change of the Government of India released the ‘**Guidelines for Conservation, Management and Sustainable Use of Community Forest Resources**’. Although this is an important reference, it is of limited utility for preparing community-based forest management plans due to its complicated text and formats. It also lacks guidance about engaging with communities to develop the plans in a participatory manner, essential for effective implementation.

The [Community-based Forest Management Plan Facilitators Guide](#) ([NIRMAN](#), 2015) is a useful document to address this need. More than just a guide to preparing the CBFMP document, its main focus is on capacity building and empowerment of local communities during the process of developing the plans. The CBFMP has four main purposes: 1) meet the legal documentation requirement; 2) orient participatory planning, learning, and negotiation processes; 3) serve as a technical guide for management planning, implementation, and monitoring; and 4) describe forest governance based on negotiated multi-stakeholder agreements (FAO, 2004).

Management objectives should be based on a specific diagnosis of local conditions, issues, needs, and opportunities. On this basis the management plan is developed for the area, including a shared vision and objectives; zoning to spatially define optimum land uses; and specific programs, projects, and strategies to achieve the objectives. Emphasis should be on improving local

livelihoods through multi-use forest management, particularly on the development of food forest for community nutrition security and local enterprise development. Special consideration must be given throughout the entire CBFMP process to building skills and capacity for community forest governance; and for assuring inclusion of the most marginalized in the community.

Steps to create a participatory management plan include:

- 1) Planning meetings between the community, CSO, and government agencies involved.
- 2) Review of existing information and documentation pertinent to the plan, including policies and any available research on natural resources (biodiversity, soils, forests, watersheds), ecosystem services, agricultural, and socioeconomic data in the study areas.
- 3) Baseline field surveys with participatory community demarcation of boundaries and mapping of forest resources including NTFP, fruit bearing trees, and medicinal herbs. Work is organized in teams of youth (women and men), guided with the help of the *vaidyas* (traditional healers) to build upon the initial information in Appendix 3.¹²⁸
- 4) Workshops with community members about their life situations, livelihood needs and interests, vision for the future, and proposed solutions as contributions to the CMP.
- 5) Formulation of the management plan integrating field and research information described in steps 1 – 4 above, including the initiatives, skills, and ideas of participants.
- 6) Workshops with community members to present and validate the information in the plan, and make any changes needed until it is approved.

¹²⁸ See Appendix 3. Rapid Survey of Forest Species and Indigenous Knowledge. For mapping and data collection tools see: <https://news.mongabay.com/2016/04/participatory-mapping-in-the-mobile-age>; <https://opendatakit.org>. Also: Johnson *et al.* 2006. Facing the future: Encouraging critical cartographic literacies in indigenous communities.

- 7) Meetings with local organizations and government authorities to present and register the plan. If needed, this may include negotiation of agreements with Forest Department and local government agencies.

The following is an **example outline for a Forest Conservation and Management Plan**:

Summary

Background and Legal Status

Planning Process and Methods

Section 1 – Diagnosis

- 1.1. Location: geographic-political-administrative boundaries and extension.
- 1.2. Ecosystem assessment: description of topography, hydrology (watershed), climate, soils, vegetation types, wildlife, domestic livestock, crops and land use, status of indigenous/ traditional ecological knowledge and non-timber forest products (NTFP).
- 1.3. Area overview: population and characteristics; historical background; land tenure; basic services and infrastructure; forest user group details, rights and responsibilities.
- 1.4. Socioeconomic situation: nutrition and food/water security; health and education status and access to services; livelihoods and economic activities; community-based organizations; public and private institutions. SWOT and SINAF analyses.

Section 2 – Management of the Area

- 2.1. Vision and objectives
- 2.2. Agreements, norms, and regulations (see Table 8)
- 2.3. Zoning of land uses (see following section)

2.4. Programs and projects for community forest stewardship (e.g., protection and monitoring, research, education), livelihoods/enterprises, and capacity development.

2.5. Management strategy: organizational structure, roles/rights/responsibilities, administration and reporting, annual operating plan, budget.

References

Appendices

- Maps
- List of participating households
- Species lists with design and management notes
- Benefit sharing arrangements
- Agreements with other communities and institutions

Zoning of land uses is a planning method to improve yield while using less land, time, and energy. By integrating and intensifying production from cultivated lands we can leave more area to forest, watershed, and wildlife habitat (ecological reserves). Zoning helps to define optimum locations for infrastructure (e.g., roads, buildings, fences), crops, and livestock, and to use human labor more efficiently. For example, species and systems that require more visits (more intensive use and management) are located closer to home (Zone 0). The species, elements, and production strategies change in each zone. Table 18 and Illustration 1 indicate relations between zones, site design, and intensity of management.

Table 18. Land Use Zones and Site Design Components

Land Use ZONES	Site Design and Management COMPONENTS
0 – Home/ Workshop	Rainwater harvesting, greywater treatment and irrigation, biogas/ clean cookstoves, seed bank and plant nurseries, biointensive gardens, food processing and storage, organic inputs (e.g., biol, compost) for self-provisioning and local markets.
1 – Home Garden and Nursery	
2 – Staple Crops and Agroforestry	SRI rice polycultures with <i>azolla</i> , vegetables, fish, ducks. Agroforestry and fruit orchards (food forest) with selected varieties integrated with native and leguminous trees/shrubs and small animals (e.g., bees, chickens).
3 – Silvopasture and Rotational Grazing	Intensive rotational grazing/foraging in pastures demarcated with living fence and windbreaks consisting of trees and shrubs that improve the soil, shelter livestock (e.g., cattle, sheep), and provide fruits/ nuts/ forage as supplemental feed.
4 – Productive Forest – Native forest management and/or plantations	Biodiverse production forest or plantations with focus on NTFP such as bamboo (short-term), and reproduction of endangered high value native species for planting, future selective harvest, and value added processing (long-term).
5 – Ecological Reserve – Protection and restoration	‘Sacred forest’ areas conserved as a watershed reserve, wildlife refuge, source of native seeds, ecological reference area, and place for learning and contemplation.

