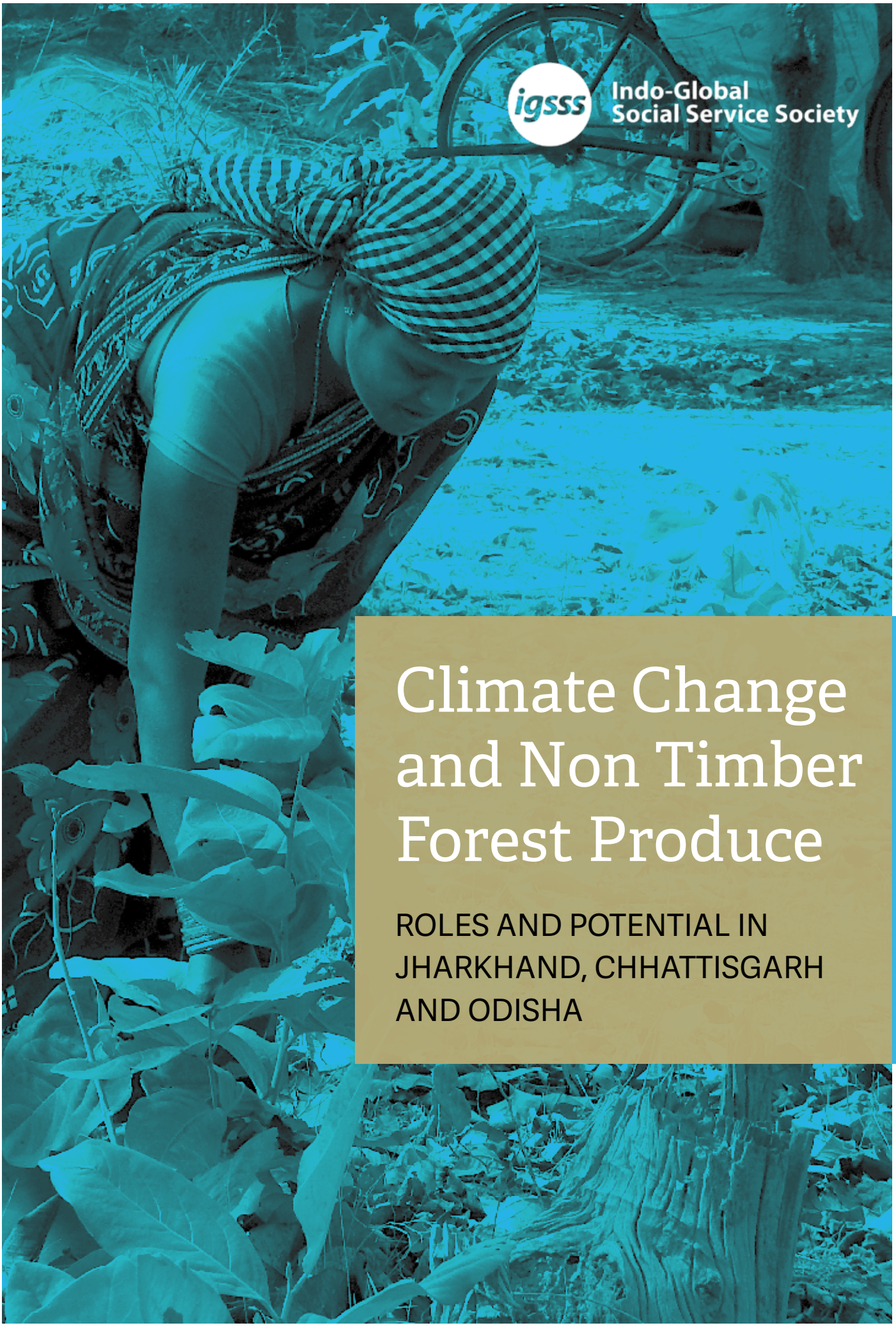

igsss Indo-Global Social Service Society

Climate Change and Non Timber Forest Produce

ROLES AND POTENTIAL IN JHARKHAND, CHHATTISGARH AND ODISHA

Indo-Global Social Service Society

Year: 2015-16

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Indo-Global Social Service Society (IGSSS) is a not for profit development organization established in 1961 to support development programs across India, especially providing services to the vulnerable communities and grass root community based organizations.

Our vision is establishing a humane social order based on the tenets of equity, liberty and justice in which the human rights and dignity of every individual is upheld. IGSSS is an autonomous, secular and apolitical organization and its programs do not discriminate people on the basis of their caste, creed, gender and ethnicity. IGSSS implements and supports quality development programs across 22 States and one Union Territory of India.

IGSSS reaches out to more than one lakh families every year through its programs on sustainable livelihood, disaster risk reduction, gender equity, urban poverty reduction and youth development. The programs at IGSSS are targeted towards the poor, marginalized and vulnerable sections of the society with special emphasis on women and children.

