

# Survey Report

On

## Assessment of NTFP production with reference to Climate Change in three Forest Divisions of Chhattisgarh

Under

*NAFCC Project "Climate Adaptation in Wetlands along the Mahanadi River Catchment Area in Chhattisgarh"*



**Chhattisgarh State Centre for Climate Change**  
**Office of Principal Chief Conservator of Forest, Chhattisgarh**  
**Aranya Bhawan, North Block, Sector-19, Nava Raipur (C.G.)**

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## **Assessment of NTFP production with reference to Climate Change in three Forest Divisions of Chhattisgarh**

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*It is our pleasure to bring out the NTFP production Assessment Baseline survey report of the 19 project villages of all three projects Forest Division under the project “**Climate Adaptation in Wetlands along the Mahanadi River Catchment Area in Chhattisgarh**”, funded under National Adaptation Fund for Climate Change (NAFCC) from Ministry of Environment, Forest and Climate Change, Government of India. Implementation of this project demands certain starting point and accordingly we are trying our best to establish a better understanding and benchmark in proper & sustainable manner of collection of NTFPs to sustain the rural livelihoods.*

*The present study was assessment of status and potential of non-timber forest products (NTFPs) in community forests and the forest area of Dhमतारी, Mahasamund and Balodabazar Districts in Central part of Chhattisgarh. The human ecological approach, participatory rural appraisal, focus group discussions and interviews were used to gather data and information for analysis. The results of the data analysis indicate that the area harbors a high diversity and potential of NTFPs. The NTFP species are clustered into various categories on the basis of their market value and resource availability; they still possess ample knowledge of plants and their uses. It is observed that the proper management of the NTFPs could play a vital role in the improvement of people’s livelihood on a sustainable basis.*

*We would also like to show our gratitude to **Shri Alok Kumar Tiwari**, <sup>IFS</sup> Divisional Forest Officer (DFO), Mahasamund Forest Division, **Shri Amitabh Vajpayee**, <sup>IFS</sup> Divisional Forest Officer (DFO) Dhमतारी Forest Division, and **Shri Vishvesh Kumar**, <sup>IFS</sup> Divisional Forest Officer (DFO) Baloda Bazar Division. At last but not the least, we would like to thank whole Field staff of the department and Community of the area for their great support on the field. We would like to thank our survey team who took this survey very seriously and participated actively. We are sure that this report will serve as a baseline to Assessment of NTFP production with reference to Climate Change in three Forest Divisions of Chhattisgarh. The report is helpful to assess the role and impact at the end of the project.*

**(Authors)**

<b>List of Abbreviations</b>	
<b>Abbreviations</b>	<b>Expanded</b>
BLS	Baseline Survey
CGMFPF	Chhattisgarh Minor Forest Produce Federation
CSAPCC	Chhattisgarh State Action Plan for Climate Change
CSCCC	Chhattisgarh State Centre for Climate Change
DFO	Divisional Forest Officer
DPR	Detailed Project Report
FSI	Forest Survey of India
FGDs	Focus Group Discussions
GHG	Greenhouse Gas
GoCG	Government of Chhattisgarh
HHs	House Holds
JFMC	Joint Forest Management Committee
NAPCC	National Action Plan on Climate Change
NAFCC	National Adaptation Fund for Climate Change
NTFP	Non-Timber Forest Produce
SFRTI	State Forest Research and Training Institute
UNFF	United Nation Forum on Forest

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## Introduction:

Non-timber Forest Products (NTFPs) are important tools for addressing poverty issues for the marginalized, forest dependent communities, by contributing to livelihoods, including food security, income, health and sustainable human development. Globally, an estimated 350 million people, mostly in developing countries depend on NTFPs as their primary source of income, food, nutrition, and medicine (FAO, 2005)<sup>[1]</sup>.

In India, more than 41 million tribals and forest dwellers derive their earnings from these products after consuming about 60% of collected NTFPs for personal use. Contemporary multidimensional forest management has led to a much broader concept of non-wood products and services include landscape amenity, clean air, water storage, biodiversity, providing a space for recreation and tranquility. NTFP collection, an important source of income for forest dwellers and rural poor, varies from state to state ranging from 5.4 to 55 percent. Moreover, 60% of NTFP is consumed as food or as a dietary supplement especially during lean season by forest dwellers. In Manipur, India alone, nearly 90% of the population depends on forest products as a major source and some 250000 women are employed in collecting forest products (FAO, 1992)<sup>[2]</sup>.

According to the Report of the Sub-Group- II on NTFP in India, there are about 15,000 plant species out of which nearly 3000 species (20%) yield NTFPs. However, only about 126 species (0.8%) have been commercially developed. NTFP activities hold prospects for integrated forms of development that yield higher rural incomes and conserve biodiversity while not competing with agriculture. Rural population especially forest dwellers in India depend on the forests not only to supplement their domestic requirements for fuel, foods, fruit, fodder, fiber and medicines but also to supplement their income by selling part or all of their collection in local markets<sup>[3]</sup>.

Sustainable Management in the 12th 5-Year Plan 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”. It is estimated that 275 million poor rural people in India—27 percent of the total population—depend on NTFPs for at least part of their subsistence and cash livelihoods (Malhotra & Bhattacharya, 2010; Bhattacharya & Hayat, 2009). NTFP contributes to about 20% to 40% of the annual income of forest dwellers who are mostly disadvantaged and landless communities with a dominant population of tribal's. It provides critical subsistence during the lean seasons, particularly for primitive tribal groups such as hunter gatherers, and the landless. 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<sup>[3]</sup>.

According to UNFF (United Nations Forum on Forests) over 1.6 billion people depend on forests for subsistence, livelihoods, employment and income generation, but at the end all of humanity depends on forests. Forests provide a wide range of goods and services, that create opportunities to address many of the SDGs and play an important role in the economy of many countries and rural communities, especially the poorer ones (GFG 2.1, SDG 8). Its contribution to the global GDP in 2011 was USD600 billion (0.9 percent), but it is significantly higher in low-income countries, where it reaches 1.4 percent, compared with only 0.1 percent in high-income

countries. Additionally, Non-wood forest products (NWFPs) are important sources of livelihood for many rural dwellers and for industries that process or use these products. The annual value of forest contributions exchanged for cash in the developing world is in the neighborhood of US\$ 250 billion, but it is likely to be two to three times greater for benefits that are not exchanged for cash. The total number of people employed in the formal forestry sector is around 13 million, but those employed in the informal sector are near 45 to 50 million (Forests and SDG8, UNFF 2019)<sup>[4]</sup>.

Climate Change described by a few outcomes that influence livelihood in numerous parts of the world will keep on unfavourably influence socio economy including forest resources. This has been conducted to evaluate the effect of Climate Change on forest as well as its dependent communities. Information were gathered through family interview, transect walk and direct field observations. Most of the respondents saw that there has been an adjustment in the atmosphere design because of expanded temperatures and uneven rainfalls.

### **About the Project:**

Present study has been done under the project namely "Climate Adaptation in Wetlands along the Mahanadi River Catchment Area in Chhattisgarh; the Project is mainly focused on Wetland Ecosystem conservation and improvement and Food & water Security. The area of the Project is 20,000 ha. in 3 Districts of Chhattisgarh namely Mahasamund, Raipur (Baloda Bazar) and Dhamtari.

**Name of Executing Entity:** Chhattisgarh State Centre for Climate Change, Monitoring & Evaluation- Branch, Office of Principal Chief Conservator of Forest, Aranya Bhawan, North Block, Sector-19, Nava Raipur (C.G.)

### **Project Objectives:**

- Develop baseline on Climate Change vulnerability to ecosystems and local livelihood in the Project areas.
- Promote an integrated climate adaptation strategy for wetlands and its dependent communities and demand side management.
- Improving adaptive capacity of farmers and other wetland dependent local communities, and
- Identify best practices and successes from this pilot Project and develop knowledge products for wide Dissemination for replications in wetland management across the State of Chhattisgarh.

## **National Adaptation Fund for Climate Change (NAFCC):**

The National Adaptation Fund for Climate Change (NAFCC) was established in August, 2015 to meet the cost of adaptation to Climate Change for the State and Union Territories of India that are particularly vulnerable to the adverse effects of Climate Change. The Projects under NAFCC prioritize the needs that build climate resilience in the areas identified under the State Action Plan on Climate Change (SAPCC) and the relevant Missions under National Action Plan on Climate Change (NAPCC). Total 21 Adaptation Projects were approved in India. Chhattisgarh is one of them; the Project entitled “Climate Adaptation in Wetlands along the Mahanadi River Catchment Area in Chhattisgarh” in India.

## **Major Forest Type in Chhattisgarh and Biodiversity**

The recorded forest area in the state is 59,772 sq. kms, which is 44.21 percent of its geographical area. Reserved, Protected and Un-classed Forests constitute 43.13 percent, 40.21 percent, and 16.65 percent of the total forest area respectively. The state has three National Parks and eleven Wildlife Sanctuaries covering an area of 4361.4 sq. kms and 3577.8 sq. kms respectively. The forest ecosystems can be broadly classified into following three types depending upon species composition<sup>[5]</sup>.

S.No.	Forest Type	Area (Sq. kms.)	% of G.Area	Biodiversity status
1	Mixed Forests	34230	25.32	Very Rich
2	Sal Forests	19682	14.56	Rich
3	Teak Forests	5858	4.33	Fairly Rich
Total		59,772	44.21	

## **Environmental importance of NTFPs**

NTFPs speak to an approach to meet ecological goals, for example, protection of forests, watersheds, and organic assorted variety. Numerous scientific studies recommend that NTFPs can help locals to address their issues without risking forest ecosystems Conservation endeavors try to empower low-force, the broad frameworks and work improvement as a significant instrument to accomplish nature preservation without a sound information of the resource and ordinary checking, harvests of certain NTFP assets can have an enormous effect<sup>[6]</sup>.