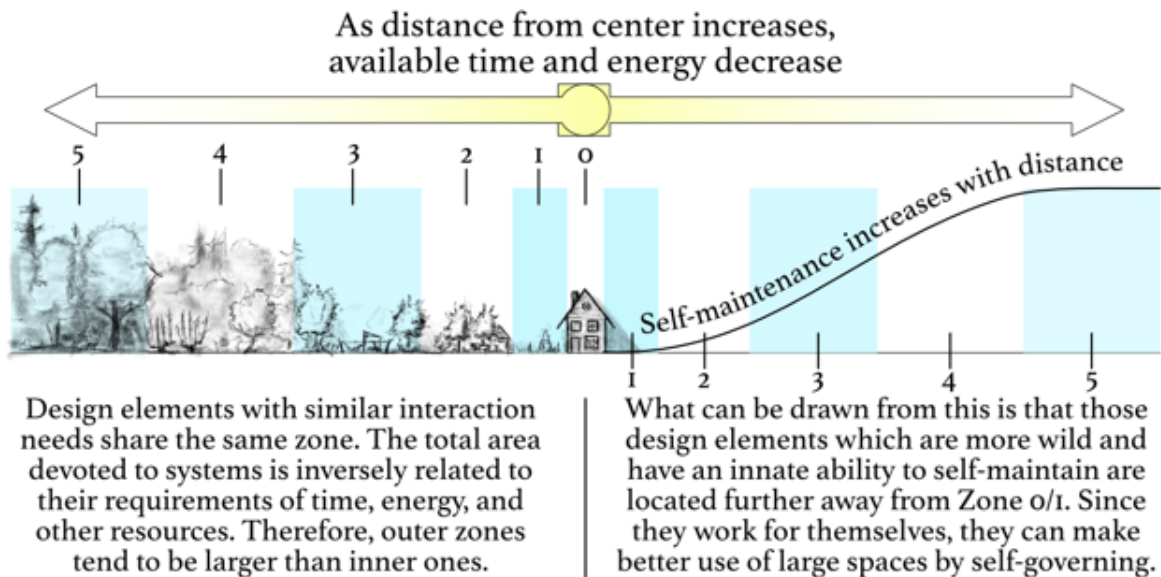


Illustration 1. Permaculture land use zones

Source: <https://permaculturenews.org/2015/12/11/permaculture-zones-of-use-a-primer>.

4.3. Regenerative Agriculture and Forest-based Livelihood Opportunities

Insecure tenure/access to land/forest resources, deforestation, and ecosystem degradation are major causes of poverty and migration. The need to migrate, either temporarily or on a permanent basis, disrupts socio-psychological family and community relationships, eventually resulting in social disintegration and cultural loss. **Transformation of the development model** to an alternative form is required to break this cycle.

Current Degenerative Model: External Input and Credit Dependency (EICD)

Farmers dependent on expensive credit from moneylenders (*mahajans*) + external inputs (seeds, chemical fertilizers and pesticides) + poor resource management/lack of investment = ecosystem degradation + low value added of products + high intermediation = farmers receive low yields and low prices = low income means food and economic insecurity = forced to migrate in search of additional income to survive and pay debts = vulnerability to human trafficking and enslavement.

Alternative Regenerative Model: Zero Budget Natural Farming (ZBNF)

Farmers use no credit or external inputs, all are internal/local + excellent management of resources (soil, water, seeds) = ecosystem regeneration + value added of their products/services + more direct marketing = farmers receive good yields and better prices + no debt = adequate income and food security = no need to migrate + surplus to invest in farm/enterprise/ livelihood improvements in upward spiral toward prosperity and sharing/reinvestment of surplus.

The **alternative model** is based on regenerative management of family farms and community forests as microenterprises organized in cooperatives to achieve economies of scale in production

and access to services and markets. Basic needs (e.g., food, water, sanitation, fertilizers) are provided at household and local level to directly improve health and living conditions, avoiding dependence on toxic and obsolete technologies. With food sovereignty and subsistence needs secured, surplus may be sold in local, online, or other markets.

Local **capacity development** is needed to realize this potential. An ongoing process of practical education based on local and traditional knowledge integrated with the appropriate use of modern science and technology is required. The goal is to increase villagers' capacity to generate improved health and living conditions, employment and income while revitalizing their ecosystems and cultural heritage. By doing so they will support the national development of India, contributing sustainable solutions to some of its most severe environmental and socio-economic problems.

India is one of the eight principal [Centers of origin](#) of crop biodiversity as defined by [Vavilov](#). The Indian Center, including the entire subcontinent, was based initially on rice, millets, legumes, and other economic crops with a total of 117 species.¹²⁹ The list is much longer when including [Neglected and Underutilized Species](#) (Pedulosi *et al.*, 2013; Bhaskar *et al.*, 2015; Frison *et al.*, 2011). Currently, the loss of NUS and of genetic diversity in traditional staple crops is a major biodiversity and food security concern. When the [Green Revolution in India](#) began in the mid-

¹²⁹ Among the species from the Indian Center are **Cereals, Legumes:** rice (*Oryza sativa*), chickpea (*Cicer arietinum*), pigeon pea (*Cajanus cajan*), urd bean (*Phaseolus mungo*), mung bean (*Phaseolus aureus*), rice bean (*Phaseolus calcaratus*), cowpea (*Vigna sinensis*); **Vegetables, Tubers:** eggplant (*Solanum melongena*), cucumber (*Cucumis sativus*), radish (*Raphanus caudatus*), taro (*Colocasia antiquorum*), yam (*Dioscorea alata*); **Fruits:** mango (*Mangifera indica*), orange (*Citrus sinensis*), tangerine (*Citrus nobilis*), citron (*Citrus medica*), tamarind (*Tamarindus indica*); **Sugar, Oil, Fiber Plants:** sugar cane (*Saccharum officinarum*) coconut palm (*Cocos nucifera*), sesame (*Sesamum indicum*), safflower (*Carthamus tinctorius*), tree cotton (*Gossypium arboreum*), oriental cotton (*Gossypium nanking*), crotalaria (*Crotalaria juncea*), jute (*Corchorus capsularis*), kenaf (*Hibiscus cannabinus*); **Spices, Stimulants, Dyes:** hemp (*Cannabis indica*), black pepper (*Piper nigrum*), gum arabic (*Vachellia nolitica*), sandalwood (*Santalum album*), indigo (*Indigofera tinctoria*), cinnamon (*Cinnamomum zeylanticum*).

1960s around 30,000 rice varieties were cultivated; today in three quarters of the country's rice fields only 10 varieties are planted (IPES-Food, 2016).

Regenerative agriculture is a set of land use practices and a growing movement to recover fertile soil and biodiversity, including indigenous seeds and knowledge essential for [food sovereignty](#) (Shiva and Leu, 2018; Wittman *et al.*, 2010).¹³⁰ The following are two notable examples in India.

Navdanya means “nine seeds” symbolizing protection of biological and cultural diversity. It is a network of seed keepers and organic producers that trains farmers and helps establish community seed banks throughout India, and connects them in their [fair trade](#) network. *Navdanya*'s learning center *Bija Vidyapeeth* (School of the Seed) is located in the Doon Valley of Uttarakhand.¹³¹

Zero Budget Natural Farming (ZBNF) 'Zero Budget' means no use of credit or purchased inputs; 'Natural Farming' means farming with Nature and without chemicals. Its proven methods include: fermented microbial culture (*jivamrita*) and seed coating (*bijamrita*) prepared on-site using local cow (*Bos indicus*) dung and urine to promote soil microbe and native earthworm activity; cover crops and mulching (*acchadana*); intercropping; contours and bunds to conserve rainwater; and reduced irrigation to maintain soil aeration (*whaaphasa*). ZBNF has been officially adopted by the government of the State of Andhra Pradesh.¹³²

¹³⁰ See also: <https://regenerationinternational.org/why-regenerative-agriculture>; Toensmeier, 2016.

¹³¹ See: www.navdanya.org/site/index.php; www.navdanya.org/site/living-seed/navdanya-seed-banks.

¹³² See: <http://apzbnf.in>; www.unenvironment.org/news-and-stories/press-release/andhra-pradesh-become-indias-first-zero-budget-natural-farming-state; <https://theprint.in/india/governance/modi-govt-supports-zero-budget-natural-farming-but-doesnt-have-enough-budget-to-promote-it/342570>, but in the same budget (2019-2020) raised subsidies for urea and other chemical fertilizers.