Acknowledgment

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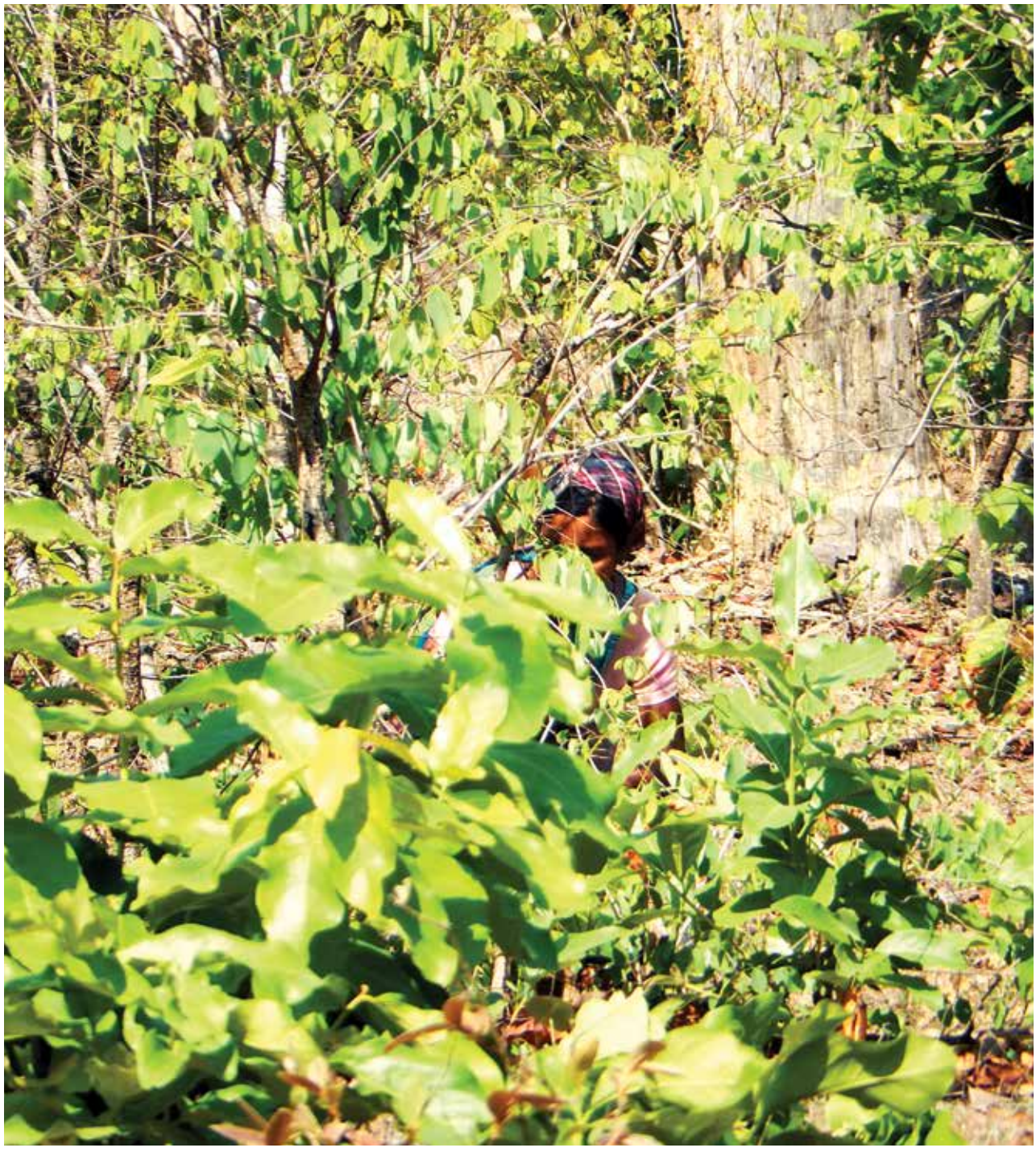

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1 Introduction

The Scheduled tribe communities in India constitute 8.6% of the country's total population (Census of India, 2011), and widely distributed in Central and North East Region of India. In Central India where Panchayat Extension to Scheduled Areas Act (PESA), 1996, implies, have majority of ST population resides and predominantly distributed in the hilly and forest region. Their close association with nature especially forest for their livelihood, traditional agricultural practices, their socio-cultural systems, norms and institutions are well known. The groups own marginal lands where they practice agriculture during monsoon period already facing challenges due to climate variability. These communities are largely dependent on Minor Forest Products (MFPs) for subsistence and cash income. These items include food items (nuts, wild fruits, honey etc.), medicinal plants, building material (bamboo, canes), fuel, fodder and other consumption items. Besides, some produce like tendu leaf, bamboo, Mahua, tamarind, chironji etc. are important commercial items.

The term Non -Timber Forest Produce (NTFPs) are also known as Minor Forest Products (MFPs) or Non-Wood Forest Products (NWFP) and has been defined differently. The definition and classification of MFPs has great significance and affect the policies at state and national level. For instance, Indian rural communities are given usufruct rights and access to naturally fallen branches for the fuel wood however, cutting of wood is not allowed as it is considered as timber and thus belongs to the state. Similarly, the Indian Forest Act defines bamboo as timber and Forest Department has a monopoly over its harvesting and trade. But the Forest Right Act, 2006 classify bamboo under MFP and enables and allows ordinary rural people to manage, harvest and sell bamboo. Another such example lies with the tendu leaves which is a nationalized NTFP and it means that states has monopoly to purchase and sell the item, while tendu has been under MFP in FRA (Forest Rights Act).

The communities rights over access and ownership of NTFPs have been safeguarded though various acts and policies. The Joint Forest Management (JFM) in India provides usufructs like grasses, tops of branches and minor forest produce to the beneficiaries. The Joint Forest

Traditionally, Non Timber Forest Products (NTFPs) refer to all biological materials other than timber extracted from natural forests for human and animal use and have both consumptive and exchange value.

Globally NTFP / NWFP are defined as "forest products consisting of goods of biological origin other than wood, derived from forest, other wood land and trees outside forests-FAO 1999."

All products obtained from plants of forest origin and host plant species yielding products in association with insects and animals or their parts and items of mineral origin except timber, may be defined as Minor Forest Products (MFP) or Non-Wood Forest Products (NWFP) or Non-Timber Forest Products (NTFP)- Mathur R.B. and Shiva, M.P. (1996)

Management committees (JFMCs) formed under JFM can have free access to specified NTFPs in most of the states. The PESA provides ownership right on minor forest produce and other resources to gram sabha/ panchayat. Similarly, the FRA, 2006 has also recognized the rights of forest dwellers and the village councils (gram sabha) over minor forest produce (MFP). The Act provides broader and inclusive definition of MFP ought to increase the number of items over which forest dwellers could exercise their control. However, all these safeguards may not be able to prevent deterioration in the quantity and quality of the gathered NTFPs, or incomes therefrom.

1.1. Importance of NTFPs to the Forest Dwellers

NTFP sector is one of the largest unorganized sector with a business turnover of more than Rs. 6000 crores per annum. In-spite of dependency of more than 275 million population of India (27% of the total) for their subsistence and cash livelihoods (Malhotra & Bhattacharya, 2010; Bhattacharya & Hayat, 2009), the sector is neglected. NTFP contributes to about 20 to 40% of the annual income of forest dwellers (89 million tribal people) and provides critical subsistence during the lean seasons particularly for mostly disadvantageous and landless communities with a dominant population of tribals. Studies conducted in various parts of India including Bihar, Madhya Pradesh, Orissa, and Andhra Pradesh show that the contribution of NTFPs to total household income range from 10– 55% and about 80% of forest dwellers depend on forests for 25 to 50% of their food requirements. Most of the NTFPs are collected and used/sold by women, so it has a strong linkage to women's financial empowerment in the forest-fringe areas. As per an estimate the NTFP sector alone is able to create about 10 million workdays annually in the country (Report of working Group -11 on NTFPs in 12th Five Year Plan, 2011).