## **NTFPs and communities**

NTFPs are utilized and managed in complex financial and biological situations. In customary woodland networks, numerous NTFPs might be utilized for subsistence while others are the primary source of pay. Some NTFPs have critical social worth, as totems, incense, and other ceremonial things. Others have significant therapeutic worth and add to the network's wellbeing and prosperity. However, as forest areas shrink, human populations grow, markets change, and traditional management institutions lose their authority, the sustainable production of many NTFPs is no longer assured. While business NTFPs can be of impressive incentive to needy individuals, it is critical to perceive the imperatives that exist outside the insignificant gathering and reaping of NTFPs. Needy individuals are poor since they have restricted access to business sectors,



inadequate capital and for the most part frail dealing power. Some NTFPs may offer work and pay producing openings. Nevertheless, understanding this potential will require putting resources into different regions too, for example, smaller scale fund plans, transport and preparing. It is likewise critical to see how the entire NTFP chain works, from crude material generation to the last market, to recognize bottlenecks and comprehend their potential (Archana Mhaskey, 2019 Interim Report) [8].

### **NTFPs and Climate Change impacts**

The effect of Climate Change on NTFPs is a territory that requires more noteworthy consideration from the study for both Climate Change and the arrangement of NTFPs administrations convolute the comprehension of Climate Change impacts on these assets. When all is said is done, the impacts of Climate Change on NTFPs are progressively hard to survey as a result of high vulnerability with respect to biological impacts of Climate Change, and furthermore in light of the fact that information on the present and anticipated future interest for these items is fragmented at the worldwide just as territorial and national levels. Climate Change has expanded recurrence and seriousness of outrageous atmosphere occasions, for example, heat pressure, dry spells and flooding in the coming. Specifically, it will adjust the dangers of flames and irritation and pathogen flare-ups, with negative ramifications for nourishment, fiber and backwoods generation including NTFPs [8].

In Districts with huge forest subordinate populaces, anticipated abatements in precipitation, and expanded seriousness and recurrence of dry season, can be relied upon to worsen momentum misuse weights on forest products and extension of farming into backwoods lands in these locales, this can be required to force extra weights on individuals who rely upon these NTFPs for their household vitality needs and different NTFPs for their employments.

### **NTFP's contribution to multiple income sources**

As a cardinal component of multi-utilitarian forest system, NTFPs add to differentiated pay sources to country networks. This assorted variety constantly builds the versatile limit and reaction choices of the individuals to environmental change stuns, since they are not subject to a solitary animal varieties or yield. The suggestion is that since the provincial networks have a variety of substitute salary sources from NTFPs like therapeutic herbs, nectar, mushrooms, colors, hedge meat, snail cultivating and organic products, they are less disposed particularly with appropriate edification, to take part in aimless felling of trees as a methods for getting pay [8].

### **NTFPs Contribution to Carbon Sequestration**

Forest stores a lot of carbon in trees, under-story vegetation, and soils. They have been evaluated to internationally contain 1.2 trillion huge amounts of carbon, which is simply over a large portion of the aggregate in earthly vegetation and soils. Non timber items can contribute straight forwardly or in a roundabout way to carbon stockpiling or sequestration. The developing of quickly developing woody NTFPs like bamboo can be utilized to decrease discharges. On account of circuitous effect, and other natural product harvests involves a useful timberland and a motivator to ensure backwoods frameworks. Along these lines the support of such a forest spread can in a roundabout way help to store and sequester carbon [8].

## Climate Change, Vulnerability and Adaptations

Vulnerability means that individuals introduction to outer dangers, stuns and shocks and their capacity to adapt to, and recuperate from, the subsequent effects. Powerlessness may contrast occasionally or at various occasions inside individual's lives. It additionally varies crosswise over gatherings inside communities or people inside a family, inferable from their business exercises or social standing. The feasible administration of forest and trees outside woodlands for NTFPs and advantages exhibits a scope of potential adjustment choices, especially for provincial individuals in creating nations and it shows how as of now devastatingly affect the helplessness of the poor. Expanding recurrence and power of climate related boundaries, and steady changes in the normal temperature will compound these effects. This has suggestions for the weakness of the poor to stuns of different types. The poor are frequently the most presented to climatic fluctuation as a result of where they live or their job exercises. As indicated by some studies that farmers will be unable to adapt to environmental change successfully because of their decreased versatile limit and higher climate vulnerability and that environmental change is relied upon to affect vigorously on forest abiding communities with no other source of livelihood<sup>[8]</sup>.

NTFPs are progressively getting to be significant as far as country and urban jobs, as there is a built up circumstances and job of forest products is in nourishment security, commitment to water supply, arrangement of monetary options and backing to different divisions has been perceived There has been expanded acknowledgment of the estimation of non-timber forest products to individuals' vocations. For instance, wild nourishments enormously improve sustenance and increment nourishment security especially for provincial and it is discovered that 80% of community living nearby Forest or forest Reserve got wild organic products, vegetables and fruits from the forest that help in improving their health and nutrition needs<sup>[8]</sup>.

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**About the Study:**

A preliminary survey was conducted to gather information on the geographic area of villages, occupation pattern, NTFP collection practices, storage, selling process and market status aspects of the households. The interaction was held with officials and local people to explore issues, challenges and opportunities of NTFP in all three districts.

The study covers the Project component 2.2.1- Assessing baseline forest cover, forest biomass, NTFP production etc. This study was focused on NTFPs baseline Survey conducted in three Districts of the Chhattisgarh i.e. Mahasamund, Dhamtari & Baloda Bazar to identify which type of challenges being faced by rural community during collection of NTFPs and what are the major cause of redesigning production of forest produced due to adverse effects of environmental change. The people recognitions on temperature and precipitation examples were in accordance with the accessible climatic information records. People living around forest sites were found to utilize more than one system adapt to the adverse impacts of Climate Change.

The study presumed that NTFPs still assume as security job to help communities in unfavorable circumstance, for example, crop failure under the present climatic conditions. The need for sustainable harvesting and access to NTFPs markets is urgent. Market survey was additionally led in chosen markets to get data identified with the advertising of NTFPs. The findings revealed that NTFPs contribute significantly to rural livelihoods by way of food, employment, and income, particularly for the poor and vulnerable. However, recent trends indicate that the resource base of NTFPs is dwindling, particularly because of overexploitation and expansion of agricultural lands in forest area.

**Objectives of the Study:**

- The primary objective of this study is to assess the present status of NTFPs in NAFCC Project area.
- Identify various types of NTFPs accessible in the study area.
- To research the local perceptions on Climate Change effects on NTFPs accessibility and community.
- To examine the vulnerability of NTFPs and communities dependent on forest.
- Examine supply, access and utilization of NTFPs by family as a procedure to adapt and adjust with the impact of Climate Change.

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## Project area:

### a. Mahasamund:-

Mahasamund District average rainfall is 1373 mm, the temperature varies between 30 and 48°C (86 and 117°F) in summer and between 10 and 25°C (41 and 77°F) during winter. However, extremes in temperature can be observed reaching a maximum temperature to 49°C. It is located in the Central part of Chhattisgarh Plain Zone. The District is situated in the lower Central part of the State. Mahasamund Block comes under this Project with total area of 6000 Ha, it includes 7 Village respectively Amlor, Marud, Karradih, Kediya di h, Pasid, Chuhari and Borid in Mahasamund, Shirpur Forest Range.

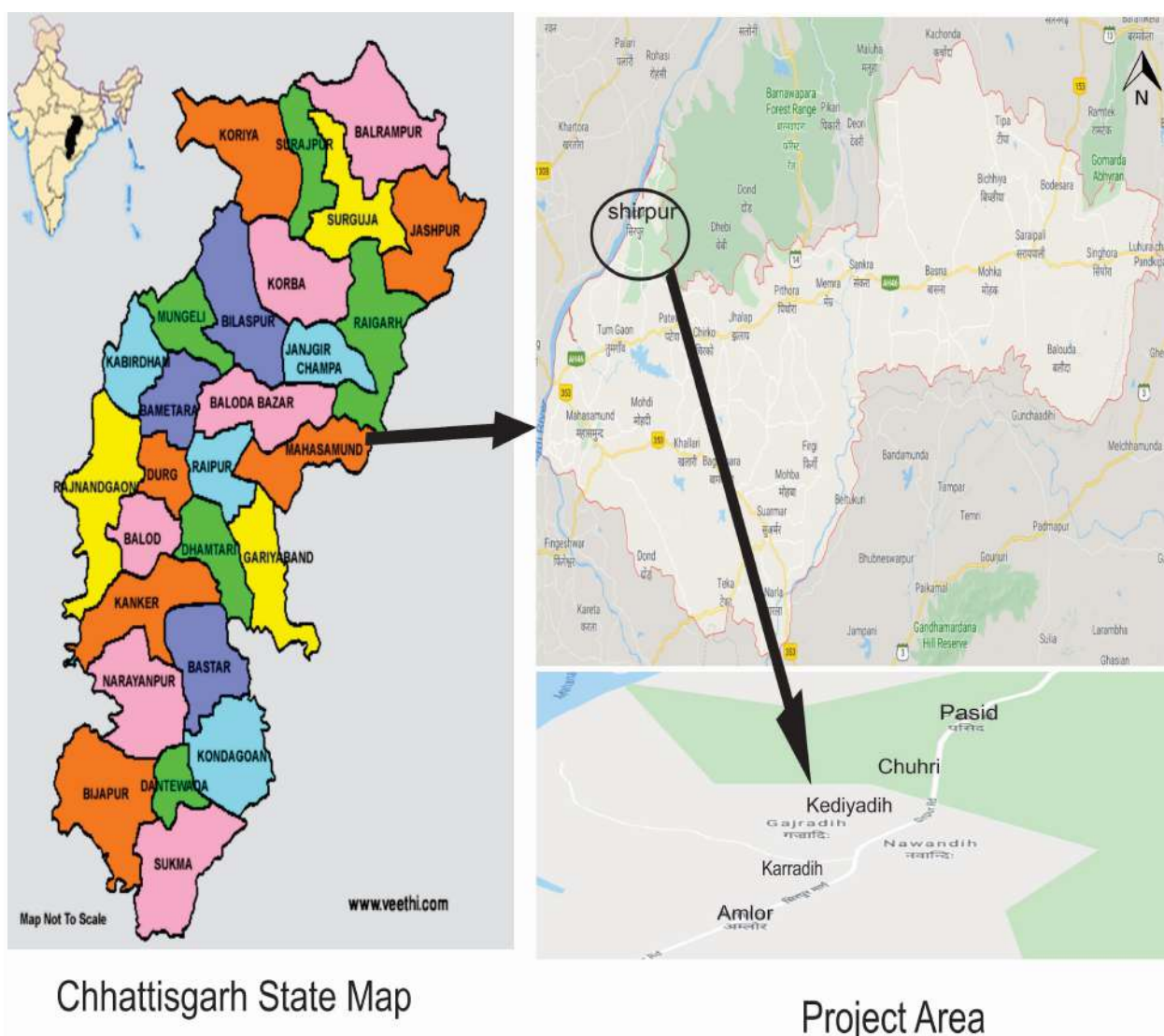


Fig. 1. Location map of Project Villages (Amlor, Marud, Karradih, Kediya di h, Pasid, Chuhari and Borid) in the Shirpur forest range, Mahasamund, Chhattisgarh

## b. Dhmatrai:-

Dhamtari District average rainfall is 1256 mm, the temperature varies between 30 and 47°C (86 and 117°F) in summer and between 10 and 25°C (41 and 77°F) during in winter. It is located in the Central part of Chhattisgarh Plain Zone, rich from very good forest diversity and various type of Medicinal plants or NTFP available in this Forest Division. The District is situated in the lower Central part of the State. Dhamtari Block comes under this Project with total area of 8000 Ha; it includes 5 Village namely Chargaon, Jabarra, Munaikera, Bhobhalabakra, and Dinkarpur in Dugali Forest Range.