Design of human ecosystems reciprocal with nature (circular economy) are key to regenerating agricultural and forest landscapes and livelihoods, along with human health and well-being. From Mollison and Holmgren (1978), basic **permaculture principles** that orient this process include:

- Create agro-forest ecosystems of high productivity and low energy consumption that optimize efficiency of space, time, and labor. Maximize production in the minimum possible area, especially important given the small holdings of most families.
- Work with (not against) nature. Observe and imitate nature (e.g., the forest) as a model for production, learning from examples such as:
 - nutrient cycling, biomass accumulation, soil cover;
 - layering in space and time; diversity of species, habitats, and microclimates;
 - associations of species for mutual support and higher overall production;
 - transition zones or edges between ecosystems (e.g., forest/meadow/stream)increases the diversity and productivity of the landscape.
- Supply energy needs of the system by the same system (e.g., biogas, solar). Cluster and connect production components so that ‘wastes’ become inputs for other productive processes in the same or nearby systems (zero waste). Obtain high yields with methods economically and technically accessible to practically any person (e.g., ZBNF).
- Integrate agriculture, aquaculture, livestock, forestry, the home and all buildings as productive components of the farm (see Illustration 2). Raise animals in rotational forage systems to eat vegetation not used by people, supplemented with feeds made from leftovers of crop processing. Harvest rainwater and store in tanks, ponds, and constructed wetlands for irrigation, aquaculture, greywater recycling, fertilizer production, and fire protection.



Illustration 2. Integrating components of the farm

Source: <https://permacultureprinciples.com/post/open-source-permaculture-guidebook-for-the-tropics>.

Based on field observations and the results of the SWOT and SINAF analyses (Tables 9 to 15) with the participants, the following are the proposed Regenerative Agriculture and Forest-based Livelihood Opportunities (RAFLO) in the study area (see Table 19). These are organized by permaculture land use zones and prioritize basic human needs (e.g., water supply/sanitation, food security/nutrition, energy, housing, income) starting at household and community level. **Zero Budget Natural Farming (ZBNF)** is included as both as a technical system and farmer movement implementing agroecology at scale (see: Khadse *et al.*, 2018).

Table 19. Regenerative Agriculture and Forest-based Livelihood Opportunities (RAFLO)

Land Use ZONES	Sustainable Living and Enterprise OPPORTUNITIES
0 – Home/ Workshop	<ul style="list-style-type: none"> • Rainwater harvesting, storage, and filtration systems.
1 – Home Garden and Nursery	<ul style="list-style-type: none"> • Greywater capture, treatment (biofilters) and irrigation systems. • Biogas systems (processing of food/crop wastes, animal and humanure). • Clean cookstoves: biogas, rocket stoves and ovens. • Seed bank and plant nurseries of heirloom and native species. • Biointensive gardens of traditional ‘superfood’ vegetables, spices & medicinal herbs. • Cultivation of edible and medicinal mushrooms. • Solar food dryers, crop processing, packing, and storage systems. • Biofactory: production of ZBNF bio-preparations (e.g., <i>jivamrita</i>, <i>bijamrita</i>). • Natural building with adobe, bamboo, hemp, jute/kenaf, ceramicrete composites.
2 – Staple Crops and Agroforestry	<ul style="list-style-type: none"> • SRI rice cultivation and polyculture systems with <i>azolla</i>, vegetables, ducks, fish. • Staple crop associations (e.g., maize, pulse, squash) planted between N-fixing tree/shrub contour hedgerows, windbreaks, shelterbelts, and swales (alley cropping). • Alternate other staple crops (e.g., millets, pulses, potato, sweet potato, lady finger) and potential ‘new’ crops (e.g., hemp, teff) into alley cropping rotations. • Food forest/ fruit orchards, incl. mango, jackfruit, guava, tamarind, papaya, plum, custard apple, banana, citrus + native/leguminous trees/shrubs (e.g., moringa, neem) + small animals (e.g., honeybees and chickens also provide pollination and pest control services).
3 – Silvopasture and Rotational Grazing	<ul style="list-style-type: none"> • Living fence, rotational grazing/foraging and supplement feed systems for cattle, goats, turkeys to improve both pasture and animal health and productivity. • Production of organic fertilizers and fuel from animal shelters connected with biofactory and biogas systems.
4 – Productive Forest - Native forest management and/or plantations	<ul style="list-style-type: none"> • Improve existing NTFP management and enterprises: leaf plate (saal tree); sericulture (arjun/asan trees); fruits (e.g., mahua, amla, bael, jamun), nuts (e.g., bhelwa, charoli), mushrooms, bamboo, palm, neem and other Ayurvedic medicinals. • Bamboo: plant and manage for watershed restoration and sustainable harvest with value-added processing for bioconstruction, handicraft & ecosystem services markets. • Native hardwood ‘pension plan’: collect seeds, reproduce, plant and manage high value species (sagwan, sisam) for future selective harvest, processing, and marketing.
5 – Ecological Reserve - Protection, restoration	<ul style="list-style-type: none"> • Community forest guide/guardians alliance between elders and youth to protect the forest and for intergenerational sharing of knowledge, skills, and traditions. • Baseline inventory and monitoring of forest, watershed, and wildlife status with participation of local schools and visiting researchers, students, and volunteers. • Forest landscape/watershed restoration projects designed and implemented by trained community-based teams with support of strategic allies, clients, and impact investors.

4.3.1. Renewable Technologies and Rural Industries

RAFLO builds on the ‘Potential Livelihood Opportunities’ presented in Section 4.3.3 and integrates renewable technologies and local industries to resolve the interrelated basic needs of **water/sanitation, fertilizer, energy, and building** in a decentralized and sustainable way.

The top examples of large-scale **watershed restoration** are described in four videos about ‘India’s Water Revolution’.¹³³ The *Satyamev Jayate* Water Cup was a contest between villages to install the most water harvesting structures in a 45-day period. Thousands of villages competed from 2016 to 2019 and became the world’s biggest permaculture project. (See videos:

#1. www.youtube.com/watch?v=-8nqnOcoLqE; #2. www.youtube.com/watch?v=jDMnbeW3F8A; #3. www.youtube.com/watch?v=KtHuIfyJao; #4. www.youtube.com/watch?v=KhoV-vBAyFI).

At household scale, **rooftop rainwater harvesting** is a safe and practical solution to supply potable water for domestic use. Under natural conditions rainwater falls clean and if harvested, filtered, and stored correctly it can supply the needs of a family all year long. (See: www.indiawaterportal.org/sites/indiawaterportal.org/files/Room%20Top%20Rainwater%20Harvesting_Presentation_2006.pdf; www.rainwaterharvesting.org).

Greywater treatment with constructed wetlands and biofilters means that precious rainwater can be reused year-round for irrigation of biointensive kitchen gardens for food security. (See:

Small-scale Constructed Wetlands for Greywater and Total Domestic Wastewater Treatment

¹³³ Paani Foundation: www.paanifoundation.in; Development Research Communication and Service Centre: <http://drcsc.org>; Videos produced by Andrew Millison, Horticulture Department, Oregon State University.

https://sswm.info/sites/default/files/reference_attachments/WAFLER%202008%20Small%20scale%20Constructed%20Wetlands.pdf; www.ecosanservices.org; Todd and Josephson, 1996; Tanaka *et al.*, 2011).