MFP sustains 275 million people (Source; Down To Earth, November 1-15, 2010)

Seasons	Types of MFP collected	Economy
January - March	Lac (resin), mahuaflower and tamarind	Over 75 per cent tribal households in Odisha Madhya Pradesh and Andhra Pradesh collect mahua flower and earn Rs 5,000 a year. Three million people are Involved in lac production
April - June	Tendu leaves, sal, seeds, chironji	30 million forest dwellers depend on seeds, leaves and resins from sal trees; tendu leaf collection provides about 90 days of employment to 7.5 million people; a further three million people are employed in bidi processing
July - September	Chironji, mango,mahua fruits, silkcocoons, bamboo	10 million people depend on bamboo forlivelihood; 126,000 households are involved in tussar silk cultivation only
October-December	Lac, kullu gum, resinsused in incense sticks	300,000 person days of employment from collection of gums

A complex combination of climatic, economic and other factors affect the rate of NTFP extraction. Depleting NTFPs either because of diversion of forest land for non - forest use, or due to unsustainable harvesting practices poses another challenge to the food, nutrition and income security of the tribals. Recently, the impact of climate change in forest ecosystem is another challenge widely well recognized (Parmesan and Yohe, 2003; Kirilenko and Sedjo, 2007). There are a few evidences which show climate change is impacting availability, quality and quantity of NTFPs. However, the unsustainable collection practices and forest degradation are main cause of deterioration of these resources. On the other hand, poor R&D focus, inadequate post-harvesting practices, insufficient funds and infrastructure, and unorganized nature of the trade have made it financially vulnerable particularly for the primary collectors. These challenges pose serious threat to the livelihood of the forest dependent community and making them more vulnerable in absence of less opportunity to cope effectively with the adversities of climate change due to low capabilities, poverty, weak institutional mechanisms and lack of access to resources.

1.2. Climate Change and NTFPs

The changing climatic patterns in India, such as increased temperatures and changes in rainfall patterns, is predicted to have strong impacts on livelihood and biodiversity in the country. It is widely recognized that climate change has caused substantial impacts on forest ecosystems by causing shifts in vegetation types, phenology and the reproductive biology of various trees, shrubs and herbaceous plant species and altering the frequency intensity, duration, and timing of fire, drought, insect and pathogen outbreaks (Ravindranath et. al, 2006, Dale et al., 2001, Mukhopadhyay, 2009). Besides these scientific observations and predictions many indigenous communities have observed the changes in terms of phenology, reduction of quantity and quality of produce. The study conducted in Mandla district of Madhya Pradesh highlights villagers observation that since 2005 the tribal communities have observed a significant change in the phenology of local mahua: a gradual shift in fruiting and flowering period from mid-March to mid-February on phonological changes in mahua (Sushant 2013). The shift in the flowering season of mahua reflects a discernible change in the local forest ecology. The study argue that during mid-February, the agricultural season is about to end and farmers are preoccupied with harvesting their produce. Early onset of mahua flowering during the harvest period leaves less time for the community to collect mahua. Another study carried out

in 12 villages of Sheopur District of Madhya Pradesh support climate change impacted on phenology of trees, their flowering, fruiting and seeding pattern as well as pollination pattern got affected (Bhattacharya & Prasad, 2009). Reports on reduced honey collection by up to 90% in Wayanad district, Kerala due to changing climate is reported (Anon, 2011), mahua and mango in Orissa (WWF, 2011) has also been reported.

Studies conducted in elsewhere and India suggests that the rate of extraction of NTFPs is linked to the degree of agricultural stress (Thomas et al, 2011, Delacote, 2007, Illukpitiya and Yanagida, 2010). Since NTFPs have a ready and accessible local market, income from NTFPs helps compensate for lean harvests. Moreover, the typical flowering season of many of the major NTFPs coincides with the agricultural post-harvest period in March. The quantum of agricultural harvest determines the level of NTFPs extraction from the forest. In Mandla district of M.P low agricultural productivity in a drought year forced tribals to extract and sell more NTFPs to meet the food security needs of their households. Thus, in current and future climate change scenario where decline of production of paddy, wheat and pulses has been projected, NTFPs can be looked as potential future strategy to deal with challenges like food, nutritional and income security of the population. Decreasing availability of forest-produce such as food, fuel, medicinal and herbs seem to deprive the rural poor from a supplementary source of income, food and healthcare (Basu, 2009), thus concentrated efforts to understand and assess how NTFPs can contribute to mitigation and adaption of climate change, but also by looking at if and how NTFPs are impacted by changing climates.

IGSSS working with tribal communities in various parts of the country conducted present study in the selected tribal areas of Odisha, Chhattisgarh and Jharkhand. The objectives of the study were to assess the NTFPs contribution to the rural tribal families, challenges, tried to build evidences on how climate change impacting these resources and potential of NTFPs as climate change adaptation and mitigation strategies. Attempt has been made to review available literature on shift in climatic pattern in these three states, communities' observations on the climate variations, impacts on livelihood practices and existing policies to safeguard rights of NTFP gatherers. The study provides suggestions/recommendations to the stakeholders including local people, Govt. agencies and local NGOs working on tribal communities and forest products to manage these valuable produce sustainably.

2 Study Area

The present study conducted in purposively selected villages falls under IGSSS intervention areas i.e. Antagarh block, Kanker District (Chhattisgarh), Bishnugarh block, Hazaribag districts (Jharkhand) and Laxmipur block in Koraput district (Odisha). These states come under the V schedule of Indian Constitutions and falls under the jurisdiction of PESA and FRA.

2.1. Antagarh Block

Antagarh Block is located in Kanker District of Chhattisgarh. It is a hilly, forested track with limited agriculture, mostly paddy. Climate of the region is too hot in summer. It receives 1492 mm rainfall annually, 90% rain fall during the June to October. Temperature varies from 22°C to 47°C in summer months. Gond, Muria and Halba are the main tribes. It is also reputed as largest NTFP market in central/east India. For majority of the population the primary source of livelihood is agriculture, followed by forest produce and then cattle rearing. With about 45.2% of the forest land in district, the region also have the presence of the minor forest products such as: Tendupatta, Sal seed, Harra, Mahua, Tora, Char guthli, lac, bamboo, Amla, Harar, Chironji, Kaniti, Gonda, Dhoop in large quantity.

2.2. Bishnugarh Block

Bishnugarh Block is located in Hazaribagh district of Jharkhand. Its climate is topical, hot, dry or semi-humid and main forests types include Sal and miscellaneous. Rainfall is about 1,400 mm/year and temperature ranges from 10°C to 46°C, making it among the hottest states. The large important products comprise of wood for timber, such as shisham, sal, bargad, bamboo, kusum, gamhar, mahua, jamun, imli, aam,harar, bahera, tendu patta, karanj seed etc.

2.3. Laxmipur Block

Laxmipur Block, of Koraput District in South Orissa forms a part of the central plateau of Eastern Ghats in the east coast of India. The Block is considered as one of the most backward, remote and neglected block in the state. It has drawn the attention of the press several times due to recurring drought and natural calamities. The area is severely risk prone due to recurring deaths during monsoons every year or every alternative year. The indigenous tribe of the area i.e. Jhodia Paraja, Kondha and Domb tribes engage in paddy farming and it is the chief agriculture and livelihood source but its produce hardly suffice for 6 months and hence, NTFP collection or labor work like NREGS is the only other income option here.