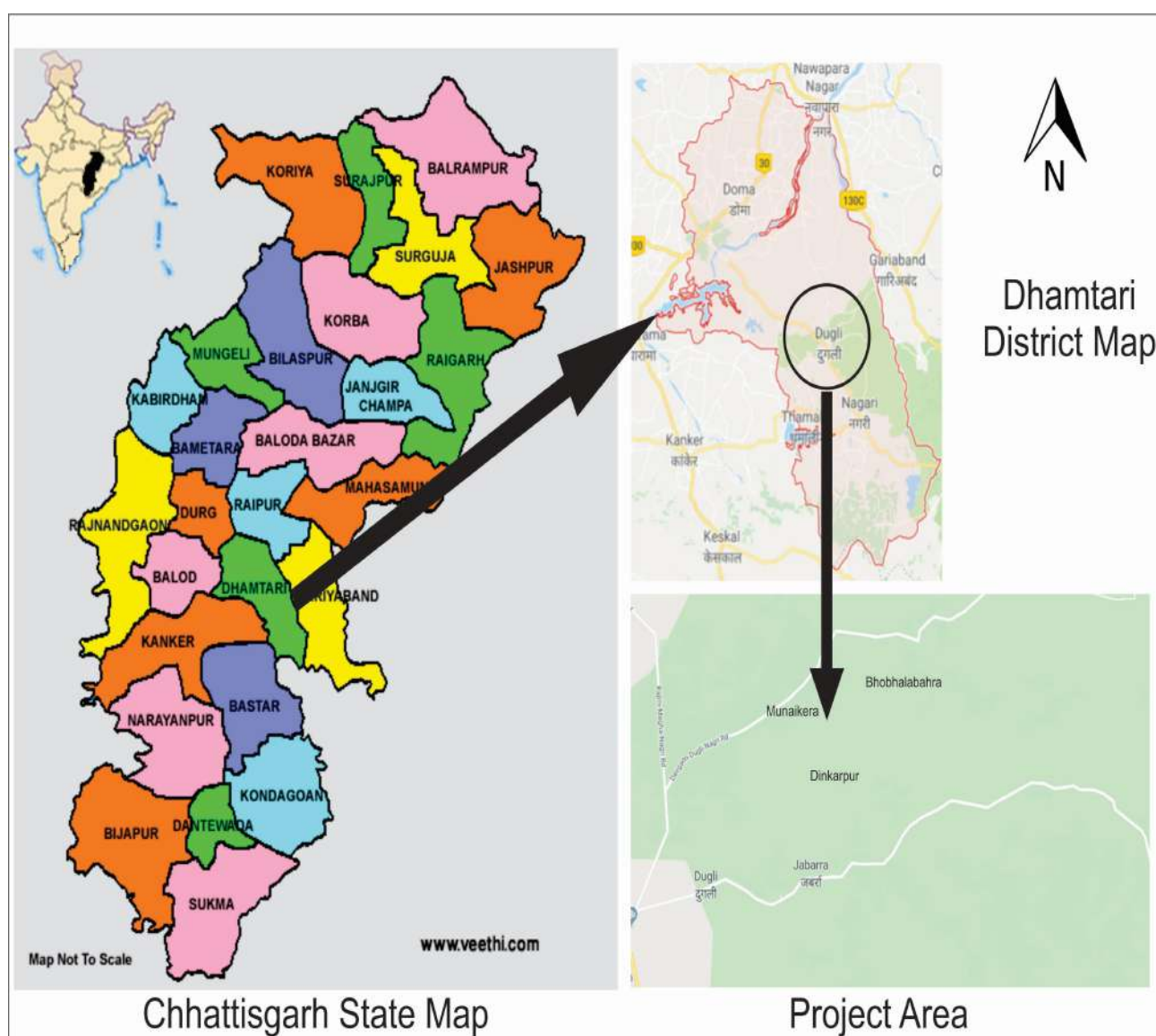


Fig. 2. Location map of Project Villages (Dinkarpur, Munaikera, Bhobhalabakra (Near Devgaon), Chargaon and Jabarra) in the Dugali forest range, Dhamtari, Chhattisgarh



### c. Balodabazar:-

Balodabazar District average rainfall is 1225 mm, temperature in winter is 10 to 27.1°C and in summer temperatures can reach up to 35 to 48°C (100°F). It is situated in the Plains of Chhasstigarh region. Two-Forest Range is selected in Balodabazar Forest Division, the location map given below shows, Project Village (Khosada, Daldali, Mahuadih, Mahkoni, Limtari, Shinghtar, and Kariyatar), Balodabazar.

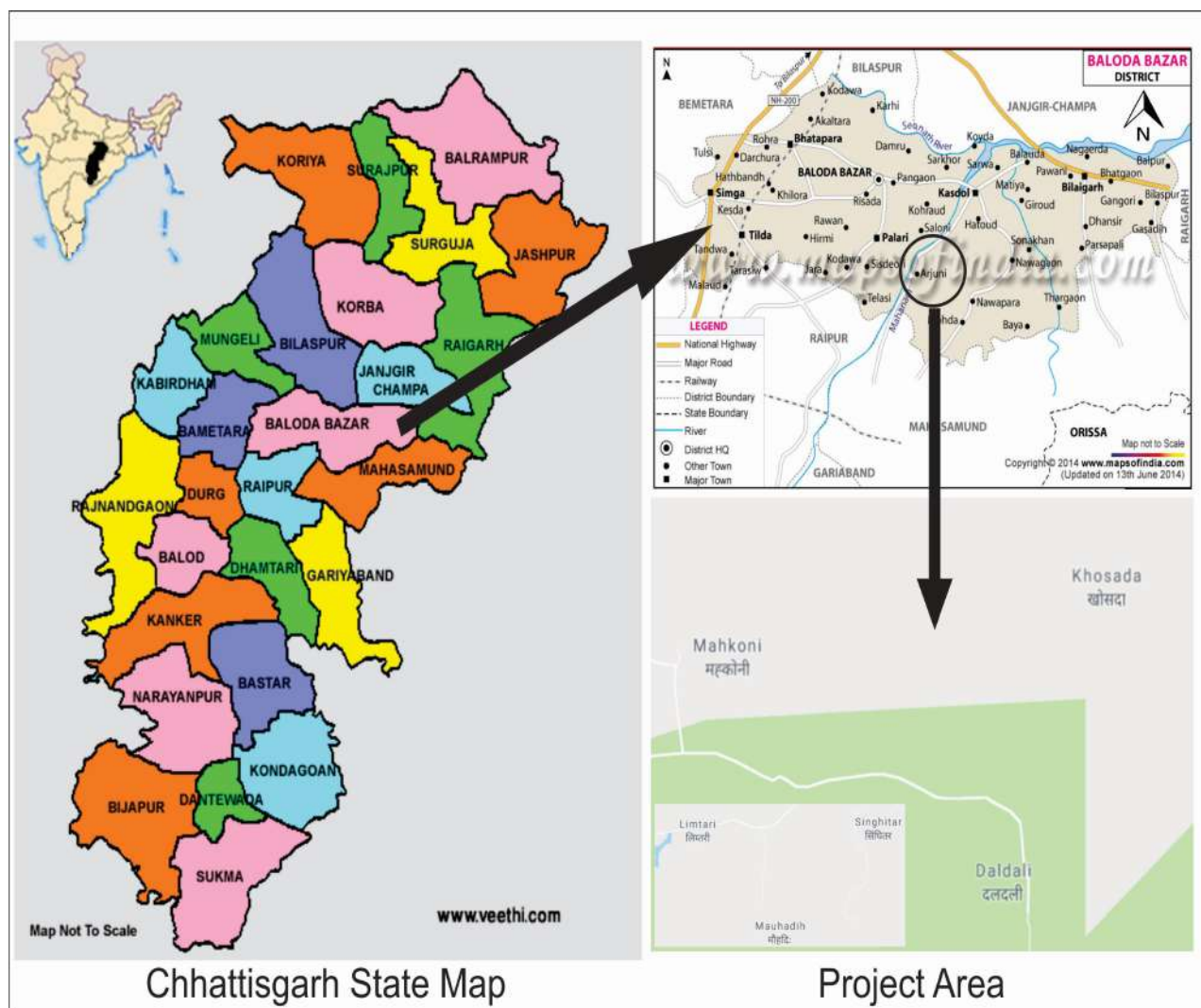


Fig. 3 Location map of Project Village (Khosada, Daldali, Mahuadih, Mahkoni, Limtari, Shinghtar, and Kariyatar), Balodabazar, Chhattisgarh

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## **Methodology**

A multidisciplinary team of experts from Chhattisgarh State Centre for Climate Change (CSCCC) has visited the Project Villages of Mahasamund, Dhamtari and Balodabazar forest division From 21 May to 24 May 2019 to collect the data, conduct case study and group discussion, for baseline study of NTFP dwellers in the Project area among local Village communities and individuals.