Ecological sanitation conserves (rather than wastes) water and recycles human, animal, and food waste into biogas and/or as fertilizer to return nutrients back to the soil. (For main options see: <https://sanitation.indiawaterportal.org/sites/default/files/attachment/EcologicalSanitationHandbook.pdf>).

Human urine processed and used correctly is an excellent (and free) liquid fertilizer that obviates need for urea. (See: www.urbanlab.umich.edu/project/fertilizer; <http://richearthinstitute.org>; <https://modernfarmer.com/2014/01/human-pee-proven-fertilizer-future>).

Biogas provides clean cooking fuel produced from food scraps, manure, and other organic wastes. It is a source of renewable energy replacing LPG/fossil fuels, firewood and charcoal, thereby reducing deforestation. Bioslurry is a biogas byproduct valuable as an organic liquid fertilizer. (See leading example: www.homebiogas.com; www.homebiogas.com/Products/HomeBiogas_Toilet).

Rocket stoves are simple, clean, and efficient. (See: <https://insteadof.com/blog/how-to-build-a-rocket-stove>). So are **Solar cookers**, the **Haybox** cooker, and the **Wonderbag**.

Rural industries produce the infrastructure needed to improve physical conditions for health, quality of life, and livelihood productivity; examples include rainwater harvesting and biofilter/greywater treatment systems, biogas and compost toilets, efficient/clean cookstoves and ovens. Such industries also include **food/ seed processing and storage systems**. Post-harvest processing and storage of crops, fruits and vegetables is needed for food security and marketing of surplus spread throughout the year. The idea is to process and store produce instead of selling all

at harvest when markets are saturated, prices are low, and much is wasted. The preferred option is to market later when the same produce is scarce and commands a higher price. Components include **solar food dryers** for producing dried mango, banana, vegetables, herbs, mushrooms; and **granaries and silos** for storing seeds, grains, and other crops when properly dried.

Natural building makes homes that are seismic and climate resilient, comfortable, energy efficient, and beautiful; as well as animal shelters and fencing, community buildings and infrastructure. All use local materials and craftspeople. Roof areas are designed to serve for rainwater harvesting, solar food driers and/or solar panels. Improved traditional materials and techniques (e.g., adobe, bamboo, wood, stone, wattle and daub/cob) are employed along with newer technologies using bamboo, hemp, jute and/or kenaf composites with ceramicrete.¹³⁴

Bamboo is key as the fastest growing plant and multifaceted building and artisan material.

Hemp is among the earliest cultivated and most prolific multi-use (fiber, food, fuel, feed, etc.) plants with new opportunities opening as mislead prohibitions are lifted in India and worldwide.¹³⁵

Jute is also native to India and is the second most important vegetable fiber after cotton; considered the most sustainable/ lowest environmental impact crop for making textiles and many other uses.

Kenaf is another native multipurpose fiber/ textile plant with properties similar to those of Jute.

Ceramicrete from magnesium-based cement (MBC) requires much less energy to produce and has many other advantages over Portland cement. MBC was the ancient cement of India's stupas that are still standing today. (See: <http://greenhomebuilding.com/articles/ceramicrete.htm>).

¹³⁴ See **Thannal** group doing hands-on research on natural building methods and materials: <http://thannal.com>.

¹³⁵ See: www.entrepreneur.com/article/331292; <https://hemptoday.net/india-hemp-investment>.

4.3.2. RAFLO Concept for Youth and Pahal Residential High School

“The only way to save the next generation is to save the forest” (Villager of Rajabhita, 24 July 2018).

Livelihood choices of youth are key to fulfill the promise of the FRA and will determine the future of the Adivasi and their forests. Most youth are currently engaged in and have their aspirations related to the agriculture and NTFP economy of their own region. Although those interviewed desire improved education, livelihood, and living conditions, they would prefer not to migrate. However, deforestation and land degradation cripples the foundation of the local economy and its ability to provide for current and future generations.

It is essential to create **livelihoods for youth** that achieve food/water security and enhance crop yields to improve livelihoods and avoid the need for migration, while changing from excessive extraction to regenerative management of land, forests, and watersheds. Given the universally stated primary need of water and the small size of landholdings, five areas presented below are proposed as priority for initial development. These are compatible with the skills, interests, needs, and aspirations (see Tables 12 to 15) and the livelihood training, capacity building, and resource needs (see Table 16) identified with youth; as well as the Badlao Foundation ‘future direction’ (see Section 3.7.2).

1) Hydrological design – regenerative watershed management. Water is the key resource. Conventional irrigation systems that further extract from sinking water tables are counterproductive. Earthworks (e.g., swales, ponds, check dams) for rainwater harvesting and storage promotes aquifer recharge to overcome water and food insecurity from unreliable rain and lack of irrigation. (See: www.youtube.com/watch?v=-8nqnOcoLqE).

2) Food sovereignty – biointensive gardening. The top priority, before production for market, is food self-sufficiency with plenty of fresh fruits and vegetables needed to reverse malnutrition. (See: www.downtoearth.org.in/blog/food/why-food-is-about-biodiversity-60602).

Biointensive gardens and nurseries integrate vegetables, fruit shrubs, medicinal herbs, small animals, organic/ZBNF input production, seed banks and plant nurseries, in small, efficient, and highly productive (fenced) areas oriented to self-provisioning and storage for food security and surplus with value added processing for markets. (See: <http://files.meetup.com/2862372/49406341-How-to-Grow-More-Vegetables.pdf>).

3) Staple crop polycultures with SRI and ZBNF. Plant rice in polycultures with *Azolla*, vegetables, fish, and ducks. Multiple uses of azolla include biofertilizer, biofuel, livestock feed, and wastewater treatment (see: <http://theazollafoundation.org/azollas-uses>); also potential to include *Bacopa*. The SRI intensification method is also applicable to other field crops (see: http://sri.cals.cornell.edu/aboutsri/othercrops/SCImonograph_SRIrice2016.pdf; see also about the ZBNF Revolution in India: www.youtube.com/watch?v=vF40gF-PUcs).

4) Syntropic agroforestry. Or ‘regenerative jungle farming’ is to transform wastelands and degrading woodlands into ‘superfood forests’ using a successional multi-strata, slash/mulch agroforestry approach with diverse food, medicinal, NTFP and timber species. Priority is fresh produce for home consumption and processing of dried fruits, pulp, conserves, and medicinals for marketing. Dried mango, banana, and papaya are popular snacks. Also, multiple potential markets exist for processed jackfruit, tamarind, amla, jamun, moringa, and neem, to name a few (see Tables 4 and 5). Use solar food driers and

biogas systems for fruit, vegetable, and medicinal plant processing.¹³⁶ (See example of syntropic agroforestry in Brazil: www.youtube.com/watch?v=ST9NyHf09M).

5) Bamboo for rural industries and forest landscape restoration. Opportunities are growing for green home building and value added products in replacement of plastic.¹³⁷ The public Scheme of Fund for Regeneration of Traditional Industries (SFURTI)¹³⁸ and the private companies [Bamboo India](#) and [Bamboo House India](#) work with bamboo artisans. (For an FLR example see: Greening Red Earth—How can Bamboo help restore land in India? www.youtube.com/watch?v=6UU0ahKBj6Q).