3 Methodology

Both primary and secondary data was collected for the study. Primary data was mainly collected through interviews and Focus Group Discussion (FDG), with the households dependent on forest produce and grass root level NGOs working on tribal issue. Information on livelihood practices, agriculture, NTFP availability, distribution, seasonal patterns, contribution of MFPs in household income, marketing mechanism, challenges in NTFP collection and marketing etc. were collected using standardized questionnaires. Concentrated efforts were made during FGD to record perceptions of tribals on climate change and its impact on agriculture, availability, quality and quantity of forest produce. The term climate change was broken into rain, temperature, extreme events, intense storms and related events like frequency of drought, floods and landslides etc. The participants were asked to recall memories of past 10-15 years to describe these events and felt impact on natural and human resources.

Secondary information on MFPs was collected from different sources (research papers, books, journal, reports etc). Information on marketing mechanism of NTFPs exist in different state, policies, available evidence on impact of climate change, rules and regulations and policy framework relevant to NTFPs collected and subsequently linked with the finding of primary data.

4 Findings

4.1. Occupation Pattern of the Target Groups in Study Villages

Interviews with the respondents and group discussion held in study villages in all the three districts show similar occupational engagement of household. Traditionally, rain fed agriculture forms the main livelihood of the families. Land holding pattern show farmers have small patch of land ranging from 1 acre to 5 acre.

This include un-irrigated land mostly use for cultivation of millets and pulses (mandia, ragi, kuthi, kodo etc.).

Only 1-1.5 acre land is used for paddy cultivation with very low productivity. Engagement of tribal in agricultural practices reveals that the months of June to Oct is the busiest month as all the farming operations are done in this period. Raising of nursery of paddy, ragi, tomato and chilly starts in third or last week of June which entirely depends on rain. Sowing of maize, pulses (arhar, urad, kulthi) in upland also starts in June. Transplantation of sapling raised in the nursery into field is heavily dependent on the arrival of monsoon from July to August (mid-week). Farmers prefer to keep the land fallow if transplanting of paddy does not happen by mid - August due to delay/ inadequate rain. Also, volume of production affects if transplanting is delayed. Mostly families undergo 90 days paddy, however, some families cultivate short duration (60 days) paddy. Those who have wetland or irrigation facilities cultivate long duration paddy (120 day). A few families who have access to irrigation undergo cultivation of green pea, potatoes, garlic, bean and other vegetables in the month of November. After harvesting of paddy and millets in Oct-Nov the field lay fallow till June next year in absence of irrigation facilities. During agricultural stress period and non-farming months families depends on collection of forest produce and labour work under NRGEGA for food security and income generation.

A brief occupational profile of the surveyed villages is as follows

Table 1. Occupation of the Respondents Covered Under the Study

Village/Block/District	Occupation	Main NTFPs	Average annual income(Rs.)
Antagarh Block, Kanker (Chhattisgarh) n=51			
Amabeda, Kadampara, Chicgaon,	Agriculture - Paddy farming in monsoon season, NTFP collection, labour work under MGNREGA, emigration to cities seasonally	Tendu leaves, mahua flowers, sal seed, tamarind fruit	25,000-30,000/-
Hazaribagh (Jharkahnd) n=55			
Birhor-tanda and Budhachach	NTFP collection, Agriculture-Paddy farming, manual labour, rope making from cement bag	Mahua flower, Sal seed, Bamboo	20,000/-
LaxmipurBlock Koraput (Odisha) n=37			
Niraniguda, Jhodikenda and Madamdara	NTFP collection, Agriculture-paddy farming in monsoon season, labour, migration	Siali (Bauhinia vahlii), mango, reed grass, brooms, tamarind, kusum fruits	25,000/

4.2. Climate Variability and Linkages with Occupations-Communities Observations

People understand climate change in terms of access/deficit rains, increased temperature, short winter and associated impacts on their livelihood and natural resources. It varies from scarcity of water, drying of surface water bodies, deseeding water level in the wells, to excess/heavy rain in short duration, destroying of crops and flowers of forest species especially in the month of February to April due to hailstorm, heavy rain and thunderstorm. In response the villagers make some quick fix arrangements towards the loss and move on. This is one of the reasons for livelihood resources and systems becoming largely unsustainable by the day and hence more vulnerable to the climate variability of the present as well as the future. A compilation of villager's perception gathered during group discussions on normal weather pattern, climatic variability and associated linkages on livelihood practices are given in Table 2.

1. Rain in early June is considered good for short duration paddy (rain fed paddy 60 - 90 days) and millets too. Farmers having access to stream irrigation (very small percentage) do 120 days paddy, transplanted in August. Paddy is harvested in October to December.
2. Light rain distributed throughout the months help getting bumper crop of millets
3. Varieties of millets, pulses and oilseeds are sown in June, July and harvested through October to December
4. Intermittent rain is considered sufficient, as other than paddy standing water is not preferred for rest of the crops (they need moisture)
5. Rain usually exit around 1st week of October
6. Heavy rain is not preferred after sowing (it would wash away tiny seeds of millet in the slope land) and during harvesting

Table 2. Climate Variability and Livelihood- Communities Experience

Indicators of change in climate variables	Changes/deviation observed by the community	Impacts
Rainfall pattern		
Late arrival of monsoon, uncertain rain-deficit/ excess or scanty rain	Normally monsoon reaches by June last week and continues till October-November. Currently arrival of monsoon rain is uncertain	Late arrival of monsoon affects land preparation, sowing of paddy and millet is delayed and production decreases. Untimely rain destroy standing crop and harvested produce
	Excess- rain for few days at the time of seed sowing	The seeds sown in barren slope without soil work gets washed away at early stage (especially in the hilly tract of Laxmipur Block where shifting cultivation is practiced) Gully erosion, land side, ridges of the agri land are washed away
	Previously, July - August months received good amount of rain fall but currently scanty/deficit rains are there	Difficulty in transplantation of paddy. If by mid-August no or scanty rains than farmers leave paddy field fallow
	Untimely rain (for few days) especially at harvesting time (Oct/Nov)	Resulting in crop loss. Use of hybrid seeds is increasing owing to uncertainty in rain - perceived to have better adaptability.
Winter pattern		
Late arrival of winter	Earlier, winter use to start from September last week but in last few year feeling of winter starts only in November	-
Very cold	Excessive cold for a few days in December and January. However, day temperature is comparably warm	-
Increase foggy days	Increase in foggy days in January	In some years one of the major cash generating pulses, Arhar is badly affected in flowering time, farmers are not even able to recover seeds
Summer pattern		
Temperature	Rise in day temperature starts from February first week, extreme hot in April, May and June. Overall increase in day temperature round the year	Wage earning is affected, Drying of surface water bodies and drinking water shortage
Pre-monsoon shower	Decreased cases of shower in April and May (Reported by respondent of Koraput)	Drying of surface water bodies and drinking water shortage
Unseasonal rains	Unseasonal rains during spring/ summer	Impact on flowers of forest produce like mahua