- Secondary data related to the survey were assessed from available literature, government reports and different state and District's official websites.
- Whereas primary data related to survey has been collected through group discussion and in-depth family level interviews and case studies with the help of a well-structured interview schedule.

### **1) Study Area**

The present Study has been conducted in NAFCC Project area; study was carried out in three Forest Divisions of the State i.e. Mahasamund, Dhamtari & Baloda Bazar. Under the Project area we selected a total of 19 Villages, finally 5 to 6 respondents (NTFPs collectors) were selected randomly from each of the selected Villages. Thus 91 respondents were selected from the selected Project area.

### **2) Data Collection**

Data were collected using Focus Group Discussions (FGDs), key informant interviews, household questionnaires survey, and spot market analysis. FGDs are aimed at capturing information on available NTFPs in the area, places where they are collected, unit value of each NTFP, main sources of household income. Key informant interviews were conducted to Village leaders, Village elders, NTFPs vendors. Interview Schedule and group discussion formats are enclosed in Annexe 1.1 & 1.2. Following area covered during collection of primary data-

- Socio-Economic data
- Flora of the area
- Main NTFP of the area
- Market status (Saptahik Bazar / Vanopaj mandis / local markets)
- Climate Change awareness and perception

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## Results and Discussion:

### Years wise NTFPs Production of Division level:-

During the survey year wise NTFPs production secondary data were collated from Dhamtari, Mahasamund and Baloda Bazar forest division are as follow.

**Table No. 2 : Year wise Productivity of NTFPs in Dhamtari Forest Division**

S.No.	Name of NTFP	Years (In Standard Bag)			
		2015	2016	2017	2018
1	Tendu Leaves	24228.285	21150.65	26273.38	28394.80
S.No.	Name of NTFP	Years (Quantity in Quintal)			
		2015	2016	2017	2018
1	Amla	288.42	262.20	1032.29	591.00
2	Bhuineem (Kalmegh)	105.76	96.15	852.00	479.40
3	Chirota Seed	235.01	213.65	548.00	466.95
4	Chirayta	237.82	216.20	274.44	481.22
5	Arjun Chal	403.15	366.50	1828.26	3270.69
6	Imli	739.79	672.50	548.00	4129.12
7	Chironji Seed	521.25	473.87	60.00	1233.02
8	Dhawaiphool	887.67	806.98	864.00	389.21
9	Harra Seed	6568.42	5971.29	12133.85	13463.36
10	Baheda	674.85	613.50	383.83	2217.00
11	Bhelwa	1064.08	967.35	1121.30	252.00
12	Mahua	18.76	17.06	655.00	956.63
13	Malkangni	123.87	112.61	59.23	125.00
14	Nagarmotha	297.07	270.07	40.00	439.52
15	Khumbhiphool	336.40	305.82	443.32	221.95
16	Kalounji	617.02	560.93	60.10	21.31
17	Ber	18.75	17.05	10.50	32.40
18	Belgiri	491.93	447.21	386.00	855.95

Source: NTFP Section, DFO office Dhamtari & District Union CGMFP Fed. Ltd. 2019

**Table No. 2: Year wise Productivity of NTFPs in Mahasamund Forest Division**

S.No.	Name of NTFP	Years (In Standard Bag)			
		2015	2016	2017	2018
1	Tendu Leaves	79096.00	70464.00	94896.00	82002.00
S.No.	Name of NTFP	Years (Quantity in Quintal)			
		2015	2016	2017	2018
2	Kusmi Lakh	203.57	116.48	1.59	0.76
3	Rangini Lack	309.42	148.21	15.31	46.72
4	Harra Seed	17.50	69.24	10.75	0.00
5	Chironji Seed	2.75	29.49	0.00	49.65
6	Mahua Flower	20.75	0.00	0.00	0.00

Source: NTFP Section, DFO office Mahasamund



**Table No. 3: Year wise Productivity of NTFPs in Balodabazar Forest Division**

S.No.	Name of NTFP	Years (In Standard Bag)			
		2015	2016	2017	2018
1	Tendu Leaves	22273.87	21229.19	24961.33	21289.99
S.No.	Name of NTFP	Years (Quantity in Quintal)			
		2014	2015	2016	2017
2	Sal Seed	237.84	0.00	0.00	0.00
3	Kusmi Lakh	0.00	9.52	11.85	0.00
4	Rangini Lack	0.00	3.52	2.20	0.00
5	Harra	0.00	0.00	0.00	0.00
6	Chironji Seed	0.00	0.00	23.24	0.00
7	Mahua	0.00	287.33	0.00	121.90

Source: District Union CGMFP Fed. Ltd. 2019

### Community perception of NTFPs availability and Livelihood:

The majority of landless labour has found marginal farmer and small farmer. The marginal farmer had 3.32 acre in the study area. During study respondent collected 13 types of NTFPs. The contribution of NTFPs in household economy varied from average income Rs. 12000 to 25000. Annual income of majority of respondents in the study area ranges between Rs. 35,000 to Rs 70,000, while their average net annual income was Rs. 60069.57. NTFPs collection is back bone for creation of their socioeconomic structure of rural community as well as tribals, derives major contribution of annual income for their livelihood from the wage earning (agricultural labour, MGNREGA etc), women play major role in the NTFPs collection from the forest.

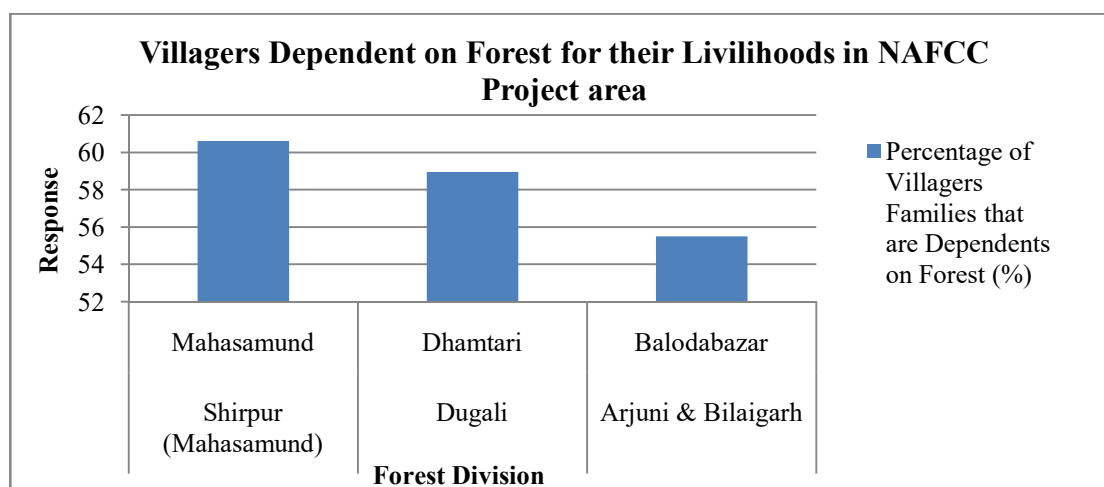
The percentage of women in NTFPs collection was recorded 60 % including child in all three study sites, mostly women involve in Mahua, Tendu leaves and Mahul patta collection. During household survey according to respondent 13 NTFPs species were informed and they belong to 08 trees, 3 herbs, 1 climber species and 1 fungicidal (Mushroom) at the time of study. A variety of NTFPs viz, seeds, leaves used for plate making, edible products, Oil yielding, Fiber, and Broom making, Medicinal plants and fungicidal (wild edible Mushroom) were identified. The collection, processing and value addition of NTFPs were carried out by traditional crude method. With regard to the place of marketing of NTFPs, the majority of the respondents were selling of their NTFPs in weekly markets.

The forest area under the Project is Moderately Dense and mixed forest. The Villagers collected NTFPs like leaves, flowers, seeds, fruits, bark, stem, and rhizomes for their livelihood in unsustainable methods because of this the regeneration of species badly affected. While business NTFPs can be of impressive incentive to needy individuals, it is critical to perceive the imperatives that exist outside the insignificant gathering and reaping of NTFPs. In study area, maximum peoples are dependent in forest for livelihoods or income. In comparison to Dhamtari and Mahasamund Project area Balodabazar Project area were very less forest cover and very less respondent to collect NTFPs, in that area 55.50% respondent are belong to collect NTFPs in Mahkoni, Daldali, Khosda and some part of Mahuadih Project Village involve in NTFPs Collection. Migration was very high in Shighitar,

Kariyatar, Limtari and Mahuadih because of mostly area of this Village is rocky hard and very less top soil. Details are given in table No. 4.

<b>S. No.</b>	<b>Forest Range</b>	<b>Forest Division</b>	<b>Percentage of Villagers Families that are Dependents on Forest (%)</b>
1	Shirpur (Mahasamund)	Mahasamund	60.61
2	Dugali	Dhamtari	58.94
3	Arjuni & Bilaigarh	Balodabazar	55.50

\*Data are based on multiple responses



### Traditional collection methods of NTFPs

The collected record during the survey of 13 plants as NTFPs in which species were informed and they belong to 08 trees, 3 herbs and 1 climber species at the time of study. At Villagers NTFPs mostly fruits were collected using crude method like cutting of branches or shaking of tree. The fruit collection was carried out of *Buchanania lanzan*, *Diospyros melanoxylon*, *Terminalia bellerica*, *Syzygium cumuni*, *Aegle marmelos*, *Tamarindus indica*, *Semecarpus anacardium*, *Schleichera oleosa*, *Emblica officinalis*, *Terminalia chebula* and *Azadirachta indica* etc. The medicinal plant Kalmegh was uprooted before maturity of seed thus next year production declines. Most of the trees, shrubs, herbs and grasses were used for medicinal purposes. Tribal people use the roots of many trees, shrubs, herbs and grasses as medicine. The fresh leaves of plants were also used as vegetable and climber medicine such as *Cassia tora* (Charota) leaves. The people used to cut the branches of *Buchanania lanzan*, *Terminalia chebula* and *Emblica officinalis* for collecting its fruits and pods. The leaves of *Cassia tora* was also collected maximum before maturity of plants for the use of vegetable purpose thus seed production affected.