Pahal Residential High School (PRHS) provides a formally recognized education to Adivasi youth in an environment supportive of their cultural identity, including practical knowledge, skills, and income generating activities. PRHS is strategically positioned to empower their students to develop skills and livelihoods in the five areas outlined above. Renewable technologies for water/sanitation, food/nutrition, energy, and building are transversal to all these areas and are needed at the school. The following are main recommendations.

1) Teach sustainability by practical application. This includes on-site design, installation, and operation of systems for rainwater harvesting, greywater treatment for irrigation, ecological sanitation, biogas, solar driers and ovens, food storage, biointensive gardens and orchards, among others. This will provide abundant food, fuel, and fertilizer to sustain the school. Surpluses could be processed and marketed by student

¹³⁶ See: <https://vikaspedia.in/agriculture/market-information/e-charak-platform-for-medicinal-plants>.

¹³⁷ See: <https://indianexpress.com/article/lifestyle/art-and-culture/world-bamboo-day-2019-indias-green-gold-5998641>.

¹³⁸ See: <https://msme.gov.in/scheme-fund-regeneration-traditional-industries>.

microenterprises. Thus, the school would effectively instill livelihood skills needed by students and become a living example of circular economy and sustainable development.¹³⁹

2) Facilitate establishment of a bamboo processing plant and workshop. Most of the bamboo harvested leaves the area at low price with no value added. Meanwhile, processed bamboo and artisanry would be ideal to meet unmet local needs for water tanks, crop silos, food storage, fencing and seismic-resilient building materials including (if possible) roofing for rainwater harvesting.

3) Form students as ‘regenerative agroforester-entrepreneurs’. In their first year or two, each participant would plant a biointensive garden, bamboo grove, and at least 500 AF trees on land under their stewardship. They would be provided with resources and training in cultivation, harvest/postharvest, processing, value chains, and cooperative marketing. The program combines agroecological, entrepreneurial, and technological components to promote Adivasi Agriculture/NTFP in niche markets (e.g., superfood, medicinal, bioconstruction) as a strategy for youth to have a forest future in their own community. By graduation, most of the fruit trees and the bamboo they planted will be near production, forming part of a diversified farm-forest ecosystem that provides the basis to sustain themselves and build a better future.

4) Support formation of experienced practitioners to obtain the complementary skills needed to become trainers, technical advisors, and independent contractors of projects in their villages. (See Tables 13 and 16: aspiration of youth group in Kusmaha).

¹³⁹ For example, the biogas system would convert the humanure of 100 students (now wasted in septic tanks) into cooking fuel that would replace purchased LPG gas. Bioslurry (biogas byproduct) would be processed into organic fertilizers for gardens and orchards on-site with surplus sold in local markets.

4.3.3. Partnerships for Action Research, Education, and Investment

To implement the recommendations outlined above, the Pahal School will likely need to partner with other entities for **action research and technical assistance**. For example, in addition to organizations cited previously, the Department of Science and Technology – Science for Equity, Empowerment, and Development (SEED) Division – Technological Advancement for Rural Areas (TARA) program is a potential source of support for technologies such as ecological sanitation, biogas, and solar energy.¹⁴⁰ [CIBART](#) and [CBD](#) (see footnote 55) support initiatives that contribute to bamboo-based economic development and ecological restoration.

Beyond the focus on livelihood and employment, the Pahal School has the potential to develop an **educational model** based on preserving tribal language, values, knowledge, and skills; and of training tribal teachers to integrate these into school curriculum, while also sharing India’s rich cultural traditions. This fits with the educational philosophy of [Rabindranath Tagore](#), one of the great writers and humanitarians of the modern age, and founder of [Vishva-Bharati University](#). He promulgated non-authoritarian intercultural education accessible to all, with the mother tongue as the medium of instruction, while promoting the importance of understanding other languages and cultures; and especially of learning from the wisdom of the forest.¹⁴¹

¹⁴⁰ See: http://dsttara.in/InnerPages/Core_Support_Programme.aspx, <http://dsttara.in/InnerPages/TARA.aspx>.

¹⁴¹ In his essay Tapovan (‘Forest of Purity’), Tagore wrote: “Indian civilization has been distinctive in locating its source of regeneration, material and intellectual, in the forest, not the city. India’s best ideas have come where man was in communion with trees and rivers and lakes, away from the crowds. The peace of the forest has helped the intellectual evolution of man. The culture of the forest has fueled the culture of Indian society. The culture that has arisen from the forest has been influenced by the diverse processes of renewal of life, which are always at play in the forest, varying from species to species, from season to season, in sight and sound and smell. The unifying principle of life in diversity, of democratic pluralism, thus became the principle of Indian civilization.” See also: www.online-literature.com/tagore-rabindranath/creative-unity/3; Quayum, 2016.

Investment will be needed to establish the RAFLO systems described. Villagers mentioned on several occasions: “*We are the best people for protecting the forest and should be the ones getting paid as forest rangers;...if we had an arrangement for paid work as forest caretakers and tree planters, rotated within the community, we would all be in agreement*”. New kinds of partnership with impact investors and entrepreneurs would make this possible. They could advance multiple SDGs by assisting indigenous and traditional forest dwelling communities to implement the FRA and thrive as the stewards of their forest homelands.¹⁴² The focus of such partnerships would be to create regenerative livelihoods that achieve food, water, and energy security and assure access to medicinal plants, sustainable sources of income, and education suited to their needs, as described above. It would provide seed capital and access to technical support and markets to help them launch their enterprises, especially for NTFP and ecosystem services.

4.4. Future Prospects

The upcoming U.N. Decade on Ecosystem Restoration (2021-2030), together with the Paris Climate Agreement, Biodiversity Convention, and Sustainable Development Goals, appears to bode well for partnerships with IPLC that would be essential to achieve these ambitious objectives. However, alternative models are required to create projects that are participatory, equitable, and reciprocal from the outset. The standard ‘free, prior, and informed consent’ paradigm implies a

¹⁴² RAFLO addresses most of the [SDGs](#) in a decentralized and cost-effective way, especially goals 1) No poverty, 2) Zero hunger, 4) Quality education, 6) Clean water and sanitation, 7) Affordable and clean energy, 8) Decent work, 13) Climate action, and 15) Life on land. It produces favorable returns on investment, sustained yields of ecosystem services (biodiversity, water, carbon storage), and value-added agro-forest products. Investing in rural areas reduces migration and cost of providing more expensive services and infrastructure in already overcrowded cities.

process of convincing IPLC to approve projects that are usually designed without their meaningful participation, if any, and are often contrary to their interests. Emerging impact investor and entrepreneurship movements together with innovative finance and technological initiatives offer hope that ethical and sustainable new models will eventually become the norm.¹⁴³

Our aspiration is that this study will help facilitate partnerships with the Adivasi and their allies for the FRA and regenerative livelihoods to actually happen. Yet there is a glaring fact that cannot be ignored: the enormous chasm between U.N. declarations and the reality on the ground. Despite the Paris Agreement and SDGs, fossil fuel and related industries most responsible for the Anthropocene are accelerating with the aid of growing public subsidies and bank finance (see footnotes 100, 101, 107). As a result, IPLC worldwide -including the Adivasi of India- are the first to suffer the violation of their rights and territories (see footnotes 102, 103, 108, 124). Global corporations are gaining more power over politicians and influence of government policies across nations and in the U.N. itself. The Adivasi cause of forests and freedom and its relation to the future of humanity and the biosphere is primordial and implicates us all.¹⁴⁴ The liberation ideals of Gandhi are as timely now as they were in his day, not only for India but the entire world.