4.3. Dependency of Tribal on NTFPs in the Study Villages

The minor forest produce provides employment to the families round the year. Currently, uncertainly in weather parameters resulting into loss of agricultural productivity (as reflected in the above table) hence to compensate the loss rate of livelihood from crop production, extraction of NTFPs increases by the families. NTFPs have been considered as Common Property Resources (CPR) and available in forest areas. The commonly found NTFPs in the study area are - tendu leaves, sal seeds, mahua flower and seeds, amla, harra, gum, lac, tamarind, mahul leaves, etc. Besides these, several important medicinal plants are also found in the forests (A list is attached as Annexure 1). A few such produces (mahua, tamarind and kusum tree) are also found in the individual land which is harvested by the family owning the land. During the season of collection, the tribals including male, female and children collect the produce from the forest. The collection and quantity depend on the availability of NTFPs. A majority of species is available during the month of April to July. For collection of NTFPs, villagers including tribal women and children go deep inside the forests and cover long distances ranging from 3-10 km. The tribal women give more time for collection and processing of produce (drying and storage of kendu, Siali, Sal leaves and seeds). The commodities are used for self-consumption and sale depends on quantity. The average income and unpaid employment generated through NTFPs based self-employment for the surveyed population in the area varies from Rs. 2812-6600 household/ annum, this play an important role in the livelihood support. This contributes 25% (villages in Koraput), 30% (Kanker) and 40% (villages of Jharkhand) of annual income of surveyed families.

A few insights on major NTFPs collected from the study villages are

- Mahua–the tree grows in forest and agricultural field area. Per family have average two to three trees. One tree yields about 10 kg of dry flowers which is sold @ 32Rs/ kg. Oil is extracted from Mahua fruit used for self-consumption and for selling as well.
- Tendu leaves are collected by most families; each family collects average 200 bundles in a season. One bundle comprises 100 leaves sell @ Rs. 80/- to 100/-
- Tendu fruit is collected and sold. Each family collect average 03 basket (dalia) and one dalia contains 20-30 kg/- Rs.12/-kg
- Sal fruit-families collect average 4-6 tins and sale @ Rs 50 per tin. The oil extracted from sal seed is utilized for cooking, lighting and massage purposes and the residue oilseed cake is utilized as cattle feed
- Amla- 25 to 30 kg average per family collection and sale @ Rs.12/kg. Also used for self-consumption – make pickle, use on hair
- Kachna rand chirul flower, bhelwa fruit and genthi are important vegetables for the local population for self-consumption and also sold by quantifying them in handful (Kheja) basis in local haats.
- Kusum and karanja seed is collected for self-consumption for extracting oil consumed in

cooking, lighting or lubrication and the residue oilseed cake is vended as cattle feed. The oil has medicinal /therapeutic use and sale in market for Rs. 40/-kg.

- Bel, Ber, Jungliaam (wild mango), Jamun fruits and Mushroom (phutko) are eaten for supplementing nutrition and health. These fruits are also sale in local market (Jamun - sale in dona – leaf cups- /Rs. 2, Jungliaam (wild mango) –Rs.6/ Kg, Ber - Rs. 5/kg, Mushroom (phutko)-Rs. 4-5/ kg)
- Bamboo shoots (dry@Rs100/-kg and raw (karid) @Rs. 20-/kg sale in the local market. On an average one family sale average 20 kg/- of bamboo shoots. The bamboos are priced for its multifarious uses like, young culms (Karla) for pickle, culms for brooms, baskets, fans, sieves, fish trap, plates and other handicrafts making, sticks, huts, tool handles, fishing rods, hunting materials making etc. in the area
- The harra and bahera fruits are important constituents of well-known medicinal composition 'Trifala' and as such the fruits are being collected and sold by the primitive societies traditionally in the area.
- In Laxmipur block the tribal mostly collect, wild mango tubers, siali leaves and broom grass from the forest for self-consumption and selling in local market.
- In Jharkhand, recent changes have benefitted the women who weave ropes from plastic gunny bags bought from traders and sell at double the price (Rs. 20/- kg) of the forest grass ropes they made.

4.4. Seasonality of Collection of Important NTFPs in the Study Area

The seasonality matrix of collection of NTFPs developed during group discussion presented in Annexure 2. The matrix reflects that villagers depend on fuel wood and fodder round the year, however, major NTFPs are available for around 3-4 months. Dependency of tribals on NTFPs in rainy months (July, Aug, Sept and Oct) is least, only a few items (sitafal, chiraita) is collected during this season. This is because of dependency of families in farming activities in monsoon months across the villages. Also, absence of proper storage facilities prohibit villagers to collect the items from the forest. Summer, spring and autumn seasons witness a large quantum of NTFPs influx in the sample villages.

4.5. Ownership and Marketing of NTFPs - Mechanism, Constrains and Challenges

4.5.1. Ownership of NTFPs

As mentioned earlier that the FRA and PESA provide rights to access and ownership of MFPs to the panchayat and gram sabha but different State Acts and regulations control the use and trade of MFPs. There are variations in items considered and MFPs in these people centric acts and state acts. For instance, the state acts give monopoly to the state for purchase and trade of bamboo and tendu; however, the FRA and PESA consider these items as MFP and enable local community to access and control over it. The commodities defined as MFPs in FRA and PESA has yet to be reflected in relevant State regulations. Also, there should be sensitization of grass-root level organisations dealing with tribal issue (supporting indigenous communities to access land patta, individual and CFR claim) to facilitate and capacitate Forest Right Committees, gram sabha, gram panchayat and other community based organisations to access, control and manage these valuable resources.