The collection has been done by only traditional crude method, which we may call as destructive harvesting of NTFPs. The collected material like leaves, flowers, seeds, fruits, and rhizomes of different NTFPs for their livelihood in unscientific manner because of this the regeneration of species badly affected. The quality of produce would not be good as demanded in the market therefore, the

produce does not fetch good price in the market. The collection of produce and its post harvest technique is playing a positive role to preserve quality material for longer duration and fetching good price in market.

### **Community perception Climate Change effects on NTFPs:-**

The different communities stated how Climate Change is affecting the growth of NTFPs and the production is decreasing slowly. Some of the major NTFPs are declining which is affecting not only their consumption or nutrition required but affecting them economically as these communities are only dependent upon the sale of forest products.

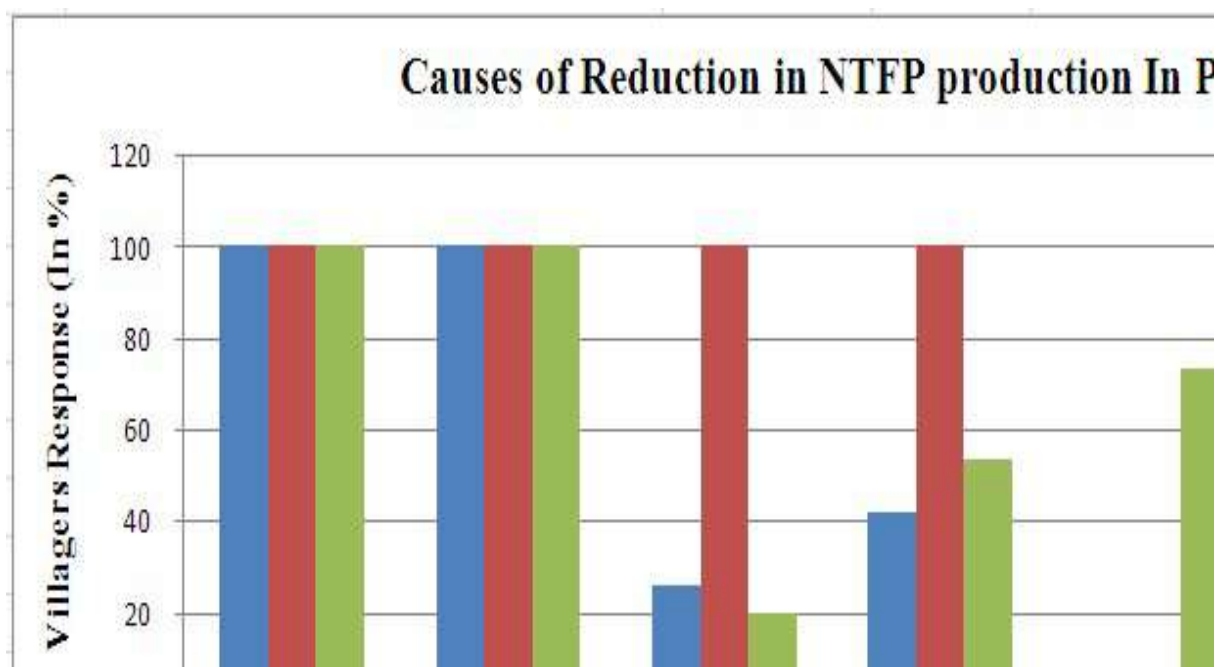
The respondents were enquired regarding their perception about factors affecting the poor availability of various NTFPs. The data reveals that the majority of respondents (100%) were found bad weather (Heavy and continuous rainfall and blockage of road by the over flow of the rainwater etc. as a main factor affecting their availability. While the other factors identified by over collection by outsiders, damage of plant or destructive harvesting of during collection (100%), climate change such as unseasonal rainfall, raise in temperature (65.09%) and natural calamities Drought, forest fire, storm etc. (48.60%) details are given in table no. 5.

- The problem of deforestation is seen in Balodabazar and other two regions are not facing this problem.
- Dhamatari is facing forest fire issue more than other regions.
- Destructive harvesting is being done in all three regions.
- Balodabazar has pollution related problems as it is close to industrial areas.
- All three regions are affected through weather change.

**Table No. 5: Causes of Reduction in NTFP production in Project Area**

S. No.	Reason or Causes	No of respondent	Mahasamund (In %)	No of respondent	Dhamtari (In %)	No of respondents	Balodabazar (In %)	Average
1	Destructive Harvesting of NTFP	31	100	25	100	30	100	100%
2	Bad Weather/ Cloud/ Heavy Rain	31	100	25	100	30	100	100%
3	Forest Fire	8	25.81	25	100	6	20	48.60%
4	Unseasonal rainfall, Raise in temperature (Heat waves)	13	41.94	25	100	16	53.33	65.09%

\*Data are based on multiple responses



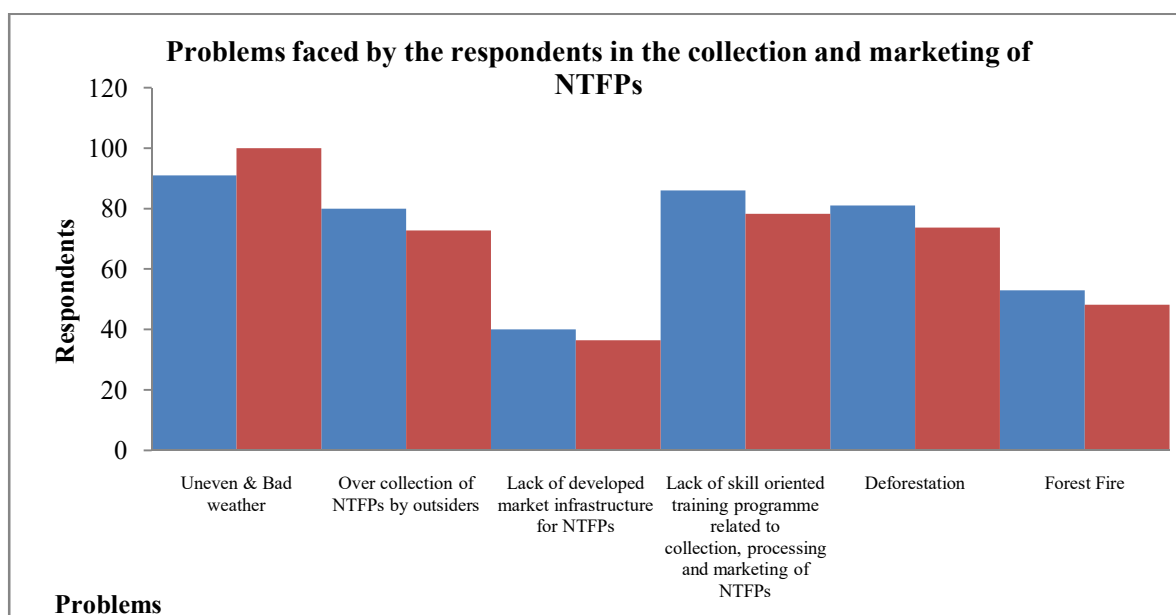
### NTFPs and Climate Change impacts

During survey, mostly respondents are of the view that the challenges of climate uncertainty are a major cause of reducing NTFPs production. Climate Change has expanded recurrence and seriousness of extraordinary climate occasions, for example, heat pressure, dry spells and flooding in the coming. Specifically, it will change the risks of disasters and pathogen problem arising. In Districts with forest dependent community, anticipated reductions in water availability is leading to lack of products and services from the forest. During the survey, highest problems of farmers to Climate Change on different form like drought, flood, insect and new pest in agriculture crops, these problem are due to Climate Change in Project area mostly affected from drought and uncertainty of weather.

### Problems faced by the respondents in the collection and marketing of NTFPs

The majority of the respondents pointed out that they were facing the problem of low and fluctuated market. Price of NTFPs primarily followed by existence of bad weather 100%, lack of transport facilities and developed market for marketing of NTFPs (36.40%), lack of skill oriented training programme related to collection, processing and marketing of NTFPs (44.44%), deforestation (73.71%), over collection of NTFPs by outsiders (72.80%). lack of skill oriented training programme related to collection, processing and marketing of NTFPs (78.26%), and forest fire (48.23%), lack of low cost storage facilities were also reported as other problems faced by the respondents details are given in table No. 6.

Table No. 6: Problems faced by the respondents in the collection and marketing of NTFPs		
Problems	Respondents	Percentage
Uneven & Bad weather	91	100
Over collection of NTFPs by outsiders	80	72.80
Lack of transport and developed market infrastructure for NTFPs	40	36.40
Lack of skill orientation training programme related to collection,	86	78.26
Deforestation	81	73.71
Forest Fire	53	48.23



### Local market rates of various NTFPs in study area

During the market information, study season wise NTFPs rates are enlisted. Total 13 NTFPs market rate from three different Dugli markets is nearest in Project area. In Dugli weekly market held on Friday where people came for selling their products. Tendu leaf is a nationalized product and Government fixes its rate thus Tendu leaves rate are one standard bag @ Rs. 4000 with bonuses purchased by Cooperative society and Tendu fruit rate was 20-25 Rs. per kg. in Dugli. The rate was below Rs. 20 for 9 NTFPs listed Sal seed, Harra, Baheda, Mahul leaves and kumbhi flower. The rate of Mango dry (fruit slice) 50 Rs. per kg, Char guthali 109 Rs. per kg, Charota seed 16 - 25 Rs. per kg, Dhawai Flower 32 Rs. per kg, Imli 25-30 Rs. per kg, Aonla 70 -120 Rs. per kg etc. in Dugli Market. Details are given in table No.7.