¹⁴³ For example, see the 1000 Landscapes Collaboration (<http://landscapes.global>) and Regen Network (www.regen.network).

¹⁴⁴ See: www.resurgence.org/magazine/article3390-forests-and-freedom.html.

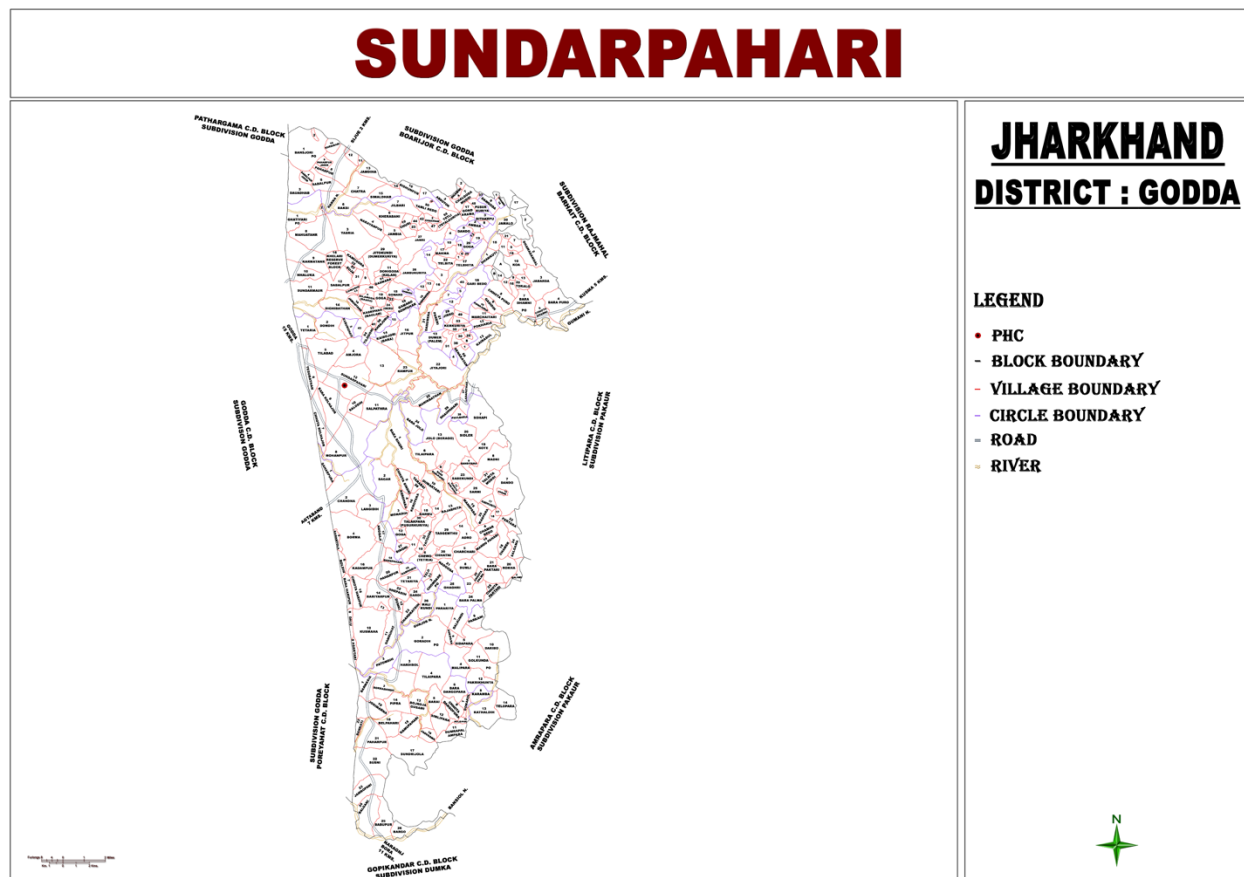
APPENDICES

1. Map of Godda District
2. Map of Sundarpahari Block
3. Rapid Survey of Forest Species and Indigenous Knowledge







APPENDIX 1. Map of Godda District



APPENDIX 2. Map of Sundarpahari Block



APPENDIX 3. Table 1. Rapid Survey of Forest Species and Indigenous Knowledge

Photograph	Species Name	Characteristics	Uses/ Observations
 145	Santhali: Mathkom Hindi: Mahua English: Butter tree, Honey tree Scientific: Madhuca longifolia SAPOTACEAE	A fast-growing tree, usually ~ 20m tall. Adaptable to arid environments but, usually found in tropical mixed deciduous forests.	Flower used to make wine/ liquor to sell in the <i>haat</i> (market). Fruit peel is edible; seeds used to make oil for skin care, soap, vegetable butter; the bark is medicinal; fodder for goats and sheep.
 Chandna Haat Market – 19 July	Santhali: Soso Hindi: Bhelwa English: Marking nut Scientific: Semecarpus anacardium ANACARDIACEAE	Deciduous tree related to cashew, with reddish-orange fruit and a black drupe. The nut is ~ 25 mm long, ovoid and smooth lustrous black.	Accessory fruit is edible and sweet when ripe. Seeds are medicinal, antiseptic, and used to stop bleeding.
 146	Santhali: Kalmac Hindi: Chirata English: Scientific: Swertia sp. GENTIANACEAE	Annual plant, native of northern India, grows in mountainous districts. Root nearly simple, about 7 cm long, stem branched, nearly 1 meter long. Flowers numerous, small.	Leaves and roots are medicinal for stomach maladies.
 Bara Savaikundi – 20 July	Santhali: Baru Hindi: Banyan English: Indian Banyan, Strangler Fig Scientific: Ficus benghalensis MORACEAE	Large tree with very wide canopy important for shade and considered sacred. The national tree of India.	Fruit is edible mainly for birds. Seeds are used to make a medicinal oil.
 Bara Savaikundi – 20 July	Santhali: Baja Hindi: English: Scientific:		Branches are used to boil and eat with sweet potato.
 Bara Savaikundi – 20 July	Santhali: Nehenje Hindi: English: Scientific:		Fruits are crushed and eaten to cure coughs, colds, and throat problems.

Source: Forest walk with villagers of Bara Savaikundi (W.T., M.K., B.H., S.T.) on 20 July and Gardih on 23 July 2018.






Notes: Animals mentioned living in the remoter areas of Rajmahal are: wild boar, wild goat, squirrel, mongoose, porcupine, fox, wolf, monkey, and jungle cats; also, tigers, elephants, and sloth bears until about 25 years ago. Elephants are starting to return to Godda, coming from the northern districts of West Bengal (July 2018).

Source of scientific names of each species found locally: <http://forest.jharkhand.gov.in/Biodiversity/jharplant.aspx>.