Table 3. Ownership of MFPs in State Acts

Name of State	Panchayat Act	Subject Act
Andhra Pradesh	Ownership with GPs	State monopoly
Madhya Pradesh	No provision	Powers with State Government for tendupatta to appoint agents for collection and marketing
Maharashtra	Ownership with GPs for 33 MFPs, excluding national parks and sanctuaries	Monopoly with MSCTDC
Jharkhand	GPs and Panchayat Samiti to manage	Control of State Government over tendu
Orissa	GPs to perform functions as prescribed	MFP policy provides for management by Panchayats for 69 items, excluding bamboo and tendu
Gujarat	Ownership with GPs except for MFPs found in National Parks or Sanctuaries	Gujarat State Forest Development Corporation has control over nationalized MFPs.
Rajasthan	Gram Sabha has power to manage MFP	Powers with State Government
Chhattisgarh	No provision	State Government can appoint agents for collection and marketing of tendupatta.
Himachal Pradesh	Ownership with GPs	State Government has power to appoint agents

Source: Report of the Committee on Ownership, Price Fixation, Value Addition and Marketing of Minor Forest Produce, Ministry of Panchayati Raj, Government of India, New Delhi, May 2011

4.5.2. Marketing of NTFPs

Petty traders, small and big traders, wholesalers, commission agents etc., involved in the MFP marketing where each retain a share of the profits. In the study villages marketing of the NTFPs is predominantly done at individual level and majority of the NTFPs are sold in the raw form without any value addition except in few cases (for example the tendu leave sold after drying). In lack of storage facilities and limited value addition and processing skills and facilities, collected forest produce is being sold in the local market. The primary gatherer is often aware only of a village level trader, and simply does not know the price in bigger markets. Also, the quantity of NTFPs at family level is not sufficient to mobilise them to visit large wholesale markets. Some petty traders purchase the forest products directly from the villagers, visiting their homes or villages at a regular intervals and season time.

State government has been involved in purchase and sale of the items included under nationalized items and non-nationalized items as well. These mechanisms gives several justifications including- returns to the collector, sustainable extraction and revenue to the state. In most cases, the state-owned institutions such as state forest development corporations, federations, and cooperatives control trading. In Chhattisgarh, Odisha and Jharkhand State level agencies are involved in trading of NTFPs.

In spite of several mechanisms is in place for marketing of NTPFs but the primary gatherer faced exploitation from middle man. Delay in payment from the govt. agencies is quite common which forced villagers to sale the item in local market to get timely money. In remote villages of Chhattisgarh, Odisha and Jharkhand local shopkeepers exchange many commodities like barks, lac, medicinal plants, resins and oilseeds for salt, tobacco, cloth, umbrella and other goods. In many villages barter system where nominal money is given in advance to the collectors which also lead exploitation of collectors (they are forced to sell the collected produce at very low price). There are many NTFPs like chironji, pattal (tendu and siali), mango, tamarind etc. available in plenty which can fetch good prize at village level by the primary collectors. The items collected for self-consumptions like sal and karanj seed taken to the nearby town for oil extractions using machines. In the study area the largest whole sale market is located in Dhamtari where products from Andhra Pradesh, Odisha, Koraput and

Table 4. State Agencies Involved in Trading MFP

States	Other MFP
Chhattisgarh	Tendu leaves- Chhattisgarh State Minor Forest Produce (Trading & Development) Co -operative Federation Ltd Bamboo - State Forest Department Other MFP- The Chhattisgarh State MFP Corporation has monopoly rights over nationalized MFPs, i.e.Sal seed, harra and gum. Non-nationalized MFPs are directly purchased by the contractors from tribals. The Federation also fixes the prices of these MFPs but has no way of ensuring that these are followed by traders.
Orissa	Tendu leaves - Orissa Forest Development Corporation and the Forest Department Bamboo - Orissa Forest Development Corporation and the Forest Department Other MFP- Purchased by private traders. Prices are fixed by the Block Panchayats. Traders have to register with the Gram Panchayat and pay registration fees of Rs. 100.
Jharkhand	Tendu leaves - Jharkhand State Forest Development Corporation (JFDC) Bamboo - At present no extraction of bamboo is taking place. The extraction would be taken over by the JFDC subject to the approval of the working plan (which is yet to be submitted by the State after making suitable amendments as directed by the Centre) Other MFP- Free markets. JHAMFCO bought imli, chironji, mahua and dori at a Minimum Support Price without monopoly last year.

Source: Report of the Committee on Ownership, Price Fixation, Value Addition and Marketing of Minor Forest Produce, Ministry of Panchayati Raj, Government of India, New Delhi, May 2011

Jharkhand come. Besides, The Tribal Cooperative Marketing Development Federation of India Limited (TRIFED) purchase items like imli, chironji from the collectors. At state and cluster level Laghu van upaj samilit is there which procure tendu, sal, harar, bahera, imli, lac and dhoop.

Different Govt. and non-government organisations advocated for Minimum Support Price of NTFPs. With the result, recently, Ministry of Tribal Affairs (MoTA), Govt. of India has identified 12 different MFP under the scheme 'Mechanism for Marketing of Minor Forest Produce (MFP) through Minimum Support Price (MSP) and Development of Value Chain for MFP. This scheme has been implemented in States falling under Fifth Schedule of the Indian constitution i.e. Andhra Pradesh, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan and Telangana. Interaction held with the grass-root level organisations reflects that these organization are aware about the marketing mechanism but not aware about MSP scheme.

Table 5. The MSP Scheme is initially covering all non-nationalized / non-monopolized MFPs from the 12 main identified MFPs as follows

S.N.	Item	MSP declared by the Government (Rs/Kg)
1	Tendu	-
2	Bamboo	-
3	Mahua Seed	22/-
4	Lac	Rangini-230/-, Kusumi-320/-
5	Myrobalan	11/-
6	Gums (Gum Karaya)	108/-
7	Sal Leaf	21/-
8	Chironjee	100/-
9	Tamarind	22/-
10	Karanj Seed	21/-
11	Sal Seed	10/-
12	Wild Honey	132/-

4.6. NTFPs Availability, Climate Change and Other Factors- Respondent Experience

While discussing about observation on status of NTFPs and impact of climate variability on availability, quality and quantity of the forest species with the villagers and respondents, a few insights were generated. However, most of the responses were towards unsustainable harvesting and forest degradation. Some major reasons of decline of NTFPs flagged by the tribals are grouped into climatic and other factors:

4.6.1. Climatic Factors

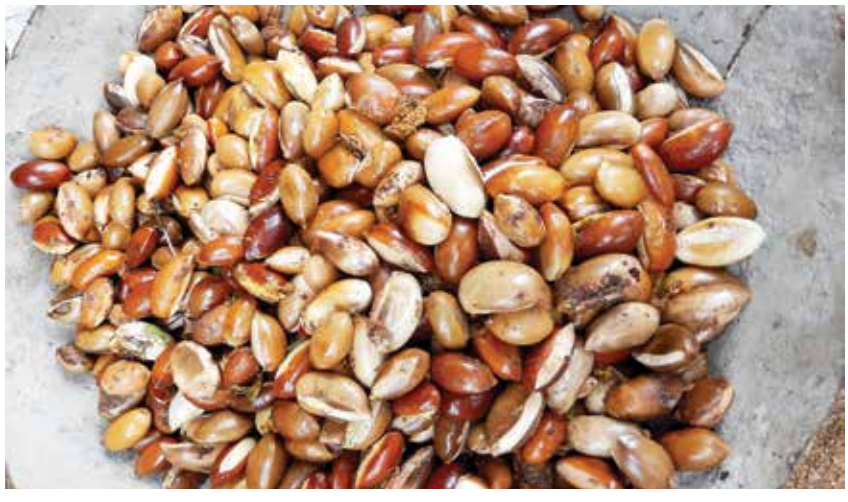
Mahua is an important commodity in villages of Jharkhand and Chhattisgarh. January-February is important phase of formation of kunchi (early stage of bud) and March and April is important months for the flower collection. The initiation of bud affects due to excess cold in January-February. Rain, thunderstorm and cloudy weather during harvesting time makes the flowers drop prematurely or destroys flowers, and some flowers turn upward and do not even fall. Also, cloudy weather at times poses a great problem with the mahua flower not being dried properly. It loses its colour and turns black and also prone to insect infestation and fetch low prize in the market. The tribals in Odisha shared their observation of less availability of different local mushrooms if there are cases of less and scanty rain during monsoon months. The tribals in Chhattisgarh and Jharkhand indicated towards decline of lac and gum due to high days. Various studies also highlight the impact of changing climate on availability of NTFPs in the forest. For instance, climate change reduced the honey collection by up to 90% in Wayanad district, Kerala (Anon, 2011), reduced lac yield by 8% per year from 2007-11 (Indian Lac Research Institute - Jaiswal and Singh, 2011), mahua and mango yield is also known to have reduced due to climate change in Orissa (WWF, 2011).

In the climate change regime the reducing emissions from the forest and land use sector has been considered as one of the most promising climate change mitigation strategies all across the globe. Traditionally, the protection and conservation of forests has focused on timber and trees, particularly with regards to policy making, research and the development of mechanisms (INBAR Working Paper No. 74). In spite of the fact that the declining production of NTFP is a very serious problem for forest communities, as well as for maintaining biodiversity, the regeneration of NTFP has attracted very little attention. Various afforestation programmes in India mainly focus on plantation of timber and gives ambitious task to forest department to increase forest cover of the country. The large scale plantation of fast growing timber yielding species thus remains a prime focus. On the other hand the slow growing NTFPs do not fetch required attention.

4.6.2. Other Factors

Tribals mostly shared their views on reducing the quantity of forest produce in past 2-3 decade due to loss of forest area due to diversion of forest land for agriculture and development project like road, dam etc. The degradation of forest due to shifting (podu) cultivation practice in Koraput has reduced the NTPFs population in last 15-20 days and hence affected income of the tribal people. Besides, destructive harvesting practices like cleaning and burning of forest floor at the time of mahua flower collection causes forest fire hence destroying bio-diversity in various parts of Kanker as reported by the respondent. Monoculture of commercial species like teak, sal, eucalyptus etc. under different plantation schemes to increase forest cover have also reduced NTFP availability.

The villagers responded for need of conservation and sustainable use of NTFPs for their survival. Nearly, 50% respondents recommend NTFPs management as part of village development micro-planning. The urgent need of providing training capacity building of primary collectors on value addition and in good collection practices was shared by 47% respondent, 67% respondent strongly recommended regeneration of NTFP species in forest, nursery raising of some promising species and plantation at individual and community land.



5 Conclusion & Recommendations

Likewise other tribal areas, the community in Kanker, Hazaribagh and Koraput have also been facing challenges emerged due to climate variability and change. While rainfed agriculture in small and marginal land is the main livelihood practice, the NTFPs provides subsistent food, nutrition and income security round the year. The fluctuation in rainfall pattern over the year and during monsoon season, higher summer temperature and long dry period are impacting the livelihood resources, hence the food security. Any agricultural stress leads to over exploitation of NTFPs for the forest. The study records the availability of nearly 30 NTFPs from the study area. The tribal of Kanker and Hazaribagh collects good quantity of MFPs namely, tendupatta, mahua, ber, harar, bamboo, sal seed, lac, tamarind etc. The tribals of Koraput collect wild mango tubers, siali leaves, mushroom and broom grass in large quantity.

The traditional shifting cultivation practice in Koraput has destroyed the forest area over last two decades. In all the villages, forest based livelihood mainly revolve around collection, processing and utilization or selling of various NTFPs throughout the year. The NTFPs sectors in these areas are also largely unorganized. Many petty, small and large traders are involved in purchasing and trading of MFPs. Exploitation of primary collectors from local shopkeepers and small traders, lack of market related information, lack of value addition and processing facilities in the area resulted into low economic status of the household. There are various state and national level law and regulation exists which claim better return to the gatherer but delay in payment from govt. agencies forced tribal to sell their produce in local market at cheap prize. The FRA and PESA provides ownership rights over access and use of MFPs but the state laws gives monopoly to the state for trade of NTFPs. While recording observation of tribal on impact of climate change on NTFPs very few cases has been sited (destroying mahua flower, low lac production, decline mushroom diversity etc.). However, most responses of decline of NTFPs were towards, unsustainable harvesting practices, forest degradation, large scale plantation of fast growing timber trees under forestry programmes etc.

Some of the suggestions proposed during discussion with the tribals include, micro-planning, capacity building on scientific collection practices, skill building on value addition, infrastructure support, regeneration and domestication of NTFPs. Based on the suggestions received by the communities in all the study villages, civil society organization working in the villages, review of literature and policies studied recommends following suggestions to preserve these valuable resources and building resilience to deal adverse effects of climate change.

The tribal community contributes to the NTFP sector as main gatherers thus; their remunerations from their produce, their benefits should be protected legally. The rights claimed over NTFPs, how the forest communities utilizing the law to access and control over natural resources with sustainable harvesting needs to be properly understood and documented while ensuring proper implementation of FRA/PESA. However, the capacity of traditional institution to involve in marketing and fixing prize will remain a challenge. Livelihood enhancement interventions for any of these communities, thus has to begin with a thorough understanding of the types, amounts, availability and processing/storage/marketing methods of the major NTFPs in their region. Also, the same NTFP might have different issues/constraints and market dynamics associated with it in different regions. So, it is important to analyse NTFP related issues not only at the state/regional level, but also at micro-level i.e. at village/cluster levels to get a clear understanding of the issues, the value chain and the potential for commercialization and income enhancement.

Recognizing NTFPs as potential adaptation and mitigation strategy to deal with the climate change and building resilience of resource poor tribal the study recommends following suggestions:

5.1. Regeneration of NTFP Species in the Forest Area

Regeneration and plantation of trees that produce valuable NTFPs, such as tamarind, mahua, chaar *(Buchanania latifolia),* and medicinal trees like aonla, karanj *(Pongamia pinnata),* should be on focus under the various afforestation programmes. As a part of mitigation measure, focus should be given to raise bamboo plantations in community wasteland.