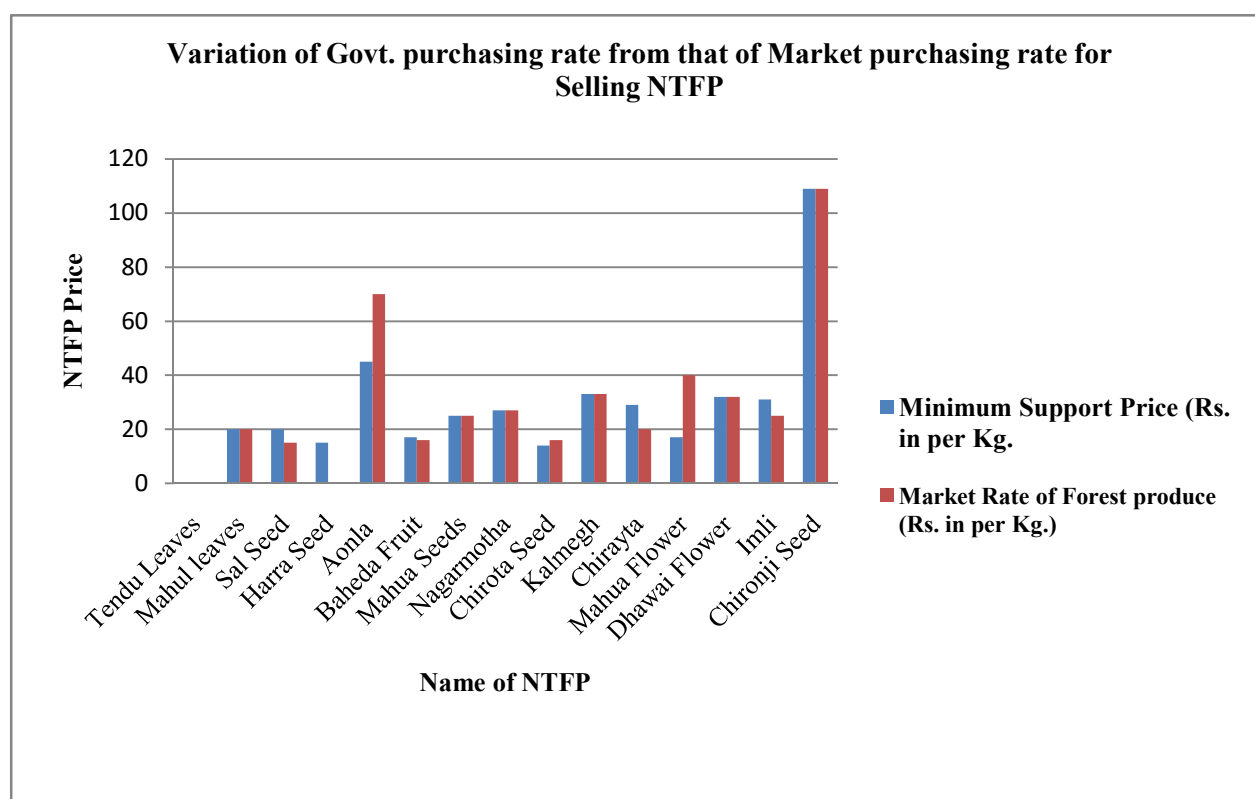
**Table No. 7: Variation of Govt. purchasing rate from that of Market purchasing rate for Selling NTFP: Dugali Market**

Name of NTFP	Minimum Support Price (Rs. in per Kg.)	Market Rate of Forest produces (Rs. in per Kg.)
Tendu Leaves	4000/- per Standard Bag	0
Mahul Leaves	20	20
Sal Seed	20	15
Harra Seed	15	0
Aonla	45	70
Baheda Fruit	17	16

Mahua Seeds	25	25
Nagarmotha	27	27
Chirota Seed	14	16
Kalmegh	33	33
Chirayta	29	20
Mahua Flower	17	40
Dhawai Flower	32	32
Imli	31	25
Chironji Seed	109	109

Source: District Union CGMFP Fed. Ltd. 2019

Botanical name are given in table No. 11



## Changes in temperature

The majority of the respondents concurred that there have seen changes in the temperature in the region. About 100% of respondent has been told they are realized expansion and change in temperature and monsoon pattern. Pattern investigation of the month-to-month temperature demonstrates an expansion in the temperature for as long as 5 to 8 years. Details are given in table No.8.

**Table No. 8: Climate Change related issues in Project Area**

S. No.	List of issue	No of respondent	Mahasamund (%)	No of respondent	Dhamtari (%)	No of respondent	Balodabazar (%)
1	Drought	11	35.48	25	100	26	86.66
2	Lack of Surface and Ground water availability	26	83.87	25	100	30	100
3	Reduced quality of forest produce	0	0	1	4.00	0	0
4	Increase in temperature	15	48.35	25	100	30	100
5	Reduced Availability of NTFP	8	25.81	23	92	0	0
6	Insect Problem	0	0	0	0	6	20
7	Increasing of Health Sickness	0	0	0	0	30	100

\*Data are based on multiple responses

## Rainfall changes around the study area

Most of the respondents agreed that they have seen changes in the rainfall patterns over previous years such as Uneven Weather/ Cloud/ Rain etc. They noticed a change not only in the total amount of rainfall pattern but also in the timing of the rains, coming either earlier or later than expected. In all this Project area, face the problem of uncertainty of rainfall and drought due to this type of climatic change rural people loss their livelihoods and low productivity of NTFPs.

## Impacts of Climate Change on availability of NTFPs and services

The results revealed that the respondents agreed that they have realized the decrease in water resources, which has affected the availability of wild vegetables and fruits NTFPs. At the time of survey majority of the respondents agreed and given useful suggestion for availability and enhancing of NTFPs in forest area like Promotion of Non Destructive Harvesting practices, Plantation, Construction of small Pond and Water Harvesting. Promotion of other livelihoods activities and adopt the advanced precaution majors for preventing the Forest Fire adopt through all these activities improved the Ecological and Environmental services. Details are given in table No.9.

Month wise availability of 18 selected NTFPs during survey. The findings revealed that out of 14 selected NTFPs is presented in the Table 11. 8 NTFPs were available in the month of April to June and the name of those products were mahua, char seed, tendu fruit, tendu leaves, emli, sal seed, lakh and bhelwa ect.

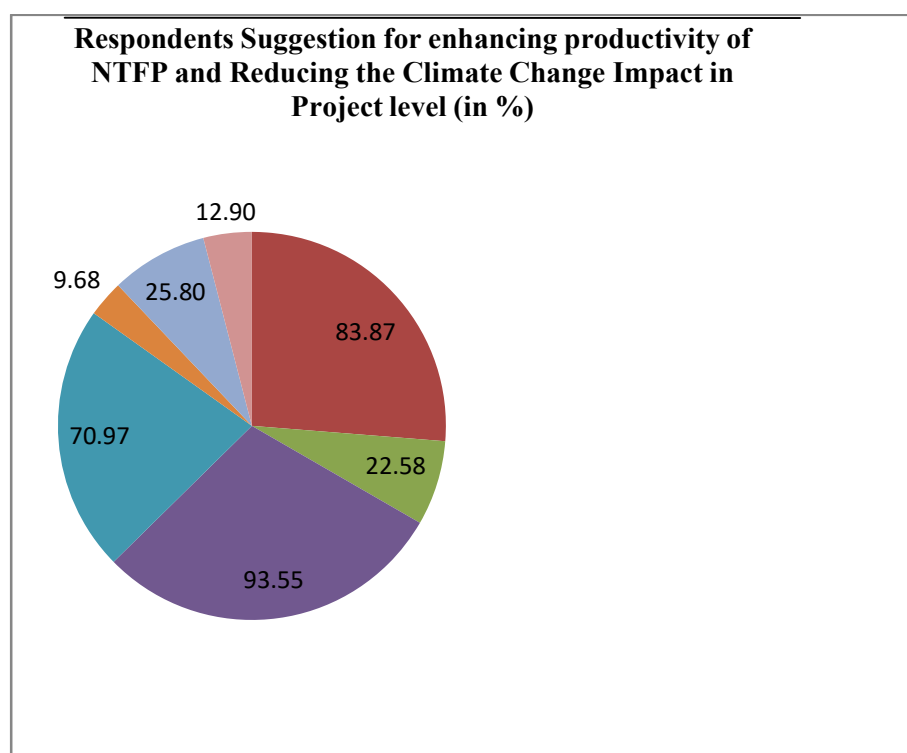
<b>Table no. 9: Suggestion for enhancing productivity of NTFP</b>	<b>Total no. of Respondent</b>
1. Plantation 2. Non- destructive Harvesting 3. Awareness creation at community level 4. Providing new opportunities for livelihoods by local departments and forest departments	13
1. Non- destructive Harvesting 2. Awareness creation at community level 3. Precautions for forest fire	3
1. Construction of Small Pond and water harvesting 2. Non- destructive Harvesting 3. Awareness creation at community level	4
1. Restricting people coming from outside the Village 2. Monitoring committee in the Village 3. The collection of NTFP should be done with the Non destruction system 4. Plantation of native Tree species	24
1. Artificial water bodies 2. Plantation work, Awareness creation at community level for Non Destructive NTFP harvesting method	25

#### **Respondent Suggestion for enhancing productivity of NTFPs and reducing the negative effect of Climate Change Impact:**

Respondent of the study area agreed that there is uncertainty of rainfall and droughts are being felt by the area, which is hampering their livelihoods and resulting in low productivity of NTFPs. People's perceptions for enhancing productivity of NTFPs and reducing the negative effects of Climate Change, about 83.87% of respondents were agreed to conservation of Forest and prevent the forest area from forest fire. Near about 94% of respondent wants to adopt and construction of Rain Water Harvesting structures like check dams, renovations of existing water storage and harvesting structures, for conserving soil moisture and promoting natural regeneration of valuable trees species. Details are given in table No.10



S.no.	Table no. 10 : Respondent Suggestion for enhancing productivity of NTFP	Total no. of Respondent (%)
1	Forest Conservation and Prevention from forest Fire	83.87
2	Water availability for the Wildlife inside the forest Plantation of trees	22.58
3	Storage of rain water Deepening of pond and Construction of dams or Check dams	93.55
4	Restricting Deforestation	70.97
5	Use Bio Fertilizer Plantation of fruit bearing tree species	9.68
6	Plantation valuable tree species and Provide good Market price (Govt. policies)	25.80
7	Construction of dams	12.90