¹⁴⁵https://www.google.com/url?sa=i&source=images&cd=&ved=2ahUKEwjA0PjO187iAhXmFTQIHW7cC38QjRx6BAGBEAU&url=https%3A%2F%2Fwww.amazon.in%2FAzalea-Garden-Madhuca-longifolia-Iluppai%2Fdp%2FB07F2M5K5Q&psig=AOvVaw2UsaTy_K_iMs0uQzPfNvOM&ust=1559698439132904

¹⁴⁶https://www.google.com/url?sa=i&source=images&cd=&ved=2ahUKEwi5wamW2M7iAhXuHjQIHQqsC4AQjRx6BAGBEAU&url=https%3A%2F%2Fwww.indianmedicinalplants.info%2Fherbs%2Findex.php%2Fdr-ajayan-sadanandan-s-articles%2F1233-swertia-angustifolia-var-pulchella&psig=AOvVaw2K9sQnY-OgR_QljBKFtD8&ust=1559698545455703

APPENDIX 3. Table 2. Rapid Survey of Forest Species and Indigenous Knowledge

Photograph	Species Name	Characteristics	Uses/ Observations
 <p>Dumartari – 24 July</p>	<p>Paharia: Aleripo Santhali: Pipal Hindi: Bodhi English: Sacred Fig Scientific: <i>Ficus religiosa</i> MORACEAE</p>	<p>Native to India, large tree up to 30 meters, very long lifespan of 900–1500+ years. (Considered sacred by Hindus, Jains, Buddhists. The <i>Bodhi Tree</i> under which <i>Guatama Buddha</i> attained enlightenment is located in Bodh Gaya, Bihar.)</p>	<p>Sacred tree. Medicinal: adventitious roots are crushed and blended with other herbs to cure dysentery and to strengthen the immune system.</p>
 <p>Mr. Hembrom & Barnabus Dumartari – 24 July</p>	<p>Paharia or Santhali: Hindi: Jharkhand English: Barnabus Scientific:</p>	<p>Mushroom that grows on the forest floor.</p>	<p>Harvested for cooking and selling in the market.</p>
 <p>Chandna Haat Market – 19 July</p>	<p>Paharia or Santhali: Hindi: Bans English: Solid bamboo, Calcutta bamboo, Iron bamboo Scientific: <i>Dendrocalamus strictus</i> POACEAE</p>	<p>Tall, dull green-colored bamboo, grows in thickets, heavily branched, closely growing culms. Reaches height of 6–18 m.</p>	<p>For making cots, house frames and rafters, fences, leaves for thatching. Can be used for concrete reinforcement, walls. Tender bamboo shoots are edible, wrapped in leaves, and stored to eat as a vegetable after 3 days. Usually not cultivated, just harvesting from the forest, but some people have planted near their homes.</p>
 <p>147</p>	<p>Paharia: Arahar Hindi: Toor dal English: Pigeon pea, Red gram Scientific: <i>Cajanus cajan</i> FABACEAE</p>	<p>Perennial legume shrub native to India and widely cultivated in tropical and semitropical regions.</p>	<p>Dahl for eating. (Important staple food throughout India and South Asia, also in Africa and much of Latin America. Nitrogen-fixer excellent in association or rotation with grain crops and groundnut.)</p>
 <p>Tarobandh – 31 July</p>	<p>Paharia: Hindi: Aam English: Mango Scientific: <i>Mangifera indica</i> ANACARDIACEAE</p>	<p>Huge native mango tree with height and crown width of about 30 meters that feeds the whole village.</p>	<p>Fruit harvested and eaten by the entire community. Wood is used to make furniture and deadwood for firewood.</p>






¹⁴⁷ https://www.google.com/url?sa=i&source=images&cd=&ved=2ahUKEwiSvrSg2c7iAhW3GTQIHTvTBcgQjRx6BAgBEAU&url=http%3A%2F%2Fwww.tropicalforages.info%2Fkey%2Fforages%2FMedia%2FHtm1%2Fentities%2Fcjanus_cajan.htm&psig=AOvVaw1cZTFhFoQkX6mJmwwtny4J&ust=1559698830416461

Photograph	Species Name	Characteristics	Uses/ Observations
 <p>Tarobandh – 31 July</p>	<p>Paharia: Chirota Hindi: Chirata English: Scientific: Swertia sp. GENTIANACEAE</p>	<p>Annual plant, native of northern India, grows in mountainous districts; stem branched, nearly 1 m. long; numerous small flowers.</p>	<p>Leaves and roots are used for curing stomach problems and is sold in the market in Godda.</p>
 <p>Tarobandh – 31 July</p>	<p>Paharia: Tala Hindi: Tari English: Palmyra palm Scientific: Borassus flabellifer ARECACEAE</p>	<p>Palm tree native to India and SE Asia. The fruit is a hard outer shell with a slightly sweet jelly inside.</p>	<p>Edible jelly fruit and for making drinks. Leaves are used for roof thatching.</p>
 <p>148</p>	<p>Paharia: Hindi: Barbati English: Yardlong bean, Asparagus bean Scientific: Vigna unguiculata subsp. sesquipedalis FABACEAE</p>	<p>Vigorous climbing annual vine with pods about 1.5m long. Soil nitrogen fixer.</p>	<p>Cultivated for its nutritious edible green pods.</p>
 <p>Tarobandh – 31 July</p>	<p>Paharia: Santhali: Jojo Hindi: Imli English: Tamarind Scientific: Tamarindus indica FABACEAE</p>	<p>Evergreen, long-lived leguminous tree; maximum crown height 12-18 meters, prefers acidic soil, drought resistant.</p>	<p>Fruit for home consumption. Also pickled and sold in the market as a vegetable; firewood.</p>
 <p>Tarobandh – 31 July</p>	<p>Paharia: Serifa Hindi: Sitaphal English: Custard apple Scientific: Annona squamosa ANNONACEAE</p>	<p>Small to medium-sized tree native to tropical America ('Cherimoya') brought to Asia by Spanish traders.</p>	<p>Delicious fruit eaten fresh but with a short storage life if not processed. Fruit is good during the dry season but often not in the wet season due to worm infestation.</p>

Source: Forest walk with villagers of Dumartari, Rajabhita (24 July), and Tarobandh (31 July 2018).

¹⁴⁸ https://www.google.com/url?sa=i&source=images&cd=&ved=2ahUKEwiJncyZ2s7iAhUqsVQKH3_A-QQjRx6BAGBEAU&url=https%3A%2F%2Fwww.seedsforafrica.co.za%2Fproducts%2Fcowpeas-vigna-unguiculata-cover-crop-green-manure&psig=AOvVaw2DX7PNDTBocd_W94wc_Ka9&ust=1559699122637286