5.2. Infrastructure Support for Value Addition, Processing and Storage

Processing before marketing based on market study and contracts is key to the success of any enterprise, NTFP being no exception. Work shed, low cost machinery like cutter, powdering machines, sieve, weigh-scale, packing-bottling machines, and basic testing laboratories are necessities at each block. Centres like Krishi Vigyan Kendra (KVK) can work towards making this a reality in districts across India. Chironji/imli and mahua, which are locally available, should have a processing and storage centre at the village level.

5.3. Domestication of NTFPs in Individual Land

Amla, Harara, Bahera, and other medicinal plants at individual or community level can be grown. Community nursery of NTFPs and plantations in forest and community land should be promoted.

5.4. Small Scale Enterprise Development

The availability of kusum, ber and palash trees in the individual and forest land provides an opportunity for lac cultivation. As per a rough estimate tribal family can get Rs. 1 Lakh/year through lac cultivation on just a few Kusum trees. Also, the rich diversity of flowering plants in the area can support honey cultivation and processing.

5.5. Collectivization of Tribals and Local CBOs

A CBO by producers at the block level comprising of village groups for value addition, marketing, forming linkages with bank, liasoning with Govt. programs like Khadi village industries etc. can be constituted.

5.6. FRA Implementation with Focus on NTFPs

The tribal population filed CFR claims both at individual and community level. As per the Act, forest management committee is to be formed for management, regeneration and conservation of forests for sustainable livelihood and the Gram sabha is to develop the micro-plan for development of NTFPs. These committees should be given training on sustainable harvesting, infrastructural facilities for processing and storage of NTFPs. Civil Society groups working with adivasi communities can play an important role in NTFP conservation, marketing and improving nutritional deficiencies.

5.7. Skill Building

Capacity building on good collection practices, post-harvest mechanism and value addition is recommended. Developing the tribal youth skills is necessary and therefore classes on basic finance and digital literacy along with regular display of training films, posters, brochures, manuals, booklets in 5-8 main tribal languages can be incorporated. Skill development of the tribal youth with basic knowledge, banking, accounting, computer, masonry, plumbing, electrical – engine repairing would prove helpful for the youth of the area.

5.8. Capacity Building at Individual, Gram Sabha and Gram Panchayat Level

The grassroot level NGOs should mobilize tribals to maintain a record of collection of NTFPs and current market information at Gram Sabha level. Linkages of gram sabha/SHGs with the market and companies to procure raw materials, ensuring greater financial return and employment generation for the local people are some areas which need to be worked on. To ensure transparency and their accountability to Gram Sabhas, all procurement agencies should share all information about MSP operation and local accounts with the Gram Sabhas.

5.9. Improving the Well-Being of the Tribal Women

Efforts should be made for greater financial return to women with focus on the needs of the family.

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Annexure I

List of NTFP recorded from the study area

S.N.	Common Name	Botanical Name	Part Used	Own consumption/ Sale	Month in which harvested/ collected	Observation (with respect to climate change
1	Mahuwa, Mehul	Madhucalongifolia	Flower	Both	Mar-April	The flower get destroyed due to untimely rains/hail storms at the time of harvesting
2	Bel	Aeglemarmelos	Fruit	Sale	Feb-March	-
3	Kendwafal		Fruit	Consumption	May	Yield reduced due to fewer trees, past over-lopping
4	Bedipatta	Diospyrosmelanoxylon	Leaf	Sale	May	-
5	Pyarbeej/ chironji	Buchananialanzan	Seed	Sale	April-May	Early harvesting, Lopping
6	Karanj Seed	Pongamiapinnata	Seed	Sale	February	More harvested today due to demand
7	Neem seed	Azadirachtaindica	Seed	Sale	May	-"-
8	Amla	Emblicaofficinalis	Fruit pulp	Sale	Dec-Jan	Yield reduced due to fewer trees, past over-lopping
9	Bahera	TerminaliaBellerica	Fruit rind	Sale	Jan	-
10	Bhelwa	Semecarpusanacardium	Fruit	Sale	Dec.-Feb.	Reduced collection due to less market demand
11	Seetafal	Custrd apple- Annonasquamosa	Fruit	Both	Sept.-Oct.	-
12	Ber	Zizyphusmauritianna	Fruit	Both	May	-
13	Kantesag					
14	Jamun	Guava plum- Syzygiumcumini	Fruit	Both	May-June	-
15	Jalebifal	Sweet Tamarind-	Fruit	Both		-
16	Madhu	Honey	Liquid	Both	April, May October	Reduced now
17	Sal seed	Shorearobusta	Seed	Sale	May	Less collection today due to low market demand
18	Khair	Acacia catechue	Bark	Sale	Dec.-Feb.	-
19	Palash	Buteamonosperma	Flower	Sale	Feb.	-
20	Baans/Bamboo	Dendrocalamusstrictus	Stem	Both	Mar.-June	-
21	Chireta/ Kalmegh	Andrographispaniculata	Stem	Sale	Nov.-Dec.	-
22	Patal plate	Bauhinia vahlii	Leaf	Sale	Oct.-Mar.	Less collection today due to less profit, past over-harvest
23	Mahua seed	Madhucaindica	Seed	Both	June	Less available due to less flowering & less eaten/ sold today due to no market, other oils promoted
24	Harar	Terminaliachebula	Fruit rind	Sale	Dec.-Jan, Feb	-
25	Satavar	Asparagus racemosus	Root	Sale	Dec.-Mar.	-
26	Menda	Litseaglutinosa	Bark	Sale	Dec.-Mar.	Almost extinct due to past harmful harvest
27	Dhawaifool	Woodfordiafruticosa	Flower	Sale	Feb.	More harvested today due to new demand
28	Imli	Tamarindusindica	Fruit	Both	May	-
29	Aam	Mangiferaindica	Fruit	Both	May	-
30	Khajoorpatta	Phoenix sylvestre	Leaf	Both	Nov.-Feb.	-

Annexure 2

Seasonality of NTFP's collection

Name of the item	Months											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Mahuwa flower			■	■								
Bel		■	■									
Kendwa fruit				■	■	■						
BidiPatta					■							
Chironji				■	■							
Karnj Seed		■	■	■	■	■						
Neem Seed					■							
Amla					■				■	■	■	
Bahera		■	■									
Bhelwa	■	■			■	■	■					■
Sitafal									■	■		
Ber	■	■			■						■	■
Jamun					■	■	■					
Jalebi fruit												
Honey				■	■					■		
Fuel wood/fodder	■	■	■	■	■	■	■	■	■	■	■	■
Saal Seed				■	■	■						
Khair	■	■										■
Palash Fruit		■										
Bamboo			■	■	■	■						
Chirainta								■	■	■		
Patal plate			■	■								
Harar	■	■	■									■
Satavar	■	■	■									■
Menda	■	■	■									■
Dhawi flower		■										
Imli					■							
Mango					■	■	■					
Khajor leave	■	■									■	■

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