**Table No. 11: Collection techniques of NTFPs used by local inhabitants (List of NTFPs)****Trees Species**

S. no.	Local name	Botanical name	Traditional Collection method	Use
1	Tendu Leaves & Tendu Fruit	<i>Diospyros melanoxylon</i>	Collected leaves were kept in sunlight for 3-4 days to dry. Fresh fruits are sold in market.	Bidi wrapper
2	Sal Seed	<i>Shorea robusta</i>	Surface fire used for collection of Sal seeds and sold in the market.	Sal seed cakes are used as feedstuffs, Sal oil which is used for Soap making, Vanaspati Ghee is prepared from Sal seed.
3	Kumbhi	<i>Careya arborea</i>	Flowers are collected from the forest then dried in shed and sold in market.	Medicine
4	Harra Seed	<i>Terminalia chebula</i>	Selected fruits spread in clean place to dry in sunlight for 4 -5 days and sold in market.	Medicine, This is a main ingredient of Triphala churn.
5	Aonla	<i>Emblica officinalis</i>	Collected fruits were boiled 10 - 15 min. for removing seeds. Then seeds are removed and kept for 4-5 days in sunlight for drying (for removing moisture)	Aurvedic Medicine, Jams, Jellies, Pickle and Candy etc.
6	Baheda Fruit	<i>Terminalia bellirica</i>	Unripe green fruits were also collected and Sometimes cut the branches for collection.	Triphala churn.
7	Imli	<i>Tamarindus indica</i>	Collected fruits were spread for 2-3 days in room then uncovered shed and sold in market.	Jellies, Pickle and Candy etc.
8	Char	<i>Buchanania lanzan</i>	People collected fruit from March-April when it is Immature. People used to cut its branches for collection of seeds	Roasted seeds are used as dry fruit. Seeds are used as condiment and to increase flavour in various sweets.
9	Mahua Flower	<i>Madhuca latifolia</i>	People put fire to clean floor below the tree, which may cause forest fire and Brooms should be used to clean floor. It is very easy practice.	Food material (laddu, kismis) and wine.

### Herbs Species

S. no.	Local name	Scientific name	Traditional Collection method	Use
1	Kalmegh	<i>Andrographis paniculata</i>	Collected leaves, fruits or whole plant were kept 2-3 days.	Medicine
2	Tikhur	<i>Curcuma angustifolia</i>	Rhizomes are collected and sold in market. Rhizomes are collected and cut it into small pieces and grind, Five to Ten-times rinsed in water, then dried in sunlight white solid powder is obtained as known as Tikhur.	Food material Barfi, Sweets.
3	Charota	<i>Cassia tora</i>	Its leaves were dried in sunlight for 2-3 days. The collected pods of charota are kept in sun light to crack the pods for easy separation of seeds.	Cassia tora in herbal tea, pure, natural and non-polluted green health beverage (coffee-tea), Substitute for coffee and Sodas.
4	Mushroom	Fungicidal	Collected Fresh mushroom used as vegetable and sold in market and some types of mushroom are sun dried for storage.	Use as a vegetable.

### Climber Species

S. no.	Local name	Scientific name	Traditional Collection method	Use
1	Mahul Leaves	<i>Bauhinia vahlii</i>	Collected leaves tied in bundles of 100 leaves. Collected leaves kept in closed room before selling.	Making Plates, Donas and Rope.

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## Conclusions:-

Production Trend of NTFPs in all three divisions is varies from local or geographical condition of the area. In Dhamtari forest division recorded numbers (19) NTFPs during the survey as compare to Mahasamund and Balodabazar forest division. In last four years trends of NTFPs collection is gradually change due to maimed or natural causes. During survey results revealed that, the respondents agreed that they have realized the decrease in water resources, which has affected the availability of wild vegetables and fruits NTFPs. At the time of survey majority of the respondents agreed and given useful suggestion for availability and enhancing of NTFPs in forest area like Promotion of Non Destructive Harvesting practices, Plantation, Construction of small Pond and Water Harvesting etc.

The majority of the respondents pointed out that they were facing the problem of low and fluctuated market price of NTFPs primarily followed by existence of bad weather and lack of developed market infrastructure for NTFPs (36.40%), deforestation (73.71%), over collection of NTFPs by outsiders (72.80%), lack of skill oriented training programme related to collection, processing and marketing of NTFPs (78.26%), forest fire (48.23%) and lack of low cost storage facilities during unfavorable conditions.

- The majority of NTFPs collectors are landless labour followed by marginal farmer and small farmer. The marginal farmer had 3.32 acre in the study area. During study a total of 13 types of NTFPs were collected by respondent. The contribution of NTFPs in household economy varied from average income Rs. 12000 to 25000.
- The percentage of women in NTFPs was recorded 60 % including child in all three study sites, mostly women involve in Mahua, Tendu leaves and Mahul patta collection.
- During household survey according to respondents 13 NTFPs species were informed and they belong to 08 trees, 3 herbs, 1 climber species and 1 fungicidal (Mushroom) products were collected, processing technique used and sold in the market as well as for their own use.
- The problem of deforestation is seen in Balodabazar whereas other two divisions are not facing this problem.
- Dhamatari is facing forest fire issue more than other surveyed divisions.
- Mahasamund is facing wild boar problem, frequently drought or ground water availability and less production of NTFPs.
- Destructive harvesting of NTFPs is being practices by the collectors in all three regions.
- Most of the respondent, about more than 93% respondents want to prepare water harvesting structure in Project area, about 70% respondents responded to restricting out siders who destruct the forest and they want to restrict deforestation.
- About 80% majorities of respondents want to prevent forest from forest fire.

**Recommendations:-**

Following recommendations were given by the respondents during the study -

- There is need to increase awareness on Climate Change and the issues related to improve the strategies to enhance the NTFP based adaptive capacity and livelihoods. The focus on sustainable harvesting, improve processing and access to NTFPs markets is the most important factor.
- There is scope to develop management plans for different NTFPs and processing unit establishment. Local stakeholders and communities should be sensitized to establish forest-based enterprises.
- Trainings on sustainable harvesting of NTFP is urgently required as very less people aware for Non - destructive NTFPs harvesting system and sustainable harvesting.
- Collection of NTFPs by outsiders in the Project Village should be restricted by making necessary arrangement in collection area.
- There is also scope for financial inclusion for local communities for affordable credit with low interest to increase their sale and flexibility to change production strategies and improve their earnings.
- Plantation or promotion of regeneration of NTFP species should be done time to time in the region.
- There is also scope to establish a NTFP processing unit for Villager's and Lac Cultivation at Mahasamund Forest Division Project area.
- Lac Cultivation can be done at Dhamtari Forest Division Project area with local community by providing Seed, training and Equipment support etc.
- In Balodabazar Forest Division Project area, Lac cultivation and Fodder cultivation for domestic animals at Village level can be explore to protect forest from over grazing.

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## References-

1. FAO (2005): The State of Food Insecurity in the World: Eradicating World Hunger Key to Achieving the Millennium Development Goals. Rome: FAO. <http://www.fao.org/3/a0200e/a0200e00.pdf> [assessed on date 26.08.2019]
2. FAO (1992): Forests, Trees and Food. FAO, Rome.
3. Planning Commission Report (2011): The Sub-Group- II on NTFP and their Sustainable Management in the 12th 5-Year Plan [http://planningcommission.gov.in/aboutus/committee/wrkgrp12/enf/wg\\_subntfp.pdf](http://planningcommission.gov.in/aboutus/committee/wrkgrp12/enf/wg_subntfp.pdf) [assessed on date 26.08.2019]
4. Background Analytical Study Forests, inclusive and sustainable economic growth and employment, <https://www.un.org/esa/forests/wp/content/uploads/2019/04/UNFF14BkgdStudy-SDG8-March2019.pdf> [assessed on date 27.08.2019]
5. FSI publish Report Year 2011
6. A.K. Pandey, Y.C. Tripathi and Ashwani Kumar, 2016. Non Timber Forest Products (NTFPs) for Sustained Livelihood: Challenges and Strategies. Research Journal of Forestry, 10: 1-7. <https://scialert.net/abstract/?doi=rjf.2016.1.7>
7. Non-timber Forest Products in Bardiya District of Nepal: Indigenous Use, Trade and Conservatio, <http://indiaenvironmentportal.org.in/files/Nontimber%20Forest%20Products%20in%20Bardiya%20District%20of%20Nepal.pdf> [assessed on date 27.08.2019]
8. Archana Mhaskey. 2019, Intern, Climate Change Chhattisgarh State Centre for Climate Change, Interim Report “Assessment of NTFP production with reference to Climate Change in three Forest Divisions of Chhattisgarh”
9. Zaman, E.Y et al. 2015. Non-Timber Forest Products (NTFPs) as Alternatives for Climate Change Mitigation and Adaptation in Nigeria. <https://www.ijser.org/researchpaper/Non-Timber-Forest-Products-NTFPs-as-Alternatives-for-Climate-Change-Mitigation-and-Adaptation-in-Nigeria.pdf>
10. Livelihood Dependency of Rural People Utilizing Non-Timber Forest Product (NTFPs) in a Moist Deciduous Forest Zone, West Bengal, India <http://www.journalijar.com/uploads/597IJAR-4192.pdf> [assessed on date 27.08.2019]
11. Documentation of non-timber forest products and medicinal plants available in Narayanpur forest area of Chhattisgarh, <http://www.chemijournal.com/archives/2018/vol6issue3/PartAM/6-3-295-742.pdf> [assessed on date 27.08.2019]
12. Non-timber forest products (NTFPs), small-scale logging and rural livelihoods [https://www.cifor.org/publications/corporate/cd-roms/bonn-proc/pdfs/papers/T2\\_FINAL\\_Ros-Tonen.pdf](https://www.cifor.org/publications/corporate/cd-roms/bonn-proc/pdfs/papers/T2_FINAL_Ros-Tonen.pdf) [assessed on date 27.08.2019]
13. [https://scholar.google.co.in/scholar?q=non+timber+forest+products&hl=en&as\\_sdt=0&as\\_vis=1&oi=scholar](https://scholar.google.co.in/scholar?q=non+timber+forest+products&hl=en&as_sdt=0&as_vis=1&oi=scholar)
14. <https://www.cifor.org/Publications/Corporate/FactSheet/ntfp.htm>
15. <https://www.cifor.org/Publications/Corporate/FactSheet/ntfp.htm>
16. <https://ntfp.org/>

**छत्तीसगढ़ राज्य जलवायु परिवर्तन केंद्र**  
(व्यक्तिक अध्ययन हेतु प्रपत्र)

सूचनादाता का नाम.....  
 पिता का नाम.....जाति .....वर्ग .....उम्र .....  
 .....वर्ष, ग्राम का नाम ..... ग्राम पंचायत का नाम .....पो. ऑ. ....  
 .....ब्लॉक..... जिला .....