APPENDIX 3. Table 3. Rapid Survey of Forest Species and Indigenous Knowledge

Photograph	Species Name	Characteristics	Uses/ Observations
	Santhali: Bhel Hindi: Bael English: Wood apple Scientific: Aegle marmelos RUTACEAE	Small deciduous tree native to India and southeast Asia, considered sacred by Hindus. Outer shell of the fruit is very hard and must be opened with a hammer or machete.	Sweet fruit is eaten fresh and made into juice. Good price in the market and keeps for 2-3 weeks at ambient temperature. Bark, seeds, and shells used as medicine for stomach and other ailments.
 149	Santhali: Ber Hindi: Ber English: Indian plum Scientific: Zizyphus mauritiana RHAMNACEAE	Tropical fruit - spiny, evergreen shrub or small tree up to 15 m high. One of the fastest growing fruit trees in India.	Fruit high in Vitamin C. Medicinal for wounds and infections. Ber leaves are eaten by tropical tasar silkworms. Excellent firewood.
 Salodih – 17 July	Santhali: Hindi: Fannas English: Jackfruit Scientific: Artocarpus heterophyllus MORACEAE	Tree native to southwest India. Well-suited to tropical lowlands, and its fruit is the largest tree-borne fruit.	Fruit eaten fresh, also for making pickles by adding salt, vinegar & spices. Seeds used as a vegetable by cooking. Wood used to make furniture.
 150	Santhali: Sakhwa, Sakhua Hindi: Saal English: Scientific: Shorea robusta DIPTEROCARPACEAE	Native to the Indian subcontinent; moderate to slow growing, and can attain heights of 35 m. In wetter areas, saal is evergreen; in drier areas, it is dry-season deciduous.	The main tree harvested for making leaf plates. Used leaf plates are eaten by cattle and goats. Esteemed as one of the most valuable hardwoods. Resin is medicinal and burned as incense. Leaves are eaten by tropical tasar silkworms.
 151	Santhali: Tiril Hindi: Tendu, Kendu English: Scientific: Diospyros melanoxylon EBENACEAE	Native to the Indian subcontinent. It is a long-lived slow-growing tree up to 35m in height.	Medicinal, leaves are used to wrap around tobacco to make Indian beedi (smokes).

¹⁴⁹ https://www.google.com/url?sa=i&source=images&cd=&ved=2ahUKEwjo-rmC287iAhVIMX0KHVX_AoAQjRx6BAGBEAU&url=https%3A%2F%2Fwww.ebay.com%2Fitm%2F20-Graines-Ziziphus-mauritiana-Indian-plum-seeds-%2F263089383359&psig=AOvVaw0Upq6Zl6FfUbyQc78DHqGV&ust=1559699352243988

¹⁵⁰ <https://www.google.com/url?sa=i&source=images&cd=&ved=2ahUKEwii4bP2287iAhVROH0KHxUHBKqQjRx6BAGBEAU&url=http%3A%2F%2Fbeachstonearoma.com%2Fproduct%2Fsaal-butter%2F&psig=AOvVaw3vvzpu3Aaz-6jcmOocM3wL&ust=15596994877423241>

¹⁵¹ https://www.google.com/url?sa=i&source=images&cd=&ved=2ahUKEwiCzYi_3M7iAhUDJzQIHUBwATwQjRx6BAGBEAU&url=http%3A%2F%2Fobo.genaud.net%2Fbackmatter%2Fappendixes%2Fgarden_of_edan%2Fflora%2Fdiospyros.embryopteris.htm&psig=AOvVaw21A-v5JzRUEI4eeChC7yTd&ust=1559699635217698

Photograph	Species Name	Characteristics	Uses/ Observations
 152	Santhali: Hindi: Neem English: Scientific: Azadirachta indica MELIACEAE	Evergreen tree, native to the Indian subcontinent; fast-growing with a height of 15–20m. Drought resistant.	Multipurpose tree with a huge number of uses. Medicinal in Ayurveda especially for skin conditions. Stems commonly used as a toothbrush.
	Hindi: Babul English: Gum arabic Scientific: Vachellia nilotica (<i>Acacia arabica</i>) FABACEAE	Small leguminous tree 5-15m tall native to India, the Middle East, and Africa.	Pods and leaves for livestock fodder. Medicinal. Wood for tool handles and lumber. Twigs for toothbrush.
 153	Santhali: Tarop (?) Hindi: Charoli English: Scientific: Buchanania lanzan ANACARDIACEAE	Deciduous tree that grows in sandy loam soil, commonly found in dry forests of Jharkhand. Seeds are edible, the size of lentils and taste like almonds.	Edible seeds. Leaves and root are used to heal wounds and to treat 'rukhi' red-urine disease . (Charoli seeds used in Ayurvedic medicine.)
 154	Santhali: Jamun Hindi: Jamun English: Black plum Scientific: Syzygium cumini MYRTACEAE	Medium-sized tree. Ornamental and often planted near Hindu temples and esteemed by Buddhists throughout Asia. Related to Clove (<i>Syzygium aromaticum</i>).	Fruit rich in vitamin C eaten fresh and in juices & jams. Also medicinal used in Ayurveda for digestive problems and diabetics. Leaves can be used for livestock fodder and feed for tropical tasar silkworms.
 155	Santhali: Amla Hindi: Emblic English: Indian gooseberry Scientific: Phyllanthus emblica PHYLLANTHACEAE	Deciduous small-medium tree with greenish yellow flowers.	Fruit used in various dishes and to make pickles. All parts of the plant are important in Ayurvedic medicine and of high value in market. Was abundant but now more rare and difficult to get seeds.

Source: Forest walk with villagers of Bariyarpur (H.S., S.M., M.M.) on 1 August 2018.

Note: Other non-native fruit trees observed are: banana, plantain (*Musa sp.*) and guava (*Psidium guajava*). Fruit trees they would like but do not have are citrus (orange, lemon, lime) and coconut. Other medicinal plants mentioned by villagers but that were not found during our brief surveys are: 'karwapatka', 'motamut', and 'ortut'.

¹⁵² https://www.google.com/url?sa=i&source=images&cd=&ved=2ahUKEwj91-253c7iAhXJ6J8KHR_0BkoQjRx6BAGBEAU&url=https%3A%2F%2Fwww.indiamart.com%2Fproddetail%2Fazadirachta-indica-6568786633.html&psig=AOvVaw338fj_iQhXCjQI7UWnDUwM&ust=1559700005627294

¹⁵³ https://www.google.com/url?sa=i&source=images&cd=&cad=rja&uact=8&ved=2ahUKEwiG5tiH3s7iAhUNx58KHbSbAD0QjRx6BAGBEAU&url=https%3A%2F%2Fwww.researchgate.net%2Ffigure%2Ffigure%2F252FA-portion-of-the-inflorescence-panicle_fig2_282954557%26psig%3DAOvVaw3PSPF-y8nDR5-9KVWwEYWV%26ust%3D1559700124835024&psig=AOvVaw3PSPF-y8nDR5-9KVWwEYWV&ust=1559700124835024

¹⁵⁴ <https://www.google.com/url?sa=i&source=images&cd=&ved=2ahUKEwifwra73s7iAhUmjVQKHcKiAD8QjRx6BAGBEAU&url=https%3A%2F%2Fwww.naturalmedicinefacts.info%2Fplant%2FJambolana.html&psig=AOvVaw0wCGrJEMkP27GkkHvUffCT&ust=1559700224209398>

¹⁵⁵ https://www.google.com/url?sa=i&source=images&cd=&cad=rja&uact=8&ved=2ahUKEwiUgOHY3s7iAhWwHjQIHQhBZQEjRx6BAGBEAU&url=https%3A%2F%2Fwww.dalysfruit.com.au%2Ffruit%2F252520pages%252FAmla.htm%26psig%3DAOvVaw1LQZz_YJY-Z29XjabF0ybq%26ust%3D1559700340404626&psig=AOvVaw1LQZz_YJY-Z29XjabF0ybq&ust=1559700340404626

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