**पारिवारिक जानकारी :-**

1. परिवार संबंधी निम्न जानकारी दें :-

क्र.	सदस्य का नाम	उम्र	शिक्षा	व्यवसाय	मुखिया से संबंध
1					
2					
3					
4					

2. घर में उपलब्ध वर्तमान संसाधनों की जानकारी :-

क्र.	संसाधन का नाम	संख्या
1		
2		
3		
4		

3. परिवार की वार्षिक आय :-

- i. कृषि से .....
- ii. पशुपालन से .....
- iii. वनोपज संग्रहण से .....
- iv. रोजगार / व्यापार से .....
- v. अन्य .....

4. परिवार की कुल वार्षिक आय .....

5. आप इस स्थान पर कितने साल से रह रहे हैं?

एक वर्ष से कम	1 से 19 वर्षों से	20 से 39 वर्षों से	40 वर्षों से अधिक	पीढ़ीगत
1	2	3	4	5

**वन आधारित प्रश्न :-**

1. क्या आपके ग्राम में वन क्षेत्र है ? हां/ नहीं
2. वनों का स्वामित्व किसका है – वन विभाग/ राजस्व विभाग
3. मुख्य प्रजातियों का नाम .....  
.....
4. वन की स्थिति – सघन/ विरल/ मध्यम/ झाड़ीनुमा
5. वनों का प्रबंधन कौन करता है ? .....  
.....
6. वनों से प्राप्त होने वाली वनोपज की जानकारी :-

क्र.	वनोपज का नाम	उपयोग	उपयोगी भाग	प्राप्त मात्रा	दर/ कि.	राशि	वन में उपलब्धता (कम/मध्यम/अधिक)
1							
2							

7. आपके परिवार के कितने सदस्य वनोपज संग्रहण का कार्य करते हैं?  
(i) एक, (ii) दो, (iii) तीन, (iv) चार, (v) सभी.....
8. क्या आपने वनोपज के विनाश विहीन विदोहन पर प्रशिक्षण प्राप्त किया है? हां/ नहीं
9. यदि हां, तो प्राप्त प्रशिक्षण का विवरण.....  
.....
10. क्या आप वनोपजों के संग्रहण का कोई तरीका अपनाते हैं ? हां/ नहीं (यदि हां, तो विवरण दें):-

क्र.	वनोपज का नाम	संग्रहण का तरीका	पुनरुत्पादन व्यवस्था
1			
2			

11. वनोपजों संग्रहण पश्चात वनोपज का भंडारण एवं रख-रखाव का कोई तरीका अपनाते हैं ? हां/ नहीं (यदि हां, तो विवरण दें):-

क्र.	वनोपज का नाम	वनोपज का भंडारण एवं रख-रखाव का तरीका (विस्तृत विवरण दें)	संग्रहण पश्चात कितने दिन तक वनोपज को भंडारीत कर रखते हैं
1			
2			

12. क्या वनोपज संग्रहण के दौरान जंगली जानवरों एवं संग्राहक के बीच कभी झड़प हुई है ? हां/ नहीं
13. यदि हां, तो विवरण दें .....  
.....



14. संग्रहण पश्चात वनोपजों को बेचने के पूर्व किसी प्रकार का प्रसंस्करण किया जाता है? हां/ नहीं (यदि हां, तो विवरण दें):—

वनोपज का नाम	प्रसंस्करण विधि				प्रसंस्करण से फायदा
	साफ—सफाई	बीज हटाना	सुखाना	अन्य	
1	2	3	4	5	6

15. आप संग्रहित वनोपजों को कहाँ, किसे और किस दर में बेचते हैं?

वनोपज का नाम	स्थानीय दुकान में	स्थानीय बाजार में व्यापारी/बीचोलियों को	शहरी बाजार में व्यापारी/बीचोलियों को	दर/ कि. (रु. में)
1	2	3	4	5

16. क्या विगत 30 वर्षों में वनोपज की उपलब्धता/उत्पादकता में परिवर्तन आया है :—

क्र.	वनोपज का नाम	वनोपज की उपलब्धता/उत्पादकता की जानकारी			
		30 वर्ष पूर्व	20 वर्ष पूर्व	10 वर्ष पूर्व	वर्तमान स्थिति
1					
2					

17. वनोपज की उपलब्धता/उत्पादनता में कमी की मुख्य कारण:—

मानव जनित कारण	प्राकृतिक कारण	अन्य कारण	वनोपजों की उपलब्धता बढ़ाने हेतु सुझाव

18. वनों में प्राकृतिक पुनरोत्पादन की क्या स्थिति है ? .....

19. वनोपज संग्रहण के अलावा वनों से होने वाले फायदे :—

(i) जलाऊ लकड़ी, (ii) इमारती लकड़ी, (iii) चराई हेतु, (iv) सामाजिक कार्यों हेतु, (v) अन्य .....

20. वन प्रबंधन, वनोपज प्रबंधन एवं वनोपज संग्रहण से संबंधित प्रमुख समस्याएं किस प्रकार की हैं?.....

21. इन समस्याओं निपटने हेतु आपका क्या सुझाव है :-.....  
 .....  
 .....

22. क्या आप जलवायु परिवर्तन से परिचित हैं? हां/ नहीं

23. यदि हां, तो इसका क्या अर्थ है?

a. ....

b. ....

24. जलवायु परिवर्तन का क्या कारण है?

a. ....

b. ....

25. आपके क्षेत्र में जलवायु परिवर्तन के कारण क्या समस्याएं आ रही हैं ?

a. ....

b. ....

26. उक्त समस्या से आप कैसे निपटते हैं?

क्र.	समस्या का नाम	वर्तमान में समस्याओं निपटने का तरीका

27. इन समस्याओं के स्थायी समाधान हेतु आपका क्या सुझाव है :-

a. ....

b. ....

साक्षात्कारकर्ता

नाम : .....

पदनाम : .....

दिनांक : .....

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## समूह चर्चा

ग्राम का नाम:— ..... ग्राम पंचायत का नाम:— .....

पो. ऑ.:— ..... ब्लॉक:— ..... जिला का नाम:— .....

1. क्या आपके ग्राम में वन क्षेत्र है ? हां/ नहीं
2. वनों का स्वामित्व किसका है — वन विभाग/ राजस्व विभाग
3. वनों में मुख्य कौन कौन सी प्रजातियों के वृक्ष पाये जाते हैं ?

क्र.	वृक्ष का नाम	प्राकृतिक पुनरुत्पादन की स्थिति
1		
2		

4. यहाँ किस प्रकार का वन उपलब्ध है?  
साल वन / सागोन वन / मिश्रित वन / अन्य .....
5. वन की स्थिति — सघन/ विरल/ मध्यम/ झाड़ीनुमा
6. वनों का प्रबंधन कौन करता है ? .....
7. क्या विगत 30 वर्षों में वनोपज की उपलब्धता/उत्पादकता में परिवर्तन आया है :—

क्र.	वनोपज का नाम	वनोपज की उपलब्धता/उत्पादकता की जानकारी			
		30 वर्ष पूर्व	20 वर्ष पूर्व	10 वर्ष पूर्व	वर्तमान स्थिति
1					
2					

8. वनोपज की उपलब्धता/उत्पादनता में कमी की मुख्य कारण:—

मानव जनित कारण	प्राकृतिक कारण	अन्य कारण	वनोपजों की उपलब्धता बढ़ाने हेतु सुझाव

9. वनोपजों की उपलब्धता बढ़ाने हेतु सुझाव

- a. ....
- b. ....

10. वनोपजों के संग्रहण के दौरान वनोपज संग्रहण का कोई तरीका अपनाते हैं ?

हां/ नहीं (यदि हां, तो विवरण दें):—

क्र.	वनोपज का नाम	संग्रहण का तरीका	पुनरुत्पादन व्यवस्था

11. क्या ग्राम / वन प्रबंधन समिति / वनोपज संग्राहक स्तर पर लोगो वनोपज के विनाश विहीन विदोहन पर प्रशिक्षण दिया गया है? हां/ नहीं

12. यदि हां, तो प्राप्त प्रशिक्षण का विवरण.....  
.....
13. क्या वनोपज संग्रहण के दौरान जंगली जानवरों एवं संग्राहक के बीच कभी झड़प हुई है ? हां/ नहीं
14. यदि हां, तो विवरण दें .....  
.....
15. वन प्रबंधन, वनोपज एवं वनोपज संग्रहण से संबंधित प्रमुख समस्याएं किस प्रकार की हैं?.....  
.....  
.....
16. इन समस्याओं निपटने हेतु आपका क्या सुझाव है :-.....  
.....  
.....
17. वन एवं वनोपजों संग्रहण/ प्रबंधन / रख-रखाव / देख-भाल आदि, विभागीय सहयोग हेतु सुझाव है :-.....
18. क्या आप जलवायु परिवर्तन से परिचित हैं? हां/ नहीं
19. यदि हां, तो इसका क्या अर्थ है?
- a. ....
- b. ....
20. जलवायु परिवर्तन का क्या कारण है?
- a. ....
- b. ....
21. आपके क्षेत्र में जलवायु परिवर्तन के कारण क्या समस्याएं आ रही हैं ?
- a. ....
- b. ....
22. उक्त समस्या से आप कैसे निपटते हैं?

क्र.	समस्या का नाम	वर्तमान में समस्याओं निपटने का तरीका

23. इन समस्याओं के स्थायी समाधान हेतु आपका क्या सुझाव है :-
- a. ....
- b. ....

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Photo Gallery



Group Discussion in Dhamtari Forest Division



Group Discussion in Balodabazar and Mahasamund Forest Divisions





**Personal Interview during the Study**



**NTFPs Collections by Villagers during study Season**





**Weekly market - Dugli**



**Weekly market - Dugli**



**Weekly market in Dugali, Dhamtari**



**Weekly market in Sirpur, Mahasamund